

**NARMADA CONTROL AUTHORITY**

*Environment Sub Group*

*Agenda and Minutes of Meetings*

**PART VI**

*39<sup>th</sup> to 51<sup>st</sup> Meeting of the Environment Sub-  
Group (ESG)*

*2003 to 2019*

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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**उनतालीसवीं बैठक की कार्यसूची**  
**Agenda for the 39<sup>th</sup> meeting**

स्थान : पर्यावरण भवन,  
नई दिल्ली

दिनांक : 26 दिसम्बर, 2003  
DATE : 26<sup>th</sup> Dec., 2003

Venue : Paryavaran Bhawan,  
New Delhi

समय : 11.30 बजे सुबह  
Time : 11.30 A.M.

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

इन्दौर  
दिसम्बर, 2003

**Indore**  
December, 2003

## ENVIRONMENT SUB-GROUP AGENDA FOR THE 38<sup>TH</sup> MEETING

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## ENVIRONMENT SUB-GROUP AGENDA FOR THE 39<sup>th</sup> MEETING

### Item No. XXXIX-1(180) : CONFIRMATION OF MINUTES OF THE 38<sup>th</sup> MEETING

Minutes of 38<sup>th</sup> Meeting of Environment Sub-Group of Narmada Control Authority were circulated to all Members and Invitees vide NCA Office letter No.Env-3(38) /2003 /1398-1437 dated 28<sup>th</sup> April, 2003.

Comments received from NHDC vide letter No. NHDC/1/N/0043 /3133 dated 8<sup>th</sup> May, 2003. SSNNL vide letter No.SSNNL/Env/ESG-38/507 dated 31<sup>st</sup> May, 2003, NVDA vide letter No NVDD/M(E&F)/2003/1070 dated 28<sup>th</sup> July 2003 received through MoEF letter No.3-87/80-IA-I dated 5<sup>th</sup> August, 2003, are placed at **Annex – XXXIX – (1 to 3)**. The points raised are summarized in the Table below:

<b>Observations by NHDC vide letter dated 8<sup>th</sup> May 2003</b>	
As recorded	Modification suggested
On page 10-11 : Table on project cost:	Expenditure is required to be restricted by NHDC within the approved RCE as per table enclosed
<b>Observations by SSNNL vide letter dated 31<sup>st</sup> May 2003</b>	
Item No XXXVIII-3(177) The Vice Chairman, SSNNL requested the Chairman that considering the substantial progress in almost all the areas request of the GoG for granting permission be granted	The Vice Chairman, SSNNL said that all the states having complied with all the environmental safeguard parameters pari-passu with the progress of works, up to 110m, the request of GoG for granting permission for environment clearance with that of R&R Sub-group, as the Hon'ble Supreme Court in the judgement also has directed to obtain the two clearances separately from the R&R Sub-group and the Environment Sub-group for further raising the dam height beyond 90m.
<b>Observations by NVDA vide letter dated 28<sup>th</sup> July, 2003</b>	
Item No.XXXVIII-5(179) Any Other Item third para "..... that MoWR holds the view that R&R as well as Environmental monitoring of ISP should be done by the NCA as stipulated in various clearances given to the project and statutory requirement of the Narmada Water Scheme. And in the second paragraph it is mentioned that "it was decided that the ISP would continue to be monitored by the ESG of the NCA as before.	Views of the GoMP intimated vide letter No.NVDA/NCA/2003/361 dated 6.3.2003 were not reflected in the minutes

Members may like to discuss and approve the minutes.

**Item No. XXXIX-2(181): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

**A. CONSTRUCTION SCHEDULE:**

**(a) SARDAR SAROVAR PROJECT:**

Works on the Sardar Sarovar Project resumed after the historic Judgement delivered by the Apex Court on 18.10.2000, in Civil Writ Petition No.319 of 1994 filed by Narmada Bachao Andolan (NBA) against the Sardar Sarovar Project (SSP). In accordance with the directions of the Hon'ble Supreme Court and the construction programme approved by the NCA, the Env.Sub-group during 38<sup>th</sup> meeting reviewed the compliances on implementation of the Environment Safeguard Measures commensurate with progressive filling of the reservoir up to EL 100m, 110m RL and beyond as reflected in the minutes of the 38<sup>th</sup> meeting of the ESG circulated to all members and invitees vide letter dated 28<sup>th</sup> April, 2003. Request is received from Managing Director, SSNNL addressed to Member (E&R). NCA vide letter No. SSNNL/Env/para-110/73/598 dated 17<sup>th</sup> June 2003 and from the Chairman, SSNNL addressed to the Secretary, Govt. of India, MoEF vide letter No. CS/SSNNL/Env.Clearance/2003/944 dated 13<sup>th</sup> October, 2003 received through MoEF letter No. 3-87/80-IA-I dated 20<sup>th</sup> October, 2003 for grant of permission for raising the dam height beyond 100m RL and up to 110.64m RL.

As per the approved construction programme of the SSP the height of the dam was to be 110.64m RL by the end of June, 2003. This is delayed due to various reasons. However, it is proposed to raise the dam to this level by the end of June, 2004. The resulting impoundment upstream of SSP would extend up to 141 km. from the dam site and the corresponding submergence will be about 11,500ha, out of a total of 37,533 ha. as could be ascertained from the area capacity curve of the SSP annexed with the project report.

To facilitate a review of the compliances on the conditions contained in the order of clearance and subsequent direction of the MoEF / Environment Sub-group, status of the implementation of the environment safeguard measures is presented below for consideration of the Sub-group

**B) Current Status of Implementation of the Environmental safeguard measures for the Sardar Sarovar Project is presented below for a review by the Members**

**(a) CATCHMENT AREA TREATMENT**

A phased CAT programme should be prepared and implemented ahead of reservoir filling.

- Project authorities were required to prepare the plans for Phase-I programme for treating those critically degraded sub-watersheds which were identified as directly draining into the reservoir. The implementation of the Phase-I plan would be pari-passu with the construction of the dam
- The balance sub-watersheds were to be treated as Phase-II programme for implementation in a time frame to be determined separately.

**PHASE-I PROGRAMME (1,79,180 ha.). (QUANTITATIVE)**

	Targets (ha.)		Achievements		Status of Compliance
	No. of Sub-water-sheds	Area(ha.)	No. of Sub-water-sheds	Area(ha.)	
Gujarat	15	29157	15	29157	Complied
Maharashtra	17	24298	17	23295	Complied
Madhya Pradesh 110.64	35	91668	35	90864	Almost Complied
Madhya Pradesh FRL	42	1,25,725	42	109345	

**PHASE-I PROGRAMME (QUALITATIVE)**

	Silt Monitoring Stations	Assessment through Remote Sensing
Govt., of Gujarat	Final Report awaited	Complied
Govt., of Maharashtra	Not initiated	Complied
Govt., of Madhya Pradesh	Agency yet to be finalised	Not initiated

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

An area of 13386 ha was diverted by MOEF vide it's order of 1987, with certain conditions. The main conditions were as follows:

- (a) For every hectare of forestland submerged or diverted for construction of the project there should be Compensatory afforestation on one hectare of non-forest land **plus** penal reforestation on two hectares of degraded forest.
- (b) For the 4,200.00 hectares of forestland in Maharashtra, which is to be used for R&R, an equal area of non-forest land or double the area of degraded forest should be planted.

	Targets (ha)	Achievements (ha)	Status of Compliance
Govt., of Gujarat	13,950	13,950	Completed
Govt., of Maharashtra			
(a) Submergence	19,378	19,378	Completed
(b) R&R	4,200	4197.5	Nearly completed
Govt., of Madhya Pradesh	8,737	8,737	Completed

### COMPENSATORY AFFORESTATION (QUALITATIVE)

	Studies on neo ecosystem	Success rate		Transfer to territorial forest divisions
<b>Gujarat</b> As per information given during the field visit on 19 <sup>th</sup> Dec 2001	Report awaited	survival %	Area	Reported to be completed but details of notification etc are not supplied
		Non Forest Area in Kuchchh.		
		> 50%	2327.1 ha	
		30to50%	1768 ha	
		below 30%	554.9 ha	
		Forest Area		
		Awaited	Awaited	
<b>Maharashtra</b> GOM letter 5 <sup>th</sup> July 1995 & 27 <sup>th</sup> Jan2003		In most of the areas survival > 50% as per information of 1995 and 2003		Reported to be completed but details of notification etc are supplied only for 5705.38 ha in Dhule circle
<b>Madhya Pradesh</b>  As per information vide NVDA letter No. 628 of 6 <sup>th</sup> April, 2002		survival %	Area	Out of the 2184 ha plantations on revenue land only 193.432ha has been notified as protected forest. Remaining area is under process of transfer at different stages in GoMP
		> 50%	5079.263 ha	
		30to50%	1068.263ha	
		below 30%	524.899ha	
		not reported	1726ha	
		fodder	339ha	

### (c) COMMAND AREA DEVELOPMENT AND DOWNSTREAM CONSIDERATION

The command area of the project is fixed based on the areas included by NWDT for purposes of considering requirement of Narmada water for irrigation. In Gujarat the GCA of the project is 3.43 million hectares of which Culturable command is estimated to be 2.12 million hectares. In Rajasthan for 0.30 million ha of GCA, Command Area Development Plan is required to be prepared and implemented commensurate with development of irrigation in the command area. Stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India required that

- (i) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and in the wasteland/vacant land under the control of the Irrigation Department
- (ii) A programme of drainage and ground water balance studies has been completed for Mahi Narmada-Doab. Such a programme must be completed for the areas beyond the Mahi. The Bhal, Saurashtra, Kutch, Sami-Harij and other areas require this as a pre-condition.
- (iii) The State should set up a special group of experts to study the siltation aspect in the main canals under all operating conditions since such siltation, if occurs, is likely to pose a serious problem during the actual operation of this project and may require a huge expenditure for desilting as well as result into serious operational difficulties.
- (iv) State should draw up a detailed time schedule for completion within five years the investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area of the total command of this project.
- (v) Past experience of Irrigation projects have revealed that main and branch canals are completed up to the end but, in absence of micro-level networks to take irrigation water up to outlet, corresponding Irrigation benefits do not start accruing in spite of huge financial investment made. To avoid this, the State should draw up an implementation schedule, segment wise, for completion of canal network, in such a way that a segment of the canal network, taken up from head reaches is completed in all respects so as to make the irrigation waters available, for the designed potential of that segment, up to the outlet in that particular segment.

With the attainment of height of 110.64m RL irrigation would be available for the Phase-I area of the command in Gujarat.

- o Command Area Development Plan for the Phase-I would be required.
- o Implementation of the water delivery and drainage system along with implementation of the measures proposed in the plan for safeguarding the environment would be required.
- o Downstream requirement for drinking, health, flora and fauna salinity ingress, breeding of fishes, water quality, etc., are required to be addressed.

Status of the Planning and Implementation aspects is presented below:

<b>Gujarat</b>	
Submission of the Plan	Submitted for Phase-I in Gujarat The command coming under Phase - 1 extends up to Narmada-Mahi Doab and areas coming under this belongs to agro-climatic zone no 1 to 4. Awaited for Phase-IIA and IIB in Gujarat Awaited for area in Rajasthan
Development of water delivery and drainage system	Construction of Canal Phase -1 Ch 0.00 Km to 144.500 Km (Mahi crossing) along with the distributaries have been completed in all respects. Construction works in the reach between kms., 144.500 and kms., 263.165 i.e., NMC Phase-II-A have been completed in all respect. The construction works in the canal reach between kms., 263.165 and kms., 388.164 i.e., NMC Phase-II-B are in advance stage of completion. Awaited Surface drainage is being provided up to 40 ha chaks concurrently with the construction of canals. The work of survey investigation, planning, designing and estimating up to 40 ha. (macro planning) for 52 blocks has been completed in Phase-I. The work of survey, investigation, planning designing and estimating below 40 ha. (micro planning) for 52 blocks (excluding the four blocks falling under Bara tract) has been completed. Total 204 distributaries having length of 1166 km. and 1635 minors having length of 4766 km. have been planned under the area of 52 blocks. Out of these, total 819 km. length of distributaries and 1419 km. length of minors have been completed up to June, 2003
Implementation of environment safeguard measures	Awaited.
Plantation along Canal Banks (15,000 ha.)	Plantations on 2,900 ha have already been established.
Downstream requirement	Awaited.
<b>Rajasthan</b>	
Initial plan was submitted during 1990	Sub-group directed for revision & EIA studies.
EIA studies	Completed by WAPCOS. Area to be irrigated was increased
Preparation of the Plan through ICCB	Progressing

During 38<sup>th</sup> meeting of the Sub-group, the Command Area Development plan for Phase-I, was submitted by the Govt., of Gujarat. This plan was circulated vide NCA letter dated 23.5.2003 to the Members of the Sub-group. Critical comments received were forwarded to the Govt., of Gujarat. Copy of the comments and the response received from the Govt., of Gujarat is placed at **Annexure XXXIX – (4-6)**. for a review by the Members.

**(d) FLORA, FAUNA, & CARRYING CAPACITY**

The guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora

and fauna present can be assessed, listed (rare and endangered) species can be detected, if present, and appropriate conservation measures devised.

A condition of this clearance, as far as it related specifically to the Flora & Fauna, was that the Narmada Control Authority would ensure in-depth studies on flora & fauna needed for implementation of Environmental Safeguard measures. The issues identified with respect to submergence area were identification of rare & endangered species, habitat sufficiency. Accordingly, the rehabilitation of flora fauna action plans were expected to cover the Surveys of flora & fauna in the region going to be affected due to implementation of the SSP with reference to the following

- 1) Gene pool, if any, likely to be affected.
- 2) Details of wildlife habitat in the region
- 3) Measures proposed to rehabilitate endangered species of flora fauna, if any.
- 4) Assessment of the carrying capacity of the neighbouring areas wherein the wildlife would dispose if the scheme were implemented.
- 5) Plan for rehabilitation of endangered flora & fauna.

#### Status of Implementation

Maharashtra Areas School of Environmental Sciences, University of Pune:		
	Recommendation	Status of implementation
1.	Management of corridors for shifting of wildlife, several corridors, passing through moderate to good (0>3) vegetation cover.	Due to thick vegetation growth resulting from the CAT programmes special management for the corridors was not considered essential. However, this is also considered under routine management by the state forest department
2.	Tree species with high diversity in the region (e.g. Buchanania lanzan) should be conserved on large scale, in the form of multi-region seed banks. Some of these seeds from each variety, should be planted in iso-climate regions, with care, if such regions fall in degraded areas.	Buffer zone plantation in 500 m width around the wetland area of the reservoir awaits implementation
3.	Seed bank status of soils of low-lying (e.g. valley bottoms) areas having found to be good hence; it is suggested that surface soils from such areas be used to develop vegetation (natural) in degraded areas	To be established with the help of Forest Protection Committees working in the remote tribal areas of the Satpuda ranges, voluntarily without any cost



4.	It is further suggested that these soils should be deposited, rather than spread thin at the end points of transformation, to facilitate diverse vegetation growth, comparable to natural vegetation.	<p>Catchment area treatment programme was implemented during 1992-1998 over forest area of 20283.48 ha. This man made forests was flourishing successfully</p>
5.	It will be futile exercise to concentrate on one or other methods for conservation of soil since there are various types of terrains. Therefore, it is necessary to go in for a combination of more than one method as locally feasible. Small storages of run-off water, should be aimed at	
6.	Based on the abundance of vegetation growth in different terrains such as vegetation along the crevices and slopes, suggestion is made to use these species with spreading habit which are already identified from this area could be effectively used for soil conservation and to develop microhabitats on difficult terrain. Such efforts will form a pioneer stages of secondary succession on distributed habitats, help to consolidate the substratum and pave the way for further regeneration on steep slopes and areas with poor soil cover.	
7.	Efforts should be made to encourage conservation of soil on slopes and crests and restore adequate soil cover on undulating grounds, through deposition of soil, restoration of degraded lands, formation and retention of plant cover and eventually improvement of water potential. Reciprocally supplementary phenomena of improvement of high diversity vegetation cover and soil potential should be exploited and encouraged through meticulous planning and its execution. This for ultimate aim of improvement of carrying capacity of the region.	
Gujarat Areas :		
1.	In order to protect our damaged ecosystems and to restore them to health it is necessary to undertake development programmes in rural areas, that regard natural watershed and all the communities in it as a unit, improve hydrological regime of the unit, institute rational land use planning, undertake reseedling programmes, and induce each unit of the state to solve its own problems rather than transfer its biotic load to other unit. Equally important steps are those of putting these areas on strong cash economy, training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state. Availability of trained manpower from these regions is likely to prove a boon to further economic development of the state and in its absence, either plans will be seriously flawed or the state and in its absence, either plans will be seriously flawed or the state will have to import trained people from outside while leaving its other citizens in poverty. An	<p>Entire catchment Over 30,000 ha area of Narmada river in Gujarat was treated up by soil moisture conservation measures. This included reforestation over 27204 ha area.</p> <p>In addition the area of Dhumkal sloth bear sanctuary was enlarged 4 times and now known as Shoolpaneshwar sanctuary. The sanctuary management plan was drawn up and was under implementation</p>

	independent monitoring and evaluating infrastructure is an absolute necessity for successful execution of these strategies and action plans.	
Madhya Pradesh Areas State Forest Research Institute, Jabalpur		
1.	Catchment protection work both engineering and biological coupled with shifted forest management. Reestablishment of indigenous forest ecosystem and local diversity.	The catchment area treatment plan covering 125725 ha area is under implementation. Areas treated by the end of September 2003 covered 64745 ha in non-forest land and 44600 ha in forest land.
2.	Production of fodder through agro-forestry or silvi-pastoral system through management of village wastelands.	
3.	Production of bamboo through agro-forestry.	Covered under CAT as well as under Social Forestry Programme.
4.	Using state-of-art technology for devising the management plans for the forests under study area with special reference to protection from fire and stringent control of grazing in the development area.	The working plans covering these issues were under implementation by the State Forest Department.
5.	Intensive campaign for forestry-cum-environment awareness, peoples participation backed by development legislation should also be launched.	Joint Forest Management & Social Forestry schemes are being run by the State Forest Department. These schemes have adequate involvement of local people. Peoples participation is sought while carrying out CAT works.
6.	To cater to increase requirement of timber, fuel-wood etc. Social forestry programme should simultaneously be launched.	Social Forestry programme is under consideration of the State Forest Department. Social Forestry Plan of Rs. 5.60crores has been approved by NVDA on 02-10-2003.
7.	Introduction of quick growing exotics in interest of soil stabilization and meeting the requirement of people in short time.	
8.	The area is stated comparatively scarce in wildlife with no species that was endemic but to provide alternate habitat for the wildlife two sanctuaries namely Mathwad (34659 sq. km.) in Jhabua district and Bokrata (3559 sq. km.) in Khargone district were proposed.	No action is taken so far.
9.	60 islands which will be found in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.	Recommendation would be taken up in time for implementation

10	Studies of the forests with particular reference to topography physical and chemical properties of the soil and soil moisture regime are necessary.	Not considered necessary by Govt. of Madhya Pradesh.
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### Aquatic Fauna Fisheries:

Requirement by MoEF / Sub-Group	Recommendation by CICFRI	Gujarat	Maharashtra	Madhya Pradesh
Gene pool, if any, likely to be affected.	8 species considered vulnerable	Plan included Measures for vulnerable species like Hilsa ilisha, Macrobrachium rosenbergii etc, taken	Revised plan awaited	Plan to be revised to include measures for vulnerable species like Mahaseer, Rita payementata etc
Details of wildlife habitat in the region	Breeding and places identified.	Existing plan included this aspect	Existing plan this aspect	Office of DD (F) established at Barwani, details of works awaited
Measures proposed to rehabilitate endangered species of flora fauna, if any.	Measures for rehabilitation of endangered fauna delineated	Hatcheries established & reservoir was being stocked	Revised plan awaited.	CICFRI was to be requested for inclusion of identified vulnerable species for developing rehabilitation methodology for those species it is yet not available. Results were to be included in the revised plan , it is awaited.
Assessment of the carrying capacity of the neighboring areas wherein the wildlife would disperse if the scheme were implemented	Certain studies on water quality, prey predator relation, carbon nitrogen ratio etc were suggested	Results of water quality studies upstream, downstream & estuary available with CICFRI & Pollution Control Board	Studies entrusted to CICFRI likely to be completed by Dec. 2003	Limnological studies were completed. Long term hydro biological monitoring was to cover, identified parameters for water quality monitoring. This is expected to be cover in the revised action plan.
Plan for rehabilitation of endangered flora & fauna.	Guidelines by the HLEG on the anvil	Existing plan to be revised	Existing plan to be revised	Existing plan to be revised

### Felling of the Forest from the submergence area

Felling plans for the forest area coming under submergence to avoid the possibility of animals being trapped in the submergence area, prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc. were required for the

areas in Gujarat, Maharashtra & Madhya Pradesh. However forest areas were required to be taken up for felling in a systematic manner to avoid even remote possibility of the same.

### Maharashtra

In Maharashtra the forest area of 6,488 ha was diverted for submergence of which 3,157.03 ha was forest. The balance area was under riverbed, nallah etc. Of this 2288.63 ha lied between 90 m & up to four meter below the FRL.

- In Akkalkua Taluka, the forest land affected at EL100m was 220.14 ha. out of this only 79.40 ha required felling, an area of 82.62ha also required felling in this Tehsil between RL100M & 110M.
- In Akrani Taluka, 3,173 trees of very poor quality required felling from the submergence area of 232.53 ha which has been completed, However, an area of 501.62ha is to be felled between 100m & 110m RL in this tehsil.

	Akkalkua Tehsil		Akrani Tehsil		Total		
	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Balance (ha)
Between 90-100 m	220.14	140.74	232.53	232.53	452.67	373.27	79.4
Between 100-110 m	239.72	157.10	515.73	14.11	755.45	171.21	584.24
Between 110-121 m	153.25	N.A.	460.05	N.A.	613.30	N.A.	NA
Between 121-34.68m	117.82	N.A.	349.39	N.A.	467.21	N.A.	NA= Not available

### Madhya Pradesh

Felling in entire forest area coming under submergence is completed except 23,318 trees in non-forest area up to FRL as shown below:

Districts	Forest Area			Non Forest Area		
	Total Trees	Trees Felled	Balance	Total Trees	Trees Felled	Balance
Jhabua	38,234	38234	Nil	3112	3112	Nil
Dhar	Nil	Nil	Nil	11,296	405	10,891
Badwani	14,771	14,771	Nil	16,530	4,103	12,427

### Gujarat

In Gujarat the forest area diverted was 4165.91 ha in addition 356.78 ha was diverted earlier. Thus in all 4522.69 was utilized for the SSP. Of this 4152.68 ha of the Distt. Vadodara and Bharuch required felling. The felling in Gujarat was reported to be complete and that even the coppice crop was also removed.

### (e) SEISMICITY AND RIM STABILITY

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. Although there are no specific stipulations on aspects of a seismic dam design in MOEF Clearance Order, however dam design in India is regulated by a national standard developed by the Bureau of Indian Standards (BIS). The BIS has classified the Indian sub-continent into 5 zones depending on tectonic, geologic and seismic consideration using available data. The Zonal classification is used to establish a set of Criteria for Earthquake Resistant Design of Structures whereby the appropriate conditions would be imposed on engineering structures falling into different zones. Engineering structures must be designed to withstand the maximum earthquake forces within a given category. The River Narmada lies in the seismo-tectonic provinces of Cambay Basin and Peninsular Shield (including the Deccan Trap) and comes under Zone 3 of the BIS classification.

Moderate seismic activity has been recorded in the Cambay Basin (up to 5.4 on the Richter scale) although the majority of seismic events in the dam vicinity have been of sub-zero magnitude. Rim stability refers to the competency of reservoir base rocks to maintain natural slopes and to contain the stored water. Under stable conditions, there should be no significant losses of reservoir water due to ground water percolation or seepage. Where rocks are found to be highly permeable, mitigation measures are needed to ensure the longevity of the reservoir.

The GOG appointed a Dam Review Panel, comprising engineers and geologists, to evaluate the report and findings and a revised final report was submitted to the project authorities in 1982. The main mitigation measures suggested were as follows :

- Construction of dams and Infrastructure (Incorporating seismic design coefficients) to withstand the maximum credible earthquake
- Establishment of seismic monitoring stations at key locations around the reservoir

ACTION	STATUS
Dam design modifications <ul style="list-style-type: none"> <li>▪ Adoption of horizontal design coefficient of 0.125g on the recommendation of the Dam Review Panel</li> <li>▪ Installation of stress monitors in the main body of the dam</li> <li>▪ Increase of the depth of the foundation to 18m below the lowest riverbed.</li> </ul>	Completed

▪ GSI (Nagpur Division) Rim Stability studies	Completed
▪ Tracer Studies by CWPRS	Completed
▪ Monitoring stations	Rim stability studies have been completed and well equipped 9 monitoring stations along with periphery of the reservoir 4 each on either side and one at the downstream of the Sardar Sarovar reservoir. Out of a total of 9 stations, 3 in M.P. (Alirajpur, Kukshi and Badwani, 1 in Maharashtra (Shahada) and 5 in Gujarat (Kewant, Naswadi, Kevadia, Jitgaon
▪ Results of analysis of data from monitoring stations.	Received, analysed by the dam safety review panel of the SSP during October, 2001.

Earlier it was considered desirable to upgrade the instruments for which a proposal was being worked out by the SSNNL in accordance with the suggestion of the IMD. Progress may please be presented. During the last meeting the issue was discussed and the necessity for constant recording and analysis of seismic data was stressed. The review of the data done by the Dam Safety Review Panel after October, 2001 may please be informed.

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, a specific requirement for the SSP contained in the environment clearance order of GOI was that, that the plans for the provision of health facilities to workers and residents of the affected areas should be prepared. Each State should take necessary measures to minimise the risk of malaria, filarial, schistosomiasis and other diseases associated with water that may result from implementation of the project. Preparation of an Action Plan for the surveillance and control of malaria was also stipulated.

As per the further directions received from the MoEF, the action plan was to cover the following issues. According to the recommendations of the committee of the experts on health after field visit under taken during August, 2001, the states were required to take up measures given in the table below.

	Mitigation measures	Gujarat	Maharashtra	Madhya Pradesh
1.	Present status of the waterborne disease in the areas	Completed		
2.	Screening arrangements proposed for the work force;	Completed	Not relevant	Not relevant
3.	Epidemiological Surveillance studies	Completed	Phase-II study yet to start	Completed
4.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases	Action plan under implementation	Revised Action plan awaited	Action plan revised Aug. 2003
5.	Reinforcement proposed to the existing health delivery system commensurate with height of 110.64 m RL.	Completed	Incomplete	Incomplete
6.	Surveillance of diseases	Progressing	Weak Being implemented under M.H.S.D.P. Use of computer to record and compile the data at district level	Weak
7.	Standard formats available with the NICD to be used for diseases surveillance purpose.	Progressing	Format circulated, implementation awaited.	Awaited
8.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	Progressing	Awaited, two water quality labs working, four being operationalised. Pada Workers are appointed to perform house to house disinfections with the help of Mediclor	Awaited
9.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.	Progressing	Awaited	Awaited
10.	Regular Entomological monitoring is suggested for alterations in ecology of the area due to irrigation / impoundment.	Progressing	Awaited, preventive measures planned.	Awaited
11.	It is suggested that sanitary latrines be established at the R&R sites and  Villagers may be educated to use these to keep the cases of Gastro diseases in check.	Progressing	Awaited  Health Department is performing IEC activities to educate the people.	Awaited
12.	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited	Awaited	Awaited

Also given in the table is the status of compliance on each of the key requirement for a review by the Sub-group.

**(g) ARCHAEOLOGY & ANTHROPOLOGY**

In addition the general obligations of the State under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out below.

- 1) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- 2) Plan for rehabilitation of monuments wherever necessary

In the case of SSP, where some sites may be submerged the NWDT award stipulated that, the entire cost of relocation and protection should be chargeable to GOG. Relocation work was to be supervised by the Department of Archaeology. As decided during the last meeting, a meeting was convened on 27.5.2003 under the Chairmanship of Secretary, Ministry of Environment & Forests, to resolve the issues related with archaeology and anthropology of the Sardar Sarovar Project. Minutes of this meeting was circulated vide letter No.Env-4(11)/2003/2108-2122 dated 5.8.2003 to all concerned. The current status of the protection / relocation works is presented below

		Gujarat	Maharashtra	Madhya Pradesh
Monuments	FRL	2 ( 2 completed)	Nil	23(4)
	Commensurate with 110.64			Approach roads likely to be impacted
Mounds	FRL	Nil	Nil	15(9)
	Commensurate with 110.64			Not likely to be impacted
Museums/Park	FRL			4 ( 1 completed)
	Commensurate with 110.64			Not relevant

Further progress on the issues discussed may be informed for a review by the Sub-group.



**(h) DOWN STREAM ENVIRONMENT**

The construction of dam would result into more regulated and perennial flow into the river with an overall beneficial impact. It is unlikely that any significant negative environmental impacts will occur over the next 30 years due to this project. Some possible adverse effects might manifest during raising the dam height further to 110.64m RL. The expected key impacts are outlined below for a review by the Sub-group.

- Period of progressive filling is required to be kept at the minimum for which release from the upstream reservoir has to be ensured at the appropriate time.
- While raising the blocks water level has to be lowered from its present level and while refilling, there would be time lag of 10 to 15 days depending upon the hydrology and timing of flow. Arrangements, therefore, have to be made for providing adequate supplies of water for downstream users and also to contain the salinity ingress up to the observed limits.
- Sudden release of water from the dam might catch some people unaware and they might be washed down and, therefore, arrangements have to be made for providing adequate sign boards at appropriate places and all necessary arrangements to warn the people.
- Arrangements would also be required to protect fishing in the deep pools downstream of the reservoir during these days to protect aquatic organisms taking shelter there.
- Control measures would be needed to contain mosquito breeding in small ditches that would be formed downstream of the reservoir during the period of filling.

Adequacy of the steps taken by the State Govts. towards compliance of the conditions / stipulations/ directions/ recommendations of the Sub-group may please be presented for a review by the Sub-group.

- C. Status of the implementation of the environment safeguard measures commensurate with raise in the height of the dam to 110.64m RL and consequent submergence / commencement of the irrigation is presented below for consideration of the Sub-group

To facilitate a review of the compliances on the conditions contained in the order or clearance and subsequent direction of the MoEF / Environment Sub-group, status of the suggested parameters is summarized below :

	Gujarat	Maharashtra	Madhya Pradesh					
<b>Catchment Area Treatment</b> Physical Targets	Completed	Completed	Total 35 watersheds enclosing treatable area of 91,668 ha were to be treated. Status upto 15 <sup>th</sup> July, 2003 was as follows : <table><tr><td>Targets</td><td>91,668 ha</td><td rowspan="2">99%</td></tr><tr><td>Achievements</td><td>90,864 ha</td></tr></table>	Targets	91,668 ha	99%	Achievements	90,864 ha
Targets	91,668 ha	99%						
Achievements	90,864 ha							
<b>Felling operations</b>	Completed	In Akkalkua out-standing from 90-110 m RL. (Area = 162 ha) In Akrani out-standing between 100-110m. (Area= 501.62 ha)	o Completed in forest area, outstanding in non-forest area.					
<b>Flora Fauna</b>	Progress on development of Sanctuary: Satisfactory	Implementation of the plan: Not initiated (subjective)	Approved plan awaited					
<b>Carrying Capacity</b>	Estimated for sanctuary being ensured through sanctuary development	Not estimated but being ensured through CAT & CAF	Not estimated but being ensured through CAT & CAF.					
<b>Fisheries Conservation Aspects</b>	Draft plan available. Implementation progressing .	Revised plan awaited	Revised plan awaited,					
<b>Downstream Environment</b>	To be ensured	Not relevant	Not relevant					
<b>Command Area Development</b>	Detailed plan on responsibilities, schedule, budget etc for Implementation of the planned measures for development of irrigation, conjunctive use etc. and Environment safeguards awaited	Not relevant	Not relevant					
<b>Health</b>	Satisfactory	Revised plan awaited. Phase-II Studies yet to be initiated, Revised details on Measures specific to impacted area awaited	Plan ready Implementation progressing with a slow pace.					
<b>Seismicity &amp; Rim Stability</b>	Data collection and analysis to be ensured..	Data collection and analysis to be ensured.	Data collection and analysis to be ensured.					
<b>Archaeology</b>	Completed	Not required	Area of concern timely works to be ensured at Roligaon and Chhoti Kasrawad and other locations for approach roads.					

In view of the above, members may like to discuss & consider the request of the Govt. of Gujarat regarding grant of permission to raise the dam height.

**Item No. XXXIX-2(182): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES INDIRA SAGAR PROJECT :**

**A. CONSTRUCTION SCHEDULE:**

Indira Sagar Project (ISP) formerly known as Narmada Sagar Project has an installed capacity of 1000 MW and annual irrigation of 1.69 lacs ha. The project is very crucial due to regulated releases of 8.12 MAF of water for SSP.

After getting necessary clearances the construction works were started in May, 1992 and the dam was targeted to be completed by June, 2000. However, due to various reasons the progress lagged behind. Subsequently, the work was handed over to Narmada Hydroelectric Development Corp. (NHDC), a Joint Venture of Govt., of Madhya Pradesh and National Hydro Power Corporation. The targeted date of completion has been revised to May 2005. As per available information the concreting was completed up to minimum 225mRL in the central overflow portion whereas non overflow side blocks were raised up to RL 267mRL. According to the schedule of construction, concreting is to be completed up to RL 245.13m by January, 2004, in the overflow portion. Accordingly the ISP would submerge an area of 91,000 ha. by December 2004 and consequently would impact the land, Flora and fauna etc.

Month / year	Level in m	Submergence area in ha.	% in relation to FRL
level as on March, 03	225	3696	4.06
January, 2004	245.13	28,600	31.43
December, 2004	MRL	91,000	100

**B) Current Status of Implementation of the Environmental safeguard measures for the Indira Sagar Project is presented below for a review by the Members**

**(a) CATCHMENT AREA TREATMENT**

A phased CAT programme should be prepared and implemented ahead of reservoir filling. Requirement for compliances was same as brought out under Sardar Sarovar Project.

**1. PHASED CATCHMENT AREA TREATMENT (Area in Ha.)**

	Duration in years	Fund requirement in Rs Crores	Non-forest	Forestland	Total area	Cumulative progress
Phase-I	10		51,927	11,048	62,975	54,920
Phase-II	30	1038	806720	108430	9,15,150	18542

Members may like to discuss & review.

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

Ministry of Environment and Forest vide letter No. 8-646-84-FC Dated the 7<sup>th</sup> Oct. 1987 permitted diversion of 41111.97 hectares of forest land in Khandwa, Dewas and Hoshangabad districts for the Narmada Sagar Multipurpose Project. under Section 2 of the Forest (Conservation), Act, 1980, subject to the following key conditions that

1. Compensatory afforestation will be carried out over suitable degraded forest land double the diverted forest area in extent and in addition to the equivalent area in non-forest land. However subsequently the scheme for compensatory afforestation submitted vide letter Nos. F.D /AAA/ AO/3 dated 13.11.1987, as detailed below was approved by the MOEF . However additional compensatory afforestation over 150 ha. degraded forest was directed.
2. The areas will be surveyed, demarcated and declared protected forests and placed under the control of the Forest Department for compensatory afforestation at the cost of the project. Areas not found suitable will be substituted by suitable area.
3. Forest clearance was to be done only upto 4 M below FRL

District	Area in hectares diverted for ISP	CA in Degraded Forest	CA in non forest area	Total
Khandwa	33,383	30,572	2,314	32886
Dewas	4,528	17,491	802	18293
Hoshangabad	3,678	22,739	2,842	25581
Sehore		-	1,247	1,247
Dhar		-	1,001	1,001
Khargone		-	1,937	1,937
Total	41,589	70,802	10,143	80,945

Progress (in ha) as on Oct 2003 Forest=70,022; Non Forest=10,337; Total=80359

(c) **COMMAND AREA DEVELOPMENT AND DOWNSTREAM CONSIDERATION**

The project on completion will provide annual irrigation to 1.69 lakh ha. The Command area comprises Forest:10,055ha; Grasses and pastures:10,498ha; Cultivated land: 142,406ha; Culturable fallow : 8,116 ha; Barren:18,385 ha. As per direction of the Planning Commission, project proposals are required to include the command area development plan also. MoEF clearance of 1987 also required it. The forest clearance stipulated that tree planting should also be done on either side of canal road and foreshore of the reservoir and in the wasteland / vacant lands under the control of the Irrigation Department in the command area. The key conditions attached with the investment clearance were as follows.

- The State shall comply with the conditions as laid down in the O.M.No.3-87/80-IA dated 24.6.1987 and letter No.8/646/84-FC dated 7.10.1987 both issued by the Ministry of Environment and Forest while according the environmental clearance and the approval for diversion of forest lands for this project respectively for this project and ensure completion of Rehabilitation and Resettlement Plan in scheduled time with close monitoring as per requirements of Department of Environment and Forest.
- State will establish adequate network for ground water monitoring in the command within 2 years and the State should submit to Planning Commission the time frame for establishing such network with mile-stone achievements, duly vetted through Central Water Commission, for monitoring the same by Planning Commission
- State should draw up a detailed time schedule for completion within 5 years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area ( Not already submitted) of the total command of this project.
- The State should draw up an implementation schedule segment-wise for completion of canal network, in such a manner that a segment of the canal network, taken up from head reaches, is completed in all respect so as to make the irrigation water available, for the design potential of that segment upto the outlet in that particular segment;

The Government of Madhya Pradesh have submitted command area development plan, delineating the soil classifications and land irrigability in the Narmada Sagar Command Area showing the first three phases of irrigation development by area, the land irrigability map of the Narmada Sagar Command Area during 1986. Accordingly the

implementation of the plan was to be taken up in three phases for completion by December-2007. The subgroup directed updating of this plan in line with the plans being developed for the SSP in Gujarat and Rajasthan.

1. To revise and update this plan, GoMP have constituted a multi-disciplinary expert group. Two meetings were held and detailed draft TOR's have been drawn up by the committee. Further developments may please be presented
2. The study on impact of Agro chemicals, runoff from fields on surface & ground water quality in the command area was assigned to J.L. Agricultural University, Jabalpur. Results may please be presented
3. However the progress on the canal system is very slow. Earth work has been completed only in the first 28 kms of the main canal and mostly completed in another 13.25km length. Work for most of the distributaries is yet to be started. Progress may please be presented

NVDA may please present the updated progress on preparation and implementation of the Command area development plan for a review by the subgroup.

**(d) FLORA, FAUNA, & CARRYING CAPACITY**

The submergence of forestland will result in the creation of new and regenerated forest habitat, the establishment and improvement of wildlife sanctuaries, the greater availability of fresh water for irrigated forestry or for wildlife. The MOEF conditions for clearance, as far as they related specifically to the Flora & Fauna, were essentially the same as brought under Sardar Sarovar Project.

The objective of the suggested studies was to assess the environmental impacts as a result of the Narmada Sagar Complex, consisting of the three dams: the Narmada Sagar, Maheshwar and Omkareshwar, to ensure minimal adverse effects on wildlife as a result of the project development works. Studies were entrusted to Wildlife Institute of India, Deheradun, Friends of Nature Society, Bhopal, Limnological studies to the Universities (Jabalpur, Ujjain & Bhopal). These institutes carried out studies with a view to address the above concerns and recommended certain mitigation measures which included the following.

1. Key aquatic vertebrates species like **otter** was proposed to be restored and translocated. It was suggested to explore the possibility of capturing and translocation of impacted otters of Narmada Sagar into identified localities of the vacant niches in central Indian rivers.
2. Besides, a species restoration plan for **aquatic reptile (turtle)** was also suggested within the submergence zone and also in other stretches of the river with rocky structure and sandy banks.
3. The restoration program for **muggar crocodile** as being practised in other districts of M.P. was also suggested.
4. The studies of certain aspects of fisheries and reservoir sciences have been included in the Limnological studies being conducted by the three Universities of the State.
5. Since the topography in the reservoir area consists of rolling hills, the higher peaks to remain above the water surface level and constitute islands in the reservoir. In addition to these small islands, two large islands will be formed to the north and south of the Narmada River just upstream of the Indira Sagar Dam. These islands were required to be protected. As per suggestions of the Sub-group NVDA had presented a plan for protection which was required to be implemented
6. It was suggested that the severity of the impact resulting from direct and indirect losses could be minimised through restoration of some of the aquatic vertebrates and delineation of a substantial area of the contiguity forest which has similar conservation values that are being lost in submergence and to elevate its status to a protected area – a combination of a national park and sanctuary. Three new protected areas were proposed to mitigate the losses. This included Narmada National Park, Suryanmaya Sanctuary and Omkareshwar Sanctuary, as per details given below.

<b>Name of the Sanctuary/Park</b>	<b>Area in ha.</b>
Narmada National Park	47522
Suryamaya Sanctuary	16370
Omkareshwar Sanctuary	11996
<b>Total Area</b>	<b>75888</b>

As per information received from NVDA vide their letter dated 15.10.2003 necessary administrative formations viz. offices of Director, Omkareshwar National Park and Superintendents, Surmanya / Mandhata Wildlife Sanctuaries together with the necessary staff for day-to-day management of these protected areas to ensure protection to the wildlife taking shelter there, have been established.

A plan for felling was also required to ensure protection to wildlife. However, more than 15,000 ha. of the forest had already been clear felled till January 2003 impacting flora and fauna.

Considering the above, the Sub-group during 38<sup>th</sup> meeting held on 10.3.2003 requested GoMP to initiate the process immediately for implementation of the

recommendations within five months period, however, a proposal is yet to be put up to the State Cabinet for a consideration / decision.

Sub-group may like to discuss and review.

**(e) SEISMICITY AND RIM STABILITY**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. The MOEF conditions for clearance, as far as they related specifically to the Seismicity and rim stability , were essentially the same as brought under Sardar Sarovar Project.

The Narmada Sagar reservoir has a gross capacity of 12,200 million cubic meters, or about 9.9 million acre-feet, by far the largest-capacity reservoir planned in the Narmada River basin. Therefore the issues of Seismicity and the potential for reservoir-induced seismicity (RIS) were required to be attended as per recommendation of the dam safety review panel, Central Water and Power Research Station, (CWPRS) Pune and Indian Meteorological department (IMD), which suggested:

- To monitor seismicity during the pre and post-impoundment phases. Network of about five stations each be developed in the Narmada Sagar, Omkareshwar, and Maheshwar areas .
- To record the ground motion intensity and response of the dams for any significant earthquake in the vicinity, installation of three strong motion seismographs at each dam site.
- To record any significant ground motion that occurs during construction, one strong motion instrument near each dam site.

Accordingly, zone a network of 10 seismological observatories with sophisticated instruments was being established. It was proposed to monitor pre and post impoundment seismicity also at these seismic stations to help in assessing the adequacy of seismic parameters adopted for designs. The location of these seismic observatories was as under:

- |           |            |              |                     |              |
|-----------|------------|--------------|---------------------|--------------|
| 1. Bagli  | 2. Barwani | 3. Chhanera  | 4. Hirapur          | 5. Umrikheda |
| 6. Kannod | 7. Khandwa | 8. Maheshwar | 9. Narmada<br>Nagar | 10. Kothi    |



At present, in addition to one unit at Pandhana near Khandwa to monitor local activity in and around Pandhana, three experimental seismological stations have been established with the guidance of Central Water & Power Research Station, Pune, in the project area at Narmada Sagar, Omkareshwar and Maheshwar dam sites and the results are analysed by the Central Water & Power Research Station, Pune and IMD. Details may please be presented.

During the last meeting, it was observed that only Narmada Nagar and Khandwa observatory were fully functional and setting up of the sophisticated instruments at other observatories was making progress. Present position on installation of the instruments for making the recommended sites functional may please be presented, for a review by the Sub-group.

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, specific requirements for the ISP contained in the environment clearance order of GOI were essentially the same as brought out under the Sardar Sarovar Project

The Indira Sagar Project would create a 913 km<sup>2</sup> reservoir, a main canal of 332 km. and 1,820 km of distributaries. Surveys and investigation of the existing levels of health, information on specific diseases besides implementation of the planned measures in time were required in accordance with the order of clearance.

Three specific diseases namely Malaria, Schistosomiasis, and Filaria were studied and diseases like leishmaniasis, scabies, etc., were investigated. The geographical reconnaissance study, to identify the potential breeding sites of malaria vector, was suggested. Other key suggestions included

1. Measures to control schistosomiasis should include physical, chemical, and biological means. The biological mitigation measures would include the use of predator species that would eat the secondary host snails.
2. Since the Anopheline mosquito vector has the potential to proliferate in the reservoir, the large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Some experimental resistance of adult mosquitoes to commonly used biocides was noted under laboratory conditions. Thus

research to maintain effective biocides was to be continued on long term basis. Land leveling and land filling operations as well as appropriate vegetation clearing are being integrated. Control measures was to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites.

In pursuance the NVDA was required to update and revise plan on health aspect for ISP in addition for the geographical reconnaissance study. The salient features of the revised plan may please be presented for benefit of the Members.

Pre-revised plan included establishment of a 30 bedded hospital at Punasa and other facilities. One well equipped laboratory for long term hydro-biological monitoring has been established at Barwani. A medical unit with 20 bedded Hospital for workforce of ISP, besides one sub health center at Saralya was completed and the work on three Ayurvedic Hospitals at R&R sites was making progress. During 37<sup>th</sup> meeting of the Sub-group held on 8<sup>th</sup> February 2002, while discussing the field visit report of the experts on Health, it was requested by the NVDA to include an expert from the Department of Indian Systems of Medicines. The issue of adequacy of the diseases surveillance by the Ayurvedic Doctors as per allopathically designed system of surveillance by the NICD may be discussed.

#### **(g) ARCHAEOLOGY & ANTHROPOLOGY**

In addition the general obligations of the State under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out under the Sardar Sarovar Project

#### **Archaeological Aspects**

Investigations of the basin revealed that valley was rich in archaeciological belongings. A survey of the 254 villages for identification of the archaeological monuments falling within the submergence area was carried out by the State Department of Archaeology and Museum, Bhopal. The current status of monuments is as below.

- 254 villages surveyed for identification of Archaeological monuments coming under submergence.
- 8 Nos. of monuments have been identified which require relocation/ protection.
- 153 statues have already been collected and preserved at Museum at Dewas, Hoshangabad and Khandwa.

- Shiv Mandir Dharikotla has been relocated to Sarlaya R&R site  
Progress on implementation may please be presented.

Archaeological Survey of India has also resurveyed 167 villages for identification of the monuments of significance. Further progress may please be presented.

Archaeological Survey of India have prepared a plan for protection of monuments coming under the submergence of Narmada Sagar Complex area. According to this plan, the well situated in the midst of north bastion of Joga Fort, a centrally protected monument, will be fully submerged at FRL + 262.10 M. However, this will remain submerged for 2-3 months during monsoon when reservoir might be at FRL. As far as backwater effect is concerned, the temporary rise due to backwater will be about 0.60 M near well, above HFL. Archaeological Survey of India had prepared an estimate of Rs.1.50 crores for construction of a wall to protect the in-take well.

The issue was discussed separately in a meeting convened by the Secretary, MoEF, on 27.05.2003 in the presence of officials of GoMP, ASI and the NCA wherein it was agreed that GoMP would carryout the work through NHDC. Progress may please be presented for a review by the Sub-group.

#### **Anthropological aspects:**

The Narmada Valley can be divided into three physiographic units (1) Western Vindhyas (2) Narmada through West and South and (3) Western Satpuras. Some Indologists place the Narmada-Chambal civilisation of Malwa as a contemporary of Indus civilisation. Navada Toli is a site contemporary to Harappa where evidence of early farming villages were discovered. Findings of a hominoid skull from Hathnora indicated the possibilities of the existence of human bio-cultural remains within the basin. Excavation of the early historic mound in village Khedinama in Hoshangabad district was completed earlier during 1993-94. Ancient tools and artifacts were found. The entire area was scanned by the Anthropological Survey of India under Narmada Salvage Plan and some ancient tools have been found. NVDA has also planned to establish a Center on Religious and Cultural heritage of the Narmada Basin, initial discussions were held with the experts by the NVDA during the meeting convened for the purpose on 11<sup>th</sup> July 2003. Further progress may please be presented.

After detailed studies NVDA prepared a plan for excavation of five sites in District Dewas, Khandwa. Current status of excavation works on identified mounds is presented below:

EXCAVATION SITES	STATUS
Bijalpur Khurd, Khandwa	Completed
Chhalpa Kala, Khandwa	Progress is nil
Gajanpur, Dewas	Progress is nil
Nabalpura, Khandwa	Completed
Gannaur, Khandwa	Completed

During the last meeting, NVDA expressed difficulty in carrying out the works due to delay in grant of permission as well as the issues related with the responsibilities on excavation. The issue was discussed in the meeting convened by the Secretary, MoEF, specially for the purpose and it was agreed that necessary clearances would be given by the ASI upon receiving a request from the NVDA and that NVDA would expedite the work in time. Progress may please be presented.

Adequacy of the steps taken by the State Govts. towards compliance of the conditions / stipulations/ directions/ recommendations of the Sub-group may please be presented for a review by the Sub-group.

**Item No. XXXIX - 4 (183) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

**1. Phase-I Establishment of Silt Monitoring Stations.**

**Gujarat**

In pursuance to the recommendations of the Environment Sub-group for establishing silt monitoring stations to assess the efficacy of the treatment works Sardar Sarovar Narmada Nigam Ltd., decided to entrust this work to Central Soil & Water Conservation Research & Training Institute, Vasad. The present status of the studies may please be informed to the Sub-group.

Studies carried out by the Space Application Research Centre, Ahmedabad through satellite imaginary for the period 1985-86/ 1994/ showed that there was considerable improvement in the conditions of the catchment. It was suggested to update the studies. Accordingly Data pertaining to 2002 was got analysed and made available by the SSNNL. This is placed at **Annex.XXXIX – (7)** for a review by the Member

**Madhya Pradesh**

During the last meeting it was informed that Water and Land Management Institute (WALMI), Bhopal, has agreed to take up the work. A proposal in this respect was being drawn up. It was suggested that the studies carried out by the Space Application Research Centre, Ahmedabad through satellite imaginary for the areas in Gujarat may be replicated for the areas in Madhya Pradesh also. NVDA, however, vide their letter dated 15.10.03 informed that

- 1) That in place of getting the work on assessment of success of CAT plantations, done by the Space Application Research Centre, Ahmedabad, the assessment carried out by the FSI periodically can be used.
- 2) Since WALMI is not in a position to carry out the work NVDA is considering to entrust the work of silt monitoring to CWC.

Result of analysis of the above two be presented to the Sub-group for a review by the members.

## **Maharashtra**

Most of the catchment area under treatment in Maharashtra is forest. Studies for the areas treated carried out by the Forest Survey of India, Nagpur office, through satellite imagery for the period 1991-95-98, showed that there was considerable improvement in the conditions of the catchment. It was, however, suggested to update these studies. Progress may please be reported.

### **2. Phase-II Submission of Catchment Area Treatment Plans and implementation.**

As per the decision of the Govt. of India of July, 1992 State Govts. were required to submit schemes for treatment of critically degraded sub-watershed other than directly draining as Phase-II programme to the funding agencies for completion of work in a time frame to be determined separately. Available progress is presented below for updation by the concern states.

	Targets	Achievements
Govt., of Gujarat	Completed under Phase-I	Completed
Govt., of Maharashtra	77,568	14,904
Govt., of Madhya Pradesh	3,18,118 ha	35,312 ha

It was observed during the 35th meeting that due to decentralization of the funding components of the watershed management schemes and placement of funds at the disposal of the respective State Govts, needed steps should be taken for continued supports to the soil moisture conservation works as envisaged. Steps taken by the States of Maharashtra and Madhya Pradesh may please be reported. Availability of the funds, manpower and the annual plan of treatment and progress on implementation may please also be updated for a review by the members.

## **B. MONITORING WORKS IN MAHARASHTRA**

### **1. Funding of the works on implementation of action plans for mitigation of adverse impacts**

Govt. of Maharashtra representative have expressed difficulties in receiving funds from the Project Authorities for implementation of the environment safeguard like Health, Fisheries, Flora, Fauna, etc.

## 2. **Agency for Inter Departmental Coordination for effective implementation of the plans in time :**

A number of actions are required on part of the Govt., of Maharashtra on the issues related to drawing up of the action plan on Flora & Fauna aspects, issues related with felling of the trees of the forest areas likely to be submerged by raising the Sardar Sarovar Dam to EL 100m and beyond, follow-up of the recommendations of the Committee on health which visited the areas in Maharashtra, The issues related to Phase-II surveillance of the diseases pattern within the impact area of the SSP. However due to lack of participation and subsequent needed follow up of the discussions / Field Visits, undertaken for speeding up the works and for removing the bottlenecks focusing the issues on Govt., of Maharashtra was lagging behind. Further information is awaited from the Govts. of Maharashtra

Members may like to discuss & review.

### **C. SARDAR SAROVAR PROJECT : ENVIRONMENT MANAGEMENT**

#### **1. Publications**

During earlier meetings it was desired that good works being done by the Project Authorities are to be published . In response following publications have been brought out so far.

1. Birds of the Shoolpaneshwar Sanctuary and Narmada Catchment, Gujarat (India) by Dr. Sanat Chavan, published by Govt. of Gujarat.
2. Heritage Flourishing in Narmada Valley published by Govt. of Madhya Pradesh.
3. Narmada River Basin Development: Indira Sagar Project "Environment Management" Published by Narmada Control Authority
4. Environment Safeguard : Sardar Sarovar Project: Published by Narmada Control Authority
5. A comprehensive draft document titled "Sardar Sarovar Project : Environment Management" prepared by the experts in Narmada Control Authority was circulated to the Members of the Sub-group in November, 2000 for their views. The suggestions were received from Govt. of Gujarat. These have been incorporated. It is proposed to publish the above document.

During the past meetings. the Sub-group was informed by the state Govt (s) that thrust areas have been identified and that publication would be brought out soon. Progress on these aspects may please be presented by the State Govts.

## 2. Seminar / Workshops

During the 33rd meeting, the Sub-group desired that NCA should organise Seminar / Workshops on the "Thrust Areas of the Environmental Ameliorative Measures". Steps are being taken to organize the Seminar by, 2004.

### D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES

In order to frame yard sticks on the cost estimates of the water resources Projects, the Chairman of the Sub-group during earlier meeting desired compilation of the estimates and expenditure incurred on survey, studies and implementation of the suggested safeguard measures for the SSP / ISP. Accordingly, the information compiled is being presented below for a review by the Sub-group.

#### 1. Indira Sagar Project

The cost of Project was Rs.1392.85 crores at 1983-84 price level. The cost was revised to Rs.1993.67 crores at 1988 price level. To include environmental safeguard measures, the cost of the Project was estimated at Rs.2167.67 crores in 1989 which included Rs.125.00 crores for Catchment Area Treatment works and Rs.50.00 crores for Command Area Development works. After taking over of Unit-I and III by NHDC, the Project estimate is further revised to Rs.3867.20 crores during September, 2000.

Cost estimates of Environmental Safeguards Measures as received from GOMP/NHDC is presented below :

ENVIRONMENTSAFEGUARD MEASURES REVISED COST at SEPT'2000 Price Level.	ESTIMATES (Rs. In Crores)	EXPENDITURE (Rs. In Crores)
Compensatory Afforestation	118.03	103.03
CAT works (Forest + Non-Forest). + restoration of land in construction area.	45.27	32.81
Control of aquatic weeds in submergence area to provide improved habitat for aquatic life (Fisheries).	2.59	0.086
Establishment of fuel depots etc. to meet fuel requirement of labour force to prevent indiscriminate felling of trees	2.00	0.38
Relocation of monuments of archaeological significance	2.10	0.333
Public health measures to control spread of water bound diseases.	3.38	2.3839
Removal of stumps and roots before filling the reservoir for the purpose of pisciculture.	2.60	



Setting up of a National Park & two wild life sanctuaries as per MoEF directions for Conservation of Flora & Fauna.	130.56
Fisheries conservation and development	N.A.
Seimicity and Rim Stability	N.A.
<b>TOTAL</b>	

### Sardar Sarovar Project

Expenditure by project authorities as annexed with 38<sup>th</sup> Meeting of ESG held on 10<sup>th</sup> March 2003

#### i) Cost of Survey & Studies (in Rs. Lacs)

	GOG		GOM		GOMP		GOR/I		Total	
	Estimate	Exp.	Estimate	Exp.	Estimate	Exp.	Estimate	Exp.	Total Estim.	Total Exp.
CAF	4.52	4.52	5.29	5.29	2.44	2.44			12.25	12.25
CAT	8.77	8.77	7	7	3.28	2.8			19.05	18.57
F&F	101.84	80.47	38	16	20.33	20.2	15.27	15.27	175.44	131.94
Health	2.5	2.5	10	2.5	29.63	27.84			42.13	32.84
Arch./Anth.	1.3	0.6	N.A.		59	36.33			60.3	36.93
Seismicity	5.05	5.07	N.A.		23	12.5	1.98	1.98	30.03	19.55
CAD	11.25	11.25					N.A.		11.25	11.25
							Total (i)		350.45	263.33

#### ii) Cost of Implementation (in Rs. Lacs)

	GOG		GOM		GOMP		GOR/NCA		Total	
	Estimate	Exp.	Estimate	Exp.	Estimate	Exp.	Estimate	Exp.	Total Estim.	Total Exp.
CAF	1809.10	1722.82	2116.00	1650.27	1800.00	907.90			5725.10	4280.99
CAT	3509.00	2776.67	2894.67	2218.27	8835.05	4002.76			15238.72	8997.70
F&F	75.31	64.42	117.00	2335.26	NA				192.31	2399.68
FISH			102.10						102.10	-
HEALTH	3800.00	192.28	546.60	9.26	1354.63	521.20			5701.23	722.74
ARCHVANT	156.00	95.55			700.00	12.97			856.00	108.52
SEIS.	219.57	318.55							219.57	318.55
CAD	NA						NA			
							Total (ii)		28035.03	16828.18
							Total (i & ii)		28385.48	17091.51

N.A. Not available

Updating at the current price level of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project is requested from the Govts. of Gujarat, Madhya Pradesh and Maharashtra.

**E. FORMATION OF MULTI DISCIPLINARY COMMITTEE BY THE MOEF FOR APPRAISAL OF SURVEY AND STUDY REPORTS ON VARIOUS ENVIRONMENTAL ASPECTS OF SARDAR SAROVAR PROJECT,**

A Multi Disciplinary Committee had been constituted during October, 2001 by Ministry of Environment & Forests to examine the adequacy of existing reports and surveys as well as plans for mitigative steps and the implementation so far, and suggest any improvement on additional measures which in its opinion are required to supplement the existing plans under implementation. under the Chairmanship of Shri C.D. Thatte, Secretary General, ICID, New Delhi & Dr (Mrs.) Nalini Bhat, Director, MOEF, New Delhi as its Member Secretary.

The Committee met several times and also visited the field for verification that was verified. The draft report of the committee was compiled. The committee is expected to submit its report shortly.

This is for information of the members.

**Item No. XXXIX-5(184) : Any other item**

**Date and venue of the next meeting**

# ANNEXURE



नर्मदा हाइड्रोइलेक्ट्रिक डेवलपमेन्ट कॉर्पोरेशन लि.  
(एन.एच.पी.सी. एवं मध्यप्रदेश शासन का संयुक्त उपक्रम)  
NARMADA HYDROELECTRIC DEVELOPMENT CORPORATION LTD.  
(A JV of NHDC & GoMP)

NHDC	1	N	0	0	4	3	3	1	3	3
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08.05.2003

To,  
Member (Env. & Forests),  
NVDA, Narmada Bhawan,  
Tulsi Nagar,  
Bhopal.

Subject : Rectification in Minutes of Meeting of 38<sup>th</sup> Meeting of Environment  
Sub-Group of NCA.

Sir,

With reference to the above subject it to bring to your notice that the Expenditure/Statement against the cost estimates of Environment Safeguards Measures of Indira Sagar Project as mentioned at page 10 of the MOM of the 38<sup>th</sup> Meeting of the Environment Sub-Group of NCA does not tally with Revised Cost Estimate (RCE- Sept. 2000 PL) of Indira Sagar Project (X-Environment & Ecology). Copy of the relevant part of the RCE is enclosed for your perusal. The expenditure under the head X-Environment & Ecology is required to be restricted by NHDC within the approved RCE.

It is therefore requested that the required rectifications may please be sent to NCA with reference to their letter no. 1398-1437 dated 28.04.2003.

Thanking you,

Yours faithfully,

*[Signature]*  
General Manager (MMS)

Encls: As above.

Copy to:

✓ 1. Member (E&R), Narmada Control Authority, 116-BG Scheme No. 74-C,  
Vijay Nagar, Indore - 452 010 (M. P.)

## INDIRA SAGAR PROJECT UNIT - 1 DAM

## ABSTRACT OF COST - 'X' ENVIRONMENT

Amount (Rs. Lacs)														
S. NO.	PARTICULARS	COST BASED ON DEC. 1989 PRICE LEVEL				ACTUAL EXP UPTO JUL'00			BALANCE TO BE EXECUTED			REVISED COST EST. BASED ON SEPT'00 P.I.		DIFF (14-6)
		QTY	RATE	UNIT	AMT	QTY	RATE	AMT	QTY	RATE	AMT	QTY	AMT	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Compulsory afforestation	80000 ha			15263	70000 ha		10303			1500		11803	-3457
2	Restoration of land in construction area by filling grading etc to prevent further erosion	L.S.			29			2.77			10		12.77	-10.23
3	Control of aquatic weeds in submergence area to provide improved habitats for aquatic life (Fisheries)	L.S.			221			8.61			250		258.61	37.61
4	Establishment of fuel depots etc. to meet fuel requirement of labour force to prevent indiscriminate felling of trees	L.S.			200			38			162		200	0
5	Relocation of monuments of archeological significance				25.00			33.30			177.03		210.33	185.33
6	Public health measures to control spread of water bound diseases	L.S.			150			238.39			100		336.39	186.39
7	Removal of stumps and roots before filling the reservoir for the purpose of pisciculture	L.S.			100						260		260	160
8	Setting up of a National Park & two wild life sanctuary as per MOEF directions for Conservation of Flora and Fauna				25						13056		13056	13031
9	C.A.T works (Forest+Non-Forest)					44859 ha		3013.97	18116 ha		1500		4513.97	4513.97
	TOTAL				16010			13638.04			17016.03		30653.07	14643.07

1 Under Provision =	479
2 Over Provision =	-3,473
3 Escalation	92
3 New Provision =	17,545
Total	14,643.07

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**ANNEX - XXXIX (2)**

# **Sardar Sarovar Narmada Nigam Ltd.**

( A Wholly Owned Company of Govt. of Gujarat )



Block No. 12, 1st Floor, New Sachivalaya Complex,  
Gandhinagar-382010. Gujarat, India.  
Phone : 23530-37

Fax : 02712-23056.

SSNNL/Env/ESG-38/ 507  
May 31, 2003

To,  
Shri Suresh Chand  
Member (E&R)  
Narmada Control Authority  
Indore - 452 010

Sub: Minutes of 38<sup>th</sup> meeting of the Environment Sub group.

Ref: Your office letter no Env-3(38)/2002/1398-1437 dated 28.4.2003

Sir,

With reference to the letter cited above, it is observed that the submission made by the Vice Chairman, SSNNL in the 38<sup>th</sup> meeting of the ESG do not fully reflects his views in the minutes circulated. It is therefore suggested that the minutes under item no. XXXVIII-3(177) may please be amended as given below:

Item no XXXVIII-3(177): Sardar Sarovar Project: Review of the status of Environment Safeguard Measures (Page 18) which reads as under:

*"The Vice Chairman, SSNNL requested the Chairman that considering the substantial progress in almost all the areas request of the GOG for granting permission be granted"*

The above paragraph may please be amended as given below:

*"The Vice Chairman SSNNL said that all the states having complied with all the environmental safeguard parameters pari-passu with the progress of works, upto 110m, the request of GOG for granting permission for 110M be considered. He further requested not to tag up the permission for environment clearance with that of R&R sub group, as the Hon'ble Supreme Court in the judgment also has directed to obtain the two clearances separately from the R&R Sub group and the Environment Sub group for further raising the dam height beyond 90 mt."*

The above citation may please be appropriately substituted in lieu of the paragraph mentioned in the minutes.

With best regards,

Yours sincerely

(R.V. Asari)  
Chief Conservator of Forests  
SSNNL, Gandhinagar



No. 3-87/80-IA-I

**ANNEX – XXXIX – (3)**

भारत सरकार

पर्यावरण एवं वन मंत्रालय

GOVERNMENT OF INDIA

MINISTRY OF ENVIRONMENT &amp; FORESTS

Dated August 5, 2003

To

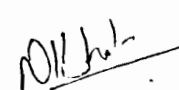
**Shri A. C. Gupta,**  
Executive Member,  
Narmada Control Authority,  
BG-79, Scheme No. 74-C,  
Vijay Nagar,  
**Indore,**

Sub : **Comments on the Minutes of the Environment Sub-Group Meeting of Narmada Control Authority.**

Sir,

I am enclosing a copy of the comments on the Minutes of the 38<sup>th</sup> Meeting of the Environment Sub-Group received from Shri Pradeep Bhargava, Principal Secretary, Narmada Valley Development Department. You may kindly like to analyse their observations and include the same in the Agenda for the next meeting.

Yours faithful,

  
( Nalini Bhat )

Director

Telefax :/2436 0478

Encl : As above



जहाँ है हरियाली।  
वहाँ है खुशहाली।।

पर्यावरण भवन, सी.जी.डी. कॉम्प्लेक्स, लोदी रोड, नई दिल्ली-1100 03 सूचना सुविधा केन्द्र फोन : 24361669  
PARYAVARAN BHAWAN, C.G.O. COMPLEX, LODHI ROAD, NEW DELHI-110003 website : <http://envfor.nic.in>



Speed 811863701 28/7/03

**NARMADA VALLEY DEVELOPMENT DEPARTMENT  
VALLABH BHAWAN; MANTRALAYA; BHOPAL.**

No. NVDD/M(E&F)/2003/1070

Bhopal, Date : 28/07/03

To,

Secretary to Govt. of India,  
Ministry of Environment & Forests,  
&  
Chairman,  
Environment Sub-Group of NCA,  
Paryavaran Bhawan, C.G.O. Complex,  
Lodhi Road, New Delhi.

Subject : Comments on the minutes recorded under Item No. XXXVIII-5(179): Any other item- Monitoring of ISP.

Ref. : NCA letter No. ENV-3(38)/2002/398-1437 dated 24.4.2003

Sir,

In the minutes of 38<sup>th</sup> meeting of ESG under item No. mentioned in the subject, it is reflected in the third paragraph that MoWR holds the view that R&R as well as Environmental monitoring of ISP should be done by the NCA as stipulated in various clearances given to the project and statutory requirement of the Narmada Water Scheme. And in the second paragraph it is mentioned that "it was decided that the ISP would continue to be monitored by the ESG of the NCA as before." In this respect it is to submit that the following views of GoMP have not been reflected in the minutes though they were intimated vide letter No. NVDA/NCA/2003/361 dated 6.3.2003 (photocopy enclosed)-

"2. Mainly the Ministry of Environment and Forests (MoEF) is concerned regarding monitoring of environmental aspects including R&R of the PAFs. The Union Ministry of Water Resources (MoWR) and the Planning Commission have only adopted the guidelines of MoEF in this regard. It may be recalled that when the projects were being cleared, it was the view of MoEF to set up a separate statutory authority for monitoring the implementation of environmental safeguard measures in depth and in its pace of implementation pari-passu with the progress on engineering works. NCA was entrusted with the work as an interim arrangement. Now that MoEF has agreed to workout separate mechanism for ISP, it is logical to take out this matter out of the purview of NCA."

"8. After the matter is decided by MoEF with regard to setting up of a separate mechanism for monitoring the R&R aspects of ISP, the Planning Commission and MoWR would automatically adopt the arrangement made in this regard."

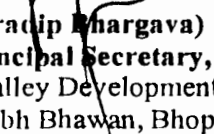
2. Main points to be noted are (a) NWDT Award is primary and Narmada Water Scheme came later, (b) amplification of terms of reference of R.R. Sub-group of NCA to include ISP (earlier it was for only SSP) was objected to by GoMP and after passing through the long channel of discussion it was decided in the 8<sup>th</sup> meeting of RCNCA that the Ministry of Environment & Forests would work out an alternative mechanism for

monitoring of the R&R aspect of ISP, and (c) the GoI, Ministry of Environment of Forests instead of evolving an alternative mechanism for the purpose started studying legal opinion through MoWR. With this context GoMP holds the view that an alternative mechanism remained to be evolved by GoI, MoE&F. The issue needs to be referred back to RCNCA, if GoI, MoE&F does not want to evolve an alternative mechanism. ||←

As stated earlier in the second para of our letter dated 6.3.2003 the NCA was entrusted with the work (of monitoring) as an interim arrangement and a permanent arrangement is expected to be made.

It is requested that the views of GoMP mentioned supra may kindly be included in the minutes at the time of confirming the minutes of the 38<sup>th</sup> meeting.

Encl : As above.

  
(Pradip Bhargava)  
Principal Secretary,  
Narmada Valley Development Deptt.,  
Vallabh Bhawan, Bhopal.

524  
(69)

**Government of Madhya Pradesh  
Narmada Valley Development Department,  
Mantralaya, Vallabh Bhawan, Bhopal**

No: NVDA/NCA/2003/... 361

Bhopal, dated 06/2/2003

To,

✓ **Secretary,**  
Government of India,  
Ministry of Water Resources  
and  
**Chairman,**  
Narmada Control Authority,  
Shram Shakti Bhawan,  
Rafi Marg, New Delhi.

- Sub:** Monitoring of Indira Sagar Project (previously known as Narmada Sagar Project) with respect to compliance of conditionalities imposed in the clearances (a) from environmental angle (b) for diversion of forest land for the project issued by GoI, MoE&F in 1987- need for making the monitoring independent of the Narmada Control Authority and representatives of other three States.
- Ref:** NCA letter No.Env.-3(38)/2002/3531-3533 dt. 24<sup>th</sup> June, 2002 which is also endorsed to GoI, MoWR.

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In the letter cited under reference above, the Narmada Control Authority has intimated that "The provisions contained in the Narmada Water Scheme were linked to the commitments made by the Govt. of Madhya Pradesh to the Planning Commission, Ministry of Environment & Forests & higher authorities; therefore, to effect the changes in the legal and administrative requirements pertaining to Indira Sagar Project, the Govt. of Madhya Pradesh might have to take-up this issue with the concerned authorities of the Planning Commission, Ministry of Environment & Forests & Ministry of Water Resources, until, amendments are brought out in the Scheme and clearances issued by the Government of India are re-worded with the approval of the Competent Authority, it would be imperative for the NCA and its sub-groups to carry out monitoring of the Indira Sagar Project."

2. In this connection it is pointed out that mainly the Ministry of Environment and Forests (MoEF) is concerned regarding monitoring of environmental aspects including R&R of the PAFs. The Union Ministry of Water Resources (MoWR) and the Planning Commission have only adopted the guidelines of MoEF in this regard. It may be recalled that when the projects were being cleared, it was the view of MoEF to set up a separate statutory authority for monitoring the implementation of environmental safeguard measures in depth and in its pace of implementation pari-passu with the progress on engineering works. NCA was entrusted with the work as an interim arrangement. Now that MoEF has agreed to workout separate mechanism for ISP, it is logical to take out this matter out of the purview of NCA.

3. On this subject kindly refer to the minutes of the 8<sup>th</sup> meeting of RCNCA held on 10.1.2001 wherein the view of Madhya Pradesh that the R&R Sub-Group of NCA

NCA's letter

6

constituted to monitor the R&R aspects of SSP should not, extend its jurisdiction to cover ISP also, was appreciated and the Union Minister of Environment and Forests agreed that his Ministry would work out a separate mechanism for monitoring of R&R aspects of ISP.

4. It was pointed out in the 8<sup>th</sup> meeting of RCNCA that Indira Sagar Project was not an Inter-State Project as the submergence of land and resettlement of PAPs was within the State. Therefore the R&R Sub-Group which includes representatives of other three States should not monitor the R&R aspects of ISP. In other words the Indira Sagar Project being the Project of Govt. of M.P., should be monitored by GoI at a forum independent of NCA (or its Sub-Groups) and the representatives of GoM/GoG/GoR. This is applicable to the monitoring of other Environmental aspects also. The basic principles and reasons which justified the stand of GoMP that the monitoring of R&R aspects of ISP does not lie within the purview of NCA or any of its Sub-Groups, also hold good for limiting the jurisdiction pertaining to the monitoring of environmental safeguard measures of ISP by NCA or its Environmental Sub-Group. This was brought to the notice of the Chairman, ESG in the 37<sup>th</sup> meeting held on 8-2-2002. The Chairman ESG agreed with the view of GoMP that it was not necessary for the NCA or its Sub-Group to monitor environmental safeguard measures of ISP and left out the consideration of items pertaining to monitoring of ISP.

5. It may be mentioned that the draft minutes of the Environment Sub-Group did not bring out the views expressed in the meeting and GoMP had already suggested to modify the minutes of the 37<sup>th</sup> meeting, vide letter No.MoE&F/638 dated 9.4.2002 addressed to the Union Secretary, MoE&F (which was annexed to the letter dated 3.5.02). It was also proposed in the meeting to constitute a monitoring committee for this purpose.

6. A meeting was thereafter held on 16<sup>th</sup> July, 2002 under the Chairmanship of the Union Secretary (E&F), to consider transfer of environmental clearance of Indira Sagar Project, M.P. in favour of Narmada Hydroelectric Development Corporation Limited (NHDC). As the minutes of this meeting (on 16.7.2002) also did not reflect correctly the deliberations in the meeting, in response to the comments sought by GoI, MoE&F on the minutes of this meeting, GoMP had already sent the same vide No. NVDD/MP/PS/02/1556 dated 26.8.02 (Photocopy enclosed).

7. It is pointed out that the Environmental Sub-Group is a Sub-Group of NCA & NCA is bound to follow RCNCA directives.

8. After the matter is decided by MoEF with regard to setting up of a separate mechanism for monitoring the R&R aspects of ISP, the Planning Commission and MoWR would automatically adopt the arrangement made in this regard.

Encl : As above.

(Pradip Bhargava)  
Principal Secretary  
GoMP, NVDD Bhopal.

5261

(67)

Endt.No.NVDA/NCA/2003/.....362

Bhopal,Dated 06-03-2003

Copy to :-

1. Secretary, GoI, MoE&F, Paryavaran Bhawan, C.G.O. Complex, Lodi Road, New Delhi.
2. The Secretary, Planning Commission, GoI, Yojana Bhavan, Parliament Street, New Delhi.
3. Member(E&R), Narmada Control Authority, 116-BG, Scheme No.74-C, Vijay Nagar, Indore-452 010.

(Pradip Bhargava)  
Principal Secretary  
GoMP,NVDD,Bhopal.

**NARMADA VALLEY DEVELOPMENT DEPARTMENT**  
 Joint Secretary



No. NVDD/ES/02...PSNVDD/MP/1556

Government of M.P.  
 Narmada Valley Development Department

Bhopal, Dated 26.8.02

527

(16)

To,

The Secretary,  
 Govt. of India,  
 Ministry of Environment & Forest,  
 Paryavaran Bhawan, C.G.C. Complex,  
 New Delhi.

Subject: Minutes of the meeting held on 16th July 2002 under the Chairmanship of Secretary (SEF) to consider transfer of environmental clearance of Indira Sagar Project, M.P. in favour of Narmada Hydro Electric Development Corporation (NHDC) Limited.

Re: Your letter No. J-12011/26/2001-IA-1, dated July 31, 2001.

-x-

Observations made by the Secretary to Govt. of India, Ministry of Environment & Forests have been indicated in the minutes that "he would review all the decisions taken on R&R aspects of ISP, and if required, consult Ministry of Water Resources/NCA to sort out the matter. He further stressed environmental matters would continue to be monitored by Environmental Sub-group of NCA as it is a concurrent subject".

2. In this connection we would like to mention that the following aspects may be kept in view while considering the matter. These were mentioned in the meeting but have not been included in the minutes:-

(i) The decision of RCNCA - In the 8th meeting of RCNCA held on 10.1.2001, the view of Madhya Pradesh that the R&R Sub-group of NCA should not, extend its jurisdiction to cover ISP also, was appreciated by the Union Minister of Law and Government. He agreed that his Ministry would work out a separate mechanism for handling of R&R aspects of ISP.

(ii) View point of Govt. of Madhya Pradesh - It was pointed out in the 8th meeting of RCNCA that Indira Sagar Project was not an Inter-State Project as the submergence of land and resettlement of PAPs was within the State. Therefore the R&R Sub-group which includes

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- 2 -

representatives of other three States should not monitor the R&R aspects of ISP. In other words the Indira Sagar Project being the project of Govt. of MP, should be monitored by GOI at a forum independent of NCA (or its Sub-groups) and the representatives of GOM/GOG/GOR. This is applicable to the monitoring of other environmental aspects also. The basic principles and reasons which justified the stand of GOMP that the monitoring of R&R aspects of ISP does not lie within the purview of NCA or any of its Sub-groups, also hold good for limiting the jurisdiction pertaining to the monitoring of environmental safeguard measures of ISP by NCA or its environmental Sub-group. This was brought to the notice of the Chairman, ESG in the 37th meeting held on . The Chairman ESG agreed with the view of GOMP that it was not necessary for the NCA or its Sub-group to monitor environmental safeguard measures of ISP and left out the consideration of items pertaining to monitoring of ISP. It may be mentioned that GOMP had already suggested to modify the minutes of the 37th meeting vide letter No. MOEF/638 dated 9.4.2002 addressed to the Union Secretary, MOEF. In this letter it was also proposed to constitute a monitoring committee for this purpose.

- (iii) Environmental Sub-group is a sub-group of NCA & NCA is bound to follow RCNCA directives.
- (iv) The transfer of Environmental Clearance to NIEL and proposed monitoring mechanism are two different issues and the latter one should not be linked with the former. (The Secretary (EGF) has already agreed to look into the matter).

It is requested to kindly bear in mind the above aspects while considering the issues.

Principal Secretary  
Narmada Valley Development Department  
Government of Madhya Pradesh, Bhopal.

**Narmada Valley Development Authority**  
**Narmada Bhavan, Tulsi Nagar Bhopal (M.P.)**

No. NVDA/For/Tech/2002 /737

Bhopal date 03-05-2002

To,  
 The Member (Env. & Reh.)  
 Narmada Control Authority and  
 Secretary Environment Sub-Group,  
 116 BG Scheme No.  
 74-C, Vijay Nagar, Indore 452010 (M.P.)

Subject - Minutes of the 37th meeting of ESG of NCA held on 8.2.2002  
 Reference.- Your letter No. Env-3(37)/2002/1267-1301 dated 13.3.2002  
 circulating the minutes.

Sir,

With reference to the letter cited above I am enclosing for your information a copy of our letter No.M(E&F) 638/dated 9.4.2002 written to the Union Secretary, Ministry of Environment and Forests on the basis of the deliberations in the 37th meeting of the Environment Sub Group (ESG) held on 8.2.2002, It is seen that the submissions made on behalf of GOMP and the acceptance of the same by the chairman ESG in the 37th meeting are not fully reflected in the minutes circulated vide letters under reference.

It is suggested that the minutes under items 3&4 and 5 may be amended as indicated below :-

Item	Page	As in the text	Modification Suggested
No.XXXVII-3(172)and XXXVII-4(173) Review of the status of Indira Sagar project and Review of action taken on the decisions of the previous meeting.	9	Last sentence on Page 9 However due to shortage of time detailed discussions were deferred.	Last sentence on page 9 of the minutes may be replaced by the following- However in view of the submission made by GOMP under Item No. XXXVII-5(174) which item was considered before these two items, the Chairman left out these items pertaining to the Indira Sagar project.



Item	Page	As in the text	Modification suggested
XXXVII-5(174) Monitoring of the Indira Sagar project	10	<p>Portion of the minutes on page 10</p> <p>-----</p> <p>He requested the Chairman to look into the matter. Vice Chairman SSNNL was of the view that decisions of the RCNCA where Hon'ble Minister for Environment and Foresty was present be taken up. The Chairman stated that the matter would be examined in the light of the decisions taken by the Review Committee of the Narmada Control Authority.</p>	<p>This portion of the minutes may be replaced by the following:-</p> <p>He submitted that the basic principles and reasons which justified the stand of GoMP that the monitoring of R&amp;R aspects of ISP does not lie within the purview of NCA or any of its sub-Groups, also hold good for limiting the jurisdiction pertaining to the monitoring of environmental safeguard measures of ISP by NCA or its Environment sub-Group. The Chairman ESG agreed with the view of GOMP that it was not necessary for the NCA or the ESG to monitor environmental safeguard measures of ISP and left out the items pertaining to monitoring of ISP.</p>

Encl - 1

Yours faithfully

  
 (PRADIP BHARGAVA)  
 VICE CHAIRMAN

End-1

**PRADIP BHARGAVA**  
Principal Secretary



No. 56 PS/NVDD/MP/

Government of M.P.  
Narmada Valley Development Department

M(RSP) 638

Bhopal, Dated 09/04/2002

To,

The Secretary  
Government of India,  
Ministry of Environment & Forests  
Paryavaran Bhavan  
C.G.O. Complex  
Lodhi Road  
NEW DELHI 110 003.

Sub :- Indira Sagar Project - a mechanism for  
monitoring of R&R and environmental safeguard  
measures.

With reference to the above subject/<sup>it</sup>is stated  
as under :-

1. In the 8th meeting of RCNCA held on 10.1.2001, the Hon'ble Union Minister for Environment and Forests agreed with the stand of GOMP that the R&R Sub-Group of NCA need not extend its jurisdiction to monitor R&R under the Indirasagar project (ISP). It was recorded in the minutes of the said meeting of RCNCA under item No 8(6) that "Union Minister of Environment & Forests stated that his Ministry would work out a mechanism for monitoring of R&R aspects of ISP". It is submitted that the basic principles and reasons indicated below, which justified the stand of GOMP that the monitoring of R&R aspects of the Indira Sagar Project does not lie within the purview of NCA or any of its sub groups, also hold good for limiting the jurisdiction pertaining to the monitoring of environmental safeguard measures of ISP by NCA or its Environment Sub-Group :-

...2

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- (i) Indira Sagar is not an inter-State project and naturally the other three States will have no interest in it.
- (ii) The duty of the NCA is to do any or all things necessary, sufficient and expedient for the implementation of the order of the NWDT. As the NWDT has not given any orders regarding the environmental safeguard measures of ISP (NSP), there is no question of monitoring its implementation by the Environment sub-group of NCA or the NCA in presence of the representatives of other three States.

This issue was raised by the Principal Secretary, GOMP, Narmada valley Development Department in the 38th meeting of the Environment sub-group held on 8th February, 2002 in Paryavaran Bhawan and the then Chairman of the sub-group agreed with the view that it was not necessary for the NCA or the Environment Sub-Group to monitor environmental safeguard measures of ISP, and left out the items pertaining<sup>to</sup> monitoring of Indira Sagar Project.

2. Though the approval of both the Narmada Sagar Project (now known as Indira Sagar Project, ISP) and the joint Sardar Sarovar Project, from environmental angle, was issued vide GOI, MOE&F office memorandum No. 3-87-IA dated 24.6.1987, the status of ISP & SSP basically remains to be that of intra-State & inter-State projects respectively.
3. Since GOI, MOE&F is going to work out a mechanism for monitoring of R&R aspect of ISP, independent of NCA, it would be helpful if monitoring of the environment safeguard measures is also included in the above mechanism. It is suggested that a Regional Committee of following officers may be

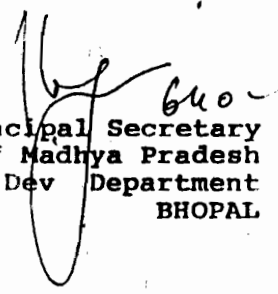
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3

constituted to monitor the various issues linked with the planning & implementation of R&R and environmental safeguard measures of Indira Sagar Project :-

- 1 Head of the Regional Office of the Ministry of Environment & Forests at Bhopal-Chairman and Convenor
- 2 Member E&F NVDA or his representative  
-Member
- 3 Member Rehabilitation & Resettlement NVDA or his representative - Member
- 4 Managing Director Narmada Hydroelectric Development Corporation or his representative  
-Member

The above committee being nearer to the work sites can have close watch on the project. The committee will provide reports to the State Government & the Central Government for actions at their end.

  
Principal Secretary  
Govt of Madhya Pradesh  
Narmada Valley Dev Department  
BHOPAL



# Samya - Centre for Equity Studies

*Handwritten signature/initials*

15 July, 2003

Dear Shri Misra,

*JSUR*

A copy of the Integrated Command Area Development Plan (Phase I) for the Sardar Sarovar Project was circulated by the NCA to members of the NCA Subgroup on the Environment, vide their letter of 23 May, 2003. I enclose some preliminary comments on the plan, for consideration of your Ministry and the Subgroup.

Considering the critical importance of a CAD plan and the advanced state of the Sardar Sarovar Project, I think it is important to subject this plan to a thorough scrutiny by concerned experts and institutions. I also think that at this late stage the complete CAD plan should have been submitted and approved before any request was made for further increase in the height of the dam. What we have at present is a plan covering only a small part of the command area.

I do hope you would request the concerned authorities to respond to the points I have raised well before the next meeting of the subgroup, so that their responses can be duly considered.

With regards,

Yours sincerely,

*Handwritten signature of Shekhar Singh*

Shekhar Singh

Member, NCA Subgroup on the Environment

Shri K.C. Misra, IAS  
Chairman, NCA Subgroup on the Environment  
Secretary to the Government of India  
Ministry of Environment and Forests  
Paryavaran Bhawan  
CGO Complex, Lodhi Road  
New Delhi 110 003

Encl: aa

*Handwritten notes:*  
2899/18/2003  
17/7/03  
20/7/03

C 17A Munirka, New Delhi 110 067

Telefax: +91 (0)11 26178048, Email: shekharsingh@vsnl.com

**Comments on The Integrated Command Area Development Action Plan Phase I (Vol.-  
I) SSNNL: April 2003**

**Overall Comments**

This plan should have been made years ago. The plan is being made in April 2003 when the irrigation is said to have commenced last year (2002) in an areas of about 100,000 ha. It would be important to study what the impact of the delay would be.

While a large number of studies have been carried out (from time to time, spread over many years and not at the planning stage), some of the major recommendations of these studies are overlooked. (For example, that irrigation should be avoided in the so called "supercritical area of the command" – in Zone 7. See *Critical Zones in Narmada Command Report for Zone 7 Extended Bhal Region*)<sup>1</sup>. It would, therefore, be useful to get a comprehensive statement of the major recommendations of the earlier studies and their current status. Specifically, it is also not clear whether the recommendations made in the Wallingford Report (summary at annex 1) were actually acted upon. The SSNNL should give a detailed statement of the status of each recommendation.

Several of the recommendations of the study that call for review of the project design have been ignored and only mitigative measures are being talked about. (For eg. The WRI study on the *Impact of SSP Canal on Wild Ass* calls for cutting out one section of the canal totally – I think it is the Maliya Branch).

Chapter 7, relating to soil salinity and water logging, appears only to deal with the four regions of the command area between the Narmada River and the Mahi Doab. The larger remaining part of the command area, with nine regions (5 to 13), was studied by the CES Water Resources Development and Management Consultancy Private Limited, for the SSNNL. Their report, dated December 1992, states that a large proportion of the area under these nine regions would have TDS of over 3000 ppm and would, therefore, need special handling (p9.3-9.4). This CAD plan does not seem to have covered this large area and, as such is incomplete.

**Specific Comments**

1. On page 2/3 (bottom of 2 and top of three), it is said that this will be "*the first project in India to plan simultaneous implementation of surface waters delivery and rain water disposal system.*" Yet, every year from 1995 onwards, it has been reported that in the initial part of the command where the canal network is most advanced, in the monsoons there are large areas that suffer from waterlogging as the canals have cut off the drainage. This has resulted in large crop losses in these areas. This is a clear indication that the drainage network is *not* being built simultaneously. The actual status should be reported.
2. On the top of page four it says, "It is evident that very few projects in developing countries have so much data gathered on such a wide variety of subjects. The immediate task is to analyse and synthesise the results of the studies, identify mitigatory measures where necessary and plan monitoring activities for inclusion in

<sup>1</sup> I do not recollect the exact title, but it is something like this.

action plan, is a challenge." The analysing and synthesizing of results of the studies should have been done long ago and not at this late stage. As already mentioned, the impact of this delay ought to be determined.

3. Page 16 talks about change in the cropping pattern. Its assumptions seem to be quite at variance with the ground reality. One of the important likely developments is that large number of farmers will go for sugarcane. This is evident from large number of sugar factories that have come up or are planned in the area that is the first phase of command. These factories have come up all waiting for the SSP waters. Also, in the first phase, excess water is likely to be available. Despite this, sugar cane has not been mentioned on page 16. This needs to be explained.
4. Also, though tobacco is listed as a major crop in the command area, in *sardar Sarovar: Environmental Management*, (October 2000, NCA, page 95), it is not even mentioned in the CAD. This needs to be explained.
5. Similarly, there is no mention of tree crops and dry area crops in the CAD. These need also to be focussed on.
6. On page 20, the three classes of waters are set out. Class "C" – which is the excess water during the project build up is likely to cause serious problems by completely upsetting the very finely tuned, meticulously detailed, controlled water delivery that the project deems necessary to control the waterlogging and salinity problems, (See Water logging and Salinity section of the report.). Another problem will be that the use of these waters may be deemed by people to have created rights to this water for them. A more detailed and realistic plan is needed to meet with such eventualities.
7. Page 21 talks about services to be provided for removing surplus waters harmful to crops. This essentially is the provision of drainage. Bullet point "C" says that water pumped to control groundwater that is suitable quality and water recovered from surface drains would be utilised for irrigation. But what about water that is *not* of suitable quality? What about the highly saline waters? Elsewhere in the report (Page 22), there is mention of "disposal areas" but there is only a mention – no details are given. It should be pointed out that the problem of disposal of saline waters is one of the most vexed problems and even in irrigation systems that are a hundred years old (like Punjab) this is still a major issue. It is critical to get a detailed plan of how this water is going to be disposed of and assess it for its environmental and social impacts.
8. Page 23 mentions an overall irrigation efficiency of 65% which is unrealistically high. Has this been achieved in other similar projects. Details need to be provided, along with justifications.
9. Page 29, last but one para, says that the implementation of the action plan will go on *pari-passu* with the phase one irrigation area. Two issues – one raised in third point of Overall comments – what about certain aspects that require design changes and hence need to be implemented before the project commences. Second issue is whether on ground the work is going on *pari-passu* or not – this needs to be checked as there is doubt about this – see point 1 above.
10. Page 31 has the conclusion (Sec. 5.1 first line) – that "according to Studies conducted there will be no impacts on major fauna." This appears to be incorrect. For example, there is likely to be a huge impact on the wild ass, an endangered species. The various studies done on this aspect need to be summarised and their findings presented in support of this point.
11. Page 32 talks about livestock. One major possibility is that livestock would suffer as grazing land is likely to be lost over the years due to conversion to cultivation. Has this been assessed and planned for?

12. Page 48 talks about some of the areas that are at high risk of water logging and salinisation. In this page, as elsewhere in the report, the measures outlined to prevent these are very fine-tuned, elaborate, meticulous and needing huge coordination between large number of agencies. Page 48 says, "A very limited irrigation water allowance would be permitted. Groundwater extraction, and part mixing of saline water, improved water management and agricultural practices, leaching of surface salts by flooding the surplus spill waters of Narmada, salinity resistant agriculture and continuous careful monitoring of the groundwater table and salinity status through observation wells; piezometers etc. will constitute the multipronged strategy for tackling the problem areas." For one, it is unrealistic to expect such a strategy to work. One very crucial thing in making the strategy work is the full participation of the people and taking them into confidence, especially about the fact that their lands are at severe risk and that they will be given only very limited water supplies. *Has this been done and have the people been taken into confidence?*
13. Another important pointer of the workability of these measures is given in the report itself. On page 102, it says, "The phase I area will have plentiful amounts of water available during the first stage of project development, such that there will be little or no incentive for development of conjunctive use by individual farmers and "worst-case" conditions for waterlogging might prevail."
14. Page 49 once again asserts that the construction of drainage system is going on concurrently with canals. This assertion has already been questioned above. It needs an explanation.
15. Pages 55-60 describe the large number of detailed measure that will be required to prevent waterlogging and salinisation. The workability of these measures has already been questioned above. Another issue that comes up through these pages is that it is expected by the SSP that in the regions 1-4 (first phase of command), medium rivers like Dhadhar and other streams will form the main drains. Now, it is acknowledged that these are today only seasonal rivers. What will happen when these dry rivers / streams carry the load of saline drainage waters in the non-monsoon months? This will have serious impacts on the areas through which they pass. Has this been studied and assessed? If so, the findings need to be disseminated.
16. The issue of water quality in the command (page 102-) is dealt with most cursorily. It appears from this that there is no plan to deal with this issue adequately. A far more professional plan needs to be developed.
17. An important aspect in water quality is that contamination of the waters is expected in the command area due to fertiliser and pesticide residues, salinity, irrigation return flows, industrial discharge etc. This is outlined on Page 102 in "Issues". Then, at the bottom of the page, it is stated "Projected demand is based on prevailing population estimated and accepted per capita requirements after subtracting all assured supply alternatives". What this means is that the SSP will assume that the village will use all the water resources available to it for drinking and domestic and cattle water needs, and SSP will supply only additional water. But these very water resources of the village are likely to be degraded due to contamination resulting directly or indirectly from the project. Yet, there is no cognisance of this problem. This needs to be studied and added.
18. Under "Mitigation" (Page 103), it is stated that "The mitigation plan would include guaranteeing minimum flow in rivers...". While this is a welcome recognition, it should be pointed out there is not a single river or dam project in Gujarat where this principle has been accepted. (Including in SSP). Now to ensure minimum flows in rivers would mean re-designing the operation if not the structures of virtually every



river project in the state. How is this to be done? For example, the Action Plan expects that one of the medium rivers – Dhadhar – will play the most important role in drainage. One of the tributaries of Dhadhar is the Vishwamitri. On this river, near Baroda is a dam and reservoir – the Ajwa – which supplies water to the city. Due to this dam, the river is virtually dry below (including where it passes through the Baroda city). To now make sure that Vishwamitri will always have a minimum flow is a welcome step – but will mean re-writing the operating rules of the Ajwa reservoir and importantly, releasing water from it into the river in all the non-monsoon months. Will the Baroda Corporation, which is already crying that they are water deficient, allow this? This section needs to be re-examined and made realistic.

19. In the section on Planning (Page 103), the Action Plan proposes that there will be "restricted use of water until proper provisions have been made for transport, treatment and disposal of downstream discharges". Some of these measures are listed. It is totally unrealistic to expect that it will be possible to impose such a restriction. Perhaps the SSNL can give more details on how it proposes to achieve the stated objectives.
20. The section on groundwater contamination, under "Mitigation", (Page 105) states: "Mitigation of groundwater pollution necessarily involves corrective measures in regions of critical concern, in the form of fertiliser and chemical use plans. The project authorities would provide research for, and inputs into, the plans". First of all, it will be virtually impossible to impose / implement a fertiliser and pesticide use plan in such a large area. Secondly, it is clear from the wordings that such a plan does not exist and will be made in the future – whereas the irrigation has already started. This needs detailed explanation.
21. In the section on Agricultural Chemical Use (Page 106), there is a statement (last line) "Multiple cropping is not likely so that pest problem will be reduced". But in the irrigation plans there is repeated talk about how the cropping will change from a single crop to multiple cropping. This contradiction needs to be resolved and a coherent plan needs to be made.

### Findings of TATA-IWMI Research Project

The Tata-IWMI research team based at Anand, Gujarat has published results of a detailed survey of the first part of the SSP command area.<sup>2</sup> Their findings and conclusions:

- A. While Water Users Associations (WUAs) have been registered, few are actually functional and not many are prepared to collect water fees on behalf of SSP. None of the villages has built a distribution system; instead, thousands of diesel pumps are likely to get pressed into service to convey water through rubber pipes.
- B. One idea that is deeply ingrained in the minds of farmers is that SSP's need to supply water to them is greater and stronger than farmers' need to use the water.
- C. Farmers and management committee members [of the WUA] we met assigned no seriousness or urgency to SSP's insistence on the operating practises it intends to pursue....All in all, farmers and local notables take SSP and the government so lightly that they are totally nonchalant about SSP's new water policy...

<sup>2</sup> Shah Tushaar 2002, *Framing the Rules of the Game: Preparing for the first Irrigation season in the Sardar Sarovar Project*; IWMI-Tata, Anand. Available at [www.iwmi.org/iwmi-tata](http://www.iwmi.org/iwmi-tata)

D. The most difficult challenge in establishing SSP's rules of the game is in ensuring that its writ runs in the command area.

These finding point out to the great difficulties in implementing the detailed mitigatory plans prepared by the SSP which require lot of control on the water supply and other farmer practises.

Annex 1 Summary of recommended actions:  
Environmental Changes Downstream of Sardar  
Sarovar Dam: Report EX 2750: March 1993

Action	Time scale	Priority	Stakeholder	Approximate cost	Comments
1. Prepare plan to mitigate effects of surges from turbines	1 month	High	Local 1m	Rs 12 500	
<b>Short-term</b>					
3. Prepare and implement policy for monitoring and mitigating effects on fishermen	Ongoing	High	Local 3m per year	Rs 37 500yr <sup>-1</sup> plus direct costs	Direct costs include all costs of rehabilitation
4. Data collection and Workshop on fish ecology	2 years	High	Local 12m	Rs 150 000	Possibly met by redefining GICRA's tasks
5. Salinity monitoring at freshwater intake	Ongoing	High	Minimal	Minimal	
6. Study of flood risks, delineate flood zoning needed	8-10 months	Lower	Local 12m	Rs 150 000	
7. Monitor reservoir limnology to warn of poor quality releases	Ongoing	Lower	Local 1m per year	(Rs 12 500yr <sup>-1</sup> )	No additional cost if part of water limnological monitoring
8. Coordinated monitoring of water quality in river and estuary	Ongoing	High	Local 5m per year, Int 1m	Rs 75 000yr <sup>-1</sup> US\$ 9 000	Cost might be reduced by rationalising existing monitoring and using water quality probes
<b>Medium-term</b>					
9. Study of low flow hydrology and integration of items 12 to 16 below	3 months	High	Local 4m Int 1m	Rs 80 000 US\$ 18 000	To be undertaken once Stage 2 operating policy for SSP established
10. Reconnaissance study of domestic water supplies close to river	2 months	Lower	Local 3m	Rs 37 500	Study required once releases from SSP are out for several weeks
11. Reconnaissance study of mosquito breeding in river channel	2 months	Lower	Local 3m	Rs 37 500	As for 10
12. Water quality and salinity model of river and estuary and study of effluent disposal options	12 months	High	Local 12m Int 2m	Rs 150 000 US\$ 32 000 plus software costs	May include further modelling of estuary morphology. Depends on 8
13. Assessment of costs and benefits of providing compensatory flows	2 months	High	Local 2m	Rs 25 000	Depends on results of 9, 12 and 14
14. Policy options to safeguard freshwater intakes	2 months	High	Local 2m	Rs 25 000	Depends on results of 9 and 12
15. Prediction of ecological changes particularly to fisheries	2 months	Lower	Local 3m Int 1m	Rs 37 500 US\$ 18 000	Depends on results of 4, 9 and 12

\* Assuming Rs 12 500 per month local and US\$ 18 000 per month international.

**ANNEX - XXXIX - (5)**

## Sardar Sarovar Narmada Nigam Ltd.

Block No. 12, 1st Floor, New Sachivalaya Complex, Gandhinagar - 382 010. Phone : 3223504  
 Fax : 079 - 3238691 E-mail ad : dir-cad-ssnnl@gujarat.gov.in, orav@hotmai.com

**O. RAVI** I.A.S.

*Director (Command Area Development)*

No. NPG/MEG/252/318

Date: 29th August 2003

No.SSNNL/Dir.(CAD)/ /2003

Dear

Please refer to your letter No.3-87/80-IA-I, dated 22<sup>nd</sup> July 2003 enclosing the preliminary comments of Shri Shekar Singh, Member, Environment Sub Group on the Integrated Command Area Development Plan (Phase-I) for Sardar Sarovar Project. As desired, detailed point-wise replies/views of Sardar Sarovar Narmada Nigam Ltd. on the issues raised by Shri Shekar Singh is appended herewith for further necessary action.

Yours sincerely,

Sd/-

(O RAVI)

Encl:As above

To

Smt Nalini Bhat  
 Director  
 Ministry of Environment & Forests  
 Government of India  
 Room No.546, 5<sup>th</sup> Floor, Paryavaran Bhavan  
 CGO Complex  
 New Delhi - 110 003

✓ Copy for information to: Shri A C Gupta, Executive Member, Narmada Control Authority, BG-79, Scheme No.74-C, Vijay Nagar, Indore - 452 010

  
 (O RAVI)

**Point-wise Reply to the Comments of Shri Shekhar Singh, Member, Environment Sub-Group, NCA dated 15/7/2003 on Command Area Development Plan (Phase-I) of SSP.**

**Overall Comments**

Irrigation in a true and regular sense has not yet started as the Project is yet to be fully commissioned. Even in Phase-I, the distribution network comprising field channels and field drains is yet to be constructed. The Irrigation Bye-Pass Tunnel (IBPT) was constructed in advance mainly to meet the drought situation. Some irrigation has taken place in an adhoc manner on a very limited scale which has not been taken into consideration by this Integrated Command Area Development Plan. The Plan will come into operation after the completion of canal system along with the distribution network. Hence, it is not too late to plan the command area development.

Numerous studies referred to have indeed provided the requisite resource base for this Plan. The important recommendations/suggestions have not been ignored as alleged. However, the recommendations as referred to by Mr Singh do not pertain to Phase-I such as:

1. Recommendations regarding critical zone Bhal region: This region does not fall in Phase-I of command area and therefore, this will be covered in the plan for Phase-II.
2. Recommendations of M/s HR Wallingford report Annexure-1: This pertains to downstream environment of Sardar Sarovar Dam and not to command area development, therefore, not relevant to this report. However, it may be mentioned here that the recommendation regarding minimum flow in lower Narmada has already been implemented.
3. Recommendation regarding Wild Ass: This again does not come within this Phase. Shall be taken care of in the plan for Phase-II.
4. CES Study of 9 regions 5 to 13 regarding salinity and water logging: These areas are again outside Phase-I hence not covered.
5. This is a plan for the Integrated Command Area Development of Phase-I comprising the districts of Vadodara, Panchmahals, Narmada and Bharuch only.

### Reply to Specific Comments

1. It is true that SSP is the first project in India to plan simultaneous implementation of surface water delivery and rainwater disposal system. Pre feasibility level drainage study for Phase-I was completed in 1983. Out of the 4 zones falling under Phase-I, zone 1 has high ground slope sufficient to ensure adequate sub-surface drainage. Similarly, 46% area in zone 2 and 63% area in zone 3 does not require sub-surface drainage. As far as zone 4 is concerned which is called Bara track, the existing drain density of 0.5-km/sq km shall be enhanced to 1-1.5-km/sq km and for small, medium and large drains a drain coefficient of 4.50, 5.75 and 6.75 lps/ha has been adopted. As the water table in Bara track is well below 5 m, sub-surface drainage is not required. For surface drainage extension of minor drains and remodeling of existing channels is required. This work is being carried out simultaneously with the construction of canal network comprising main canal, branch canals, distributories, minor canals, sub-minors and field channels. Work relating to construction of main canal and branch canals has been completed in Phase-I and rest of the work is in progress. The canal system provides for adequate cross drainage in the form of syphons and bridges to maintain the natural drainage. Reports of inundation are mostly from such areas where such inundations occurred even before the construction of canal system.

(2) Integrated Command Area Plan is a product of detailed planning based on the results of studies and recommendations/suggestions of expert groups set up for the purpose. As stated earlier, regular irrigation is yet to start and therefore, it is not late.

(3) The total command of the project is worked out with an allocation of 21 inches/ha (53 cm) of water supplied annually for irrigation purpose. No irrigation project in the country is planned with such low water intensity. The concept of protective and extensive irrigation through Participatory Irrigation Management has been adopted for the development of command area. Beneficiary farmers will be discouraged to cultivate high water intensive crops such as sugarcane and banana. Research centres have been set up to conduct studies for identifying the most suitable cropping pattern in the command area. SSNNL has set up spearhead groups to disseminate information and create awareness amongst the farmers for adopting best agronomical practices. Further, as per the extant policy of Government no sugar

factories will be set up in command area and due to availability of very limited water.

(4) Tobacco is traditionally cultivated in zone 1, 2 & 5. Since tobacco is not a water intensive crop and Water Users' Associations (WUAs) are free to decide the type of crops to be grown in Village Service Area (VSA) keeping in view availability of a very limited quantity of water, this was not specifically mentioned in the CAD plan. However, cultivation of tobacco is duly incorporated in the detailed study on cropping pattern for command area.

(5) As mentioned in para 4 above, SSNNL will focus on cultivation of value added crops such as tree crops, dry area crops, horticultural crops, vegetables and spices by creating awareness through spearhead groups set up for the purpose which has representatives from State Agricultural Department, Horticultural Department, Agriculture University, Engineering Staff of SSNNL, NGOs and Gujarat State Fertilizer Company/Gujarat Narmada Fertilizer Company.

(6) Class "C" water which is the excess water during the project build up will not be allocated from the Sardar Sarovar reservoir for the purpose of irrigation in SSP command area. This water would be utilized to fill up the village tanks in the command area of SSP. Water would also be released in en route rivers so as to enliven them. However as mentioned in the Plan water for the purpose of irrigation in SSP command area would be released in a predetermined measured quantity and would be given to the Water Users' Associations only. The WUAs are required to distribute water allocated to them to the beneficiaries on rotational basis as per delivery schedule decided by the WUAs in consultation with the project authorities well in advance. The delivery of water to each of the WUAs shall be through such structures which would released only fixed quantity of water and further the regulation of flow of water will be decided by canal automation system. Therefore, question of supplying water in excess leading to problems of water logging and salinity would not arise. Besides, creation of rights for use of surplus water will not be an issue.

(7) The chemical quality of ground water in the command area of Phase-I is generally fair. In most of area of Phase-I surface water and ground water will be used for irrigation directly or with canal water. As per the recommendations on studies of conjunctive use of ground

water by M/s Mac Donald & Partners UK in association with an Indian consulting firm, it is proposed to use buried concrete pipelines for conveying tube well water. The details of the conclusions/recommendations of the above study have been taken into consideration while planning CAD plan as highlighted on page 55-56 of CAD plan. Further as mentioned in the Plan under para 7.5 regarding "Conjunctive use of water" at page 61-62, estimates for region-wise ground water to be used conjunctively and that to be disposed off are worked out. The gross estimate for the entire command area works out to 3351 Million cubic meter (2.71 MAF) of usable ground water and 8.16 Million cubic meters (0.66 MAF) of unusable ground water which will be disposed off as per the recommendations of the aforesaid study.

(8) Overall efficiency achieved in other irrigation projects in Gujarat is about 55%. SSP is planned and designed with proven technologies and new concepts, therefore, it is anticipated that overall irrigation efficiency of the project should increase and is pegged at 65% due to following reasons-

1. Adoption of Rotational water distribution system with volumetric supply of water at a fixed point
2. No irrigation water supply to any individual but bulk supply in measured quantity to the Water Users' Associations only
3. Automatic remote controlled operation of canal system upto 300 cusecs capacity and manual/semi automatic control below 300 cusecs network.
4. Restricted allocation of delta.
5. Lining of entire canal network
6. Command Area development activities.

Losses of water in canal systems of SSP have been carefully estimated.

The canal losses can be broadly grouped as under:

- Seepage and Evaporation losses in main canal, branches and distributaries,
- Seepage and evaporation losses in minors, sub-minors and field channels,
- Field application losses,
- Operational losses in the entire conveyance and delivery system.



The losses have been based on following assumptions:

- The losses in lined system at 2 cfs/msft.
- Losses in unlined system 5 cfs/msft.
- The field application loss will be 20 per cent of the net irrigation requirement.
- The distributaries, minors, sub-minors, whenever so run, will always run full.
- The branches and main canal will run 290 days in a year.
- Operational losses will be about 10 per cent of main canal releases.

Further, main thrust of the project is the empowerment of beneficiary farmers in sustainable water resources management through Participatory Irrigation Management which should ensure actions towards institutional reform as well as improved governance, accountability, transparency and community participation. All these cumulative factors would certainly add to irrigation efficiency and therefore, in our view achieving 65% irrigation efficiency is quite realistic.

(9) As stated earlier recommendations/suggestions of various studies for command area are given due weightage while planning and designing the canal network and taking up construction work in a phased manner.

(10) It is reiterated that there will be no adverse impact on major fauna and flora on account of Sardar Sarovar Project as inferred by various studies and surveys. It may be further noted that the endangered species of Wild Ass does not inhabit Phase-I of command area.

(11) The possibility of suffering of livestock on account of loss of grazing land is remote and not based on facts. As per the extant policy of the Government, the grazing land of a village panchayat cannot be diverted for any other use without approval of Government. On the other hand higher and better quality of grass will be made available after the SSP comes into operation in Phase-II of command area under Integrated Grassland Development Scheme. Further, a large number of farmers will be cultivating rabi jowar in SSP command which can be utilized as fodder by cattle.

(12) Phase-I area of the command is having good drainage efficiency and quality of ground water is also quite fair. Hence problem of salinity and water logging is not likely to arise. But during irrigation, to control the ground water table and minimize the problem of water logging a very limited irrigation water allowance would be permitted. Continuous monitoring of ground water table and its quality will be carried out; use of ground water either directly or with conjunctive use will be practiced. And necessary awareness will be created for adopting land and water management techniques for optimizing land and water use efficiency through Participatory Irrigation Management. It has now been realized that without active participation of beneficiary farmers, the irrigation systems cannot be managed efficiently. The experience shows that wherever farmers have been actively engaged, the overall management of irrigation systems and water use efficiency has significantly improved. After examining the pros and cons of Participatory Irrigation Management concept it has been decided to secure active participation of beneficiary farmers in the development of Narmada command area with an ultimate objective of achieving long term balanced and environment friendly growth.

(13) This issue has been suitably addressed in item 6.

(14) The construction of drainage system is going on concurrently with canal network.

(15) Rivers like Dhandhar, Vishwamitri, Rangai, Orsasng. Heran, Dev, Jambuva and Meni falls under zones 2 and 3, which are having good ground water. Hence problem of salinity will not be there.

(16) A suitable mechanism has already been put in place which involves monitoring of ground water quality four times a year during January, May, August and October. Further, areas having saline ground water and depth of 0 to 5 mt. are identified to take care of drainage. Therefore, the problems relating to water quality in the command are not anticipated in the Phase-I Project.

(17) The drinking water to the villages having saline ground water and also water with high fluoride content will be supplied by Narmada water. Besides due care shall be taken to see that residual drainage water does not contaminate the existing assured supplies of water. Therefore, the observation that the water resources of the villages are

likely to be degraded due to contamination resulting from the project is not correct.

(18) Narmada Main Canal along with its conveyance system crosses number of rivers. Hence with respect to availability of surplus water after considering the requirement of the command area and Domestic, Municipal & Industrial use, a minimum flow in rivers will be maintained in down stream of the escapes provided on the canals. In addition, a minimum flow on down stream of Sardar Sarovar Dam as recommended by H.R. Wallingford report is also being maintained.

(19) SSNNL has planned measures listed on page - 103 under section "Planning" for M&I water supply. M&I water is being provided by the project and its treatment and distribution will be handled by the Gujarat Water Supply and Sewerage Board and other authorities. GWSSB and other authorities will consider these measures during preparation of management plan.

(20) Four agriculture research centres have been established in Phase-I area of the command to conduct research and suggest guidelines on cropping pattern, proper use of fertilizers & chemicals, land and water management techniques and best agricultural practices. Therefore, necessary steps have already been initiated to mitigate the effects of ground water pollution.

(21) The term 'multiple cropping' used in this context means to grow more than one crop in a year and not repeating the same crop in a year. By this method the pest problem will be reduced.

As far as the findings of TATA-IWMI Research Project, it may be noted that upto this juncture, out of total 1197 cooperative societies to be constituted for Phase-I command area, 1015 such WUAs have already been constituted and registered. This indicates the enthusiasm and overwhelming response of the beneficiary farmers to adapt the concept of Participatory Irrigation Management. All the WUAs are functional and are willing to shoulder the responsibility pertaining to PIM. SSNNL had posed the project Phase-I for financial assistance under centrally sponsored Command Area Development Programme to Ministry of Water Resources, Government of India and this project has already been approved for inclusion under the said programme by Inter Ministerial Sanctioning Committee at an estimated cost of Rs.955.64 crore. Formal sanction of the project is awaited from GOI

and SSNNL has already worked out a detailed strategy to construct the distribution system which includes construction of sub-minors, field channels, field drains/link drains with farmers' participation till such time a separate Authority is constituted for the purpose. In this backdrop, it is too premature to draw any negative inference.

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**ANNEX - XXXIX - (6)**

भारत सरकार  
GOVERNMENT OF INDIA  
जल संसाधन मंत्रालय  
MINISTRY OF WATER RESOURCES  
सरदार सरोवर निर्माण सलाहकार समिति  
SARDAR SAROVAR CONSTRUCTION  
ADVISORY COMMITTEE

No : SSC/PB/2003/1680

Dated 1<sup>st</sup> October 2003

To  
Dr. Pawan Kumar,  
Director (Environment)  
Narmada Control Aurhotiy,  
BG-113, Scheme No. 74-C,  
Vijaynagar,  
INDORE

Sub : Command Area Development Plan of Gujarat for Sardar Sarovar Project.

Ref : Your letter No : Env-3(38)/2001 dt. 22<sup>nd</sup> May 2003 and No. 3(39)/2003  
dt. 19<sup>th</sup> August 2003.

Sir,

Please find enclosed our comments on the Command Area Development Plan of Gujarat for SSP for favour of further necessary action at your end.

Encl : As above

Yours faithfully,

(INDRA RAJ)  
SECRETARY

11/10/03

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## **COMMENTS ON THE 'COMMAND AREA DEVELOPMENT PLAN' OF SSP**

### **GENERAL**

The 'Integrated Command Area Development Action Plan' Phase I Vol I by Sardar Sarovar Narmada Nigam Ltd, Gandhinagar has been prepared to study the Irrigation Planning and command area development of Sardar Sarovar Nahar Irrigation command in Gujarat covering a CCA of 18.7 lacs hectare in 14 districts of the state. The entire CCA is divided into 13 agro-climatic regions and water allocation is proposed depending upon the rainfall, ground water availability and local needs. Project provides for delivery of water from distributory off-takes only to large group of farmers (WVA), collection of water charges on volumetric basis and turning over the management of water distribution/preparation/maintenance to the farmers. Project authorities have completed various studies in the command area pertaining to Environment, Agriculture, Engineering and socio-economy, etc. for planning the Command Area Development Plan for SSP. The objectives of the CAD plan are :

- (i) Preparing plan of actions based on studies carried out and considering the existing schemes/programmes.
- (ii) Prioritising the mitigating adverse impact.
- (iii) Preparing the total financial outlays.
- (iv) Planning conjunctive use, forestry and measures for anti water logging/ soil degradation/water contamination.
- (v) Frame work of socio-economic upgradation in the command.

### **(A) GENERAL COMMENTS**

- (1) The action plan is sketchy and only gives an outline strategy of CAD works. It describes criteria and approach of various works but does not give any concrete action plan of the various works to be carried out.
- (2) Plan does not indicate any cost estimate for various works except for Public Health, 'Fishing Dev Plan' and Flora and Fauna.
- (3) Various plates (diagrams) have been mentioned as enclosed, but these are not seen in the report.

- (4) It is requested to give full form of several abbreviations used in the report.
- (5) Institutional framework and infrastructure for various works are not indicated in detail.
- (6) A booklet containing briefs of the various studies undertaken to far/or under progress should be published separately.

(B) **CHAPTERWISE COMMENTS**

**Chapter -2 : Agriculture Sector**

- (i) Plate I is not enclosed. What is meant by Region or category or zone is not vividly explained.
- (ii) Any proposal for future planning etc is not described.
- (iii) Calculation of value of proposed crop are not shown.

**Chapter-3 : Command Area Development Plan**

- (i) Strategy outlined is as per National water policy and the planning concepts are good.
- (ii) Control volume concept and downstream free draining delivery network should be explained with the help of diagrams to make it comprehensive
- (iii) The system response in emergency condition should be explained with the help of diagrams.
- (iv) Detailed action plan and costing of different component is required to be given. Cost of operations, drainage facility, water user associations, infrastructure cost, etc should be given.
- (v) Strategies for online farm management have not been outlined. Drip and sprinkler irrigation should been thought of in a big way considering the terrain and climatic condition as well as water scarcity conditions. The village ponds have to be integrated with the distribution system. In some areas , field ponds can also be created as has been planned in Indira Gandhi Command.

- (vi) The ground water monitoring system is functioning in the existing SSP command. The changes noticed in the quality and the water levels may be indicated.
- (vii) Agriculture extension services in the commands need to further expanded under the CAD, considering the extent of command. Detailed planning has to be worked out and outlined in the report.
- (viii) The CAD plan may also be got vetted by CAD wing of Ministry of Water Resources, GOI

#### **Chapter-4 : Command Area Development**

- (i) Operation plan for water releases from dam during early stages is stated to be given, but is not available.
- (ii) The various studies undertaken in the command area are available with planners. It would be proper to prepare one/two page briefs/recommendation of each such study. This should be made available to appreciate the work done so far and how it has been integrated in the present report.

#### **Chapter-7 : Development Plan ; Soil Salinity and water logging**

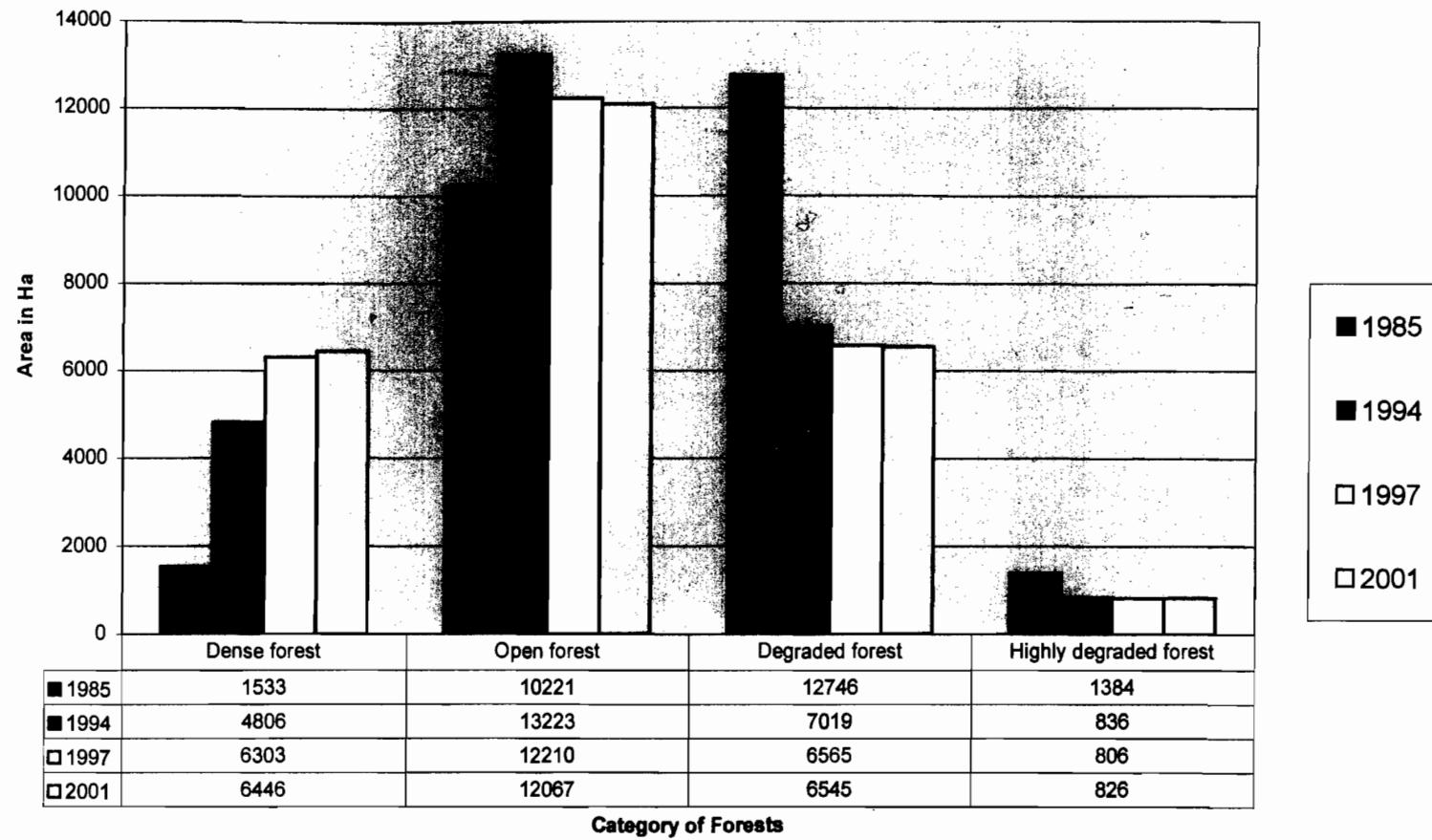
- (i) Chapter has described the ground water systems, drainage studies, ground water modelling and ground water monitoring system.
- (ii) Action plan for construction of various drains, land leveling and channels remodeling should be worked out with cost tables and institutional details.
- (iii) Ground water system monitoring work is carried out by Ground Water Dept. of state. How this is to be integrated with CAD and what is the cost sharing arrangement may be indicated.
- (iv) Maps/Plates as stated in the chapter are not enclosed.

#### **Chapter-8 : Development Plan Agriculture**

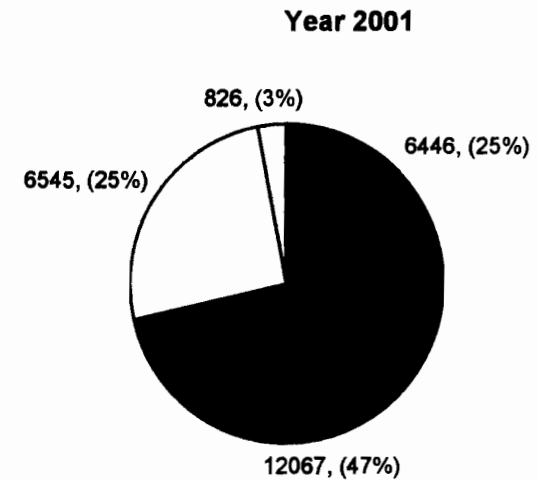
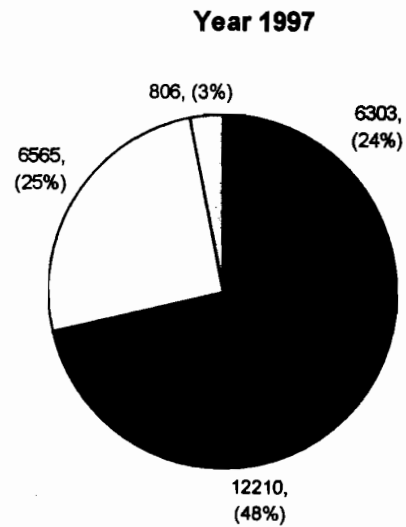
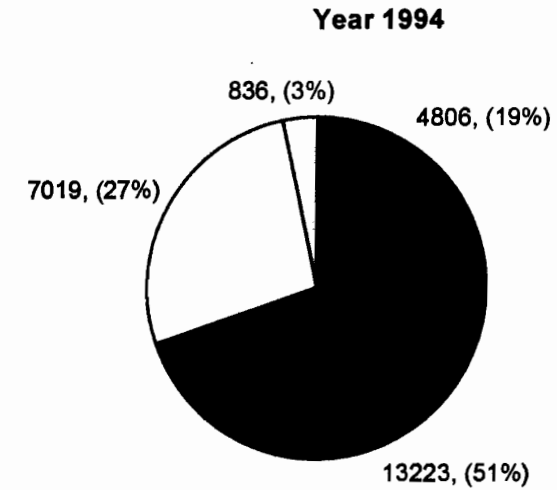
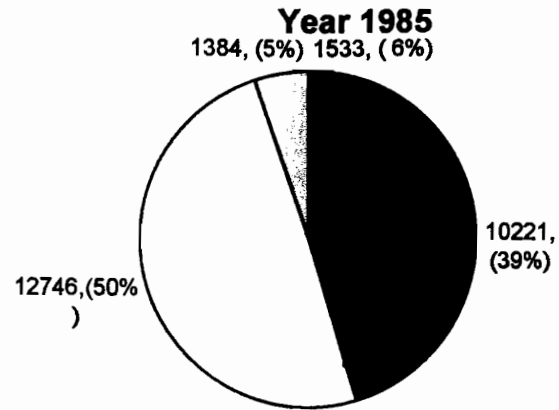
- (i) Action plan and cost estimates should be worked out.
- (ii) Institutional set up should be indicated.



Forest Cover Status (based on remote sensing data)



### Status of Forest in the SSP Catchment Area ( based on remote sensing data)



- Dense Forest
- Open Forest
- Degraded Forest
- Highly degraded Forest

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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**उनतालीसवीं बैठक का कार्यवृत्त**  
**Minutes of the 39<sup>th</sup> Meeting**

26 दिसम्बर, 2003 को  
पर्यावरण भवन, नई दिल्ली में हुई  
**Held at Paryavaran Bhawan, New Delhi on 26<sup>th</sup> December, 2003**

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**Indore**

**MINUTES OF THE 39<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF THE NCA  
HELD ON 26<sup>th</sup> DECEMBER, 2003 AT PARYAVARAN BHAWAN,  
CGO COMPLEX, NEW DELHI**

**I N D E X**

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**MINUTES OF THE 39<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF THE NCA  
HELD ON 26<sup>th</sup> DECEMBER, 2003 AT PARYAVARAN BHAWAN,  
CGO COMPLEX, NEW DELHI**

The 39<sup>th</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held at Paryavaran Bhawan, CGO Complex, New Delhi, under the Chairmanship of Dr Prodipto Gosh, Secretary, Ministry of Environment & Forests (MoEF), Govt. of India. A list of participants is enclosed at **Annex-XXXIX-Min-(1)**.

The Chairman welcomed the Members and Invitees of the meeting. After brief introduction of the participants he requested Member Secretary of the Sub-group to take up discussions on the Agenda items .

**Item No.XXXIX-1(180)      CONFIRMATION OF THE MINUTES OF THE 39<sup>TH</sup>  
MEETING**

Minutes as circulated vide NCA Office letter No.Env-3(38) /2003 /1398-1437 dated 28<sup>th</sup> April, 2003. were confirmed with the following observations:

1. The request of N.H.D.C., being factual was accepted and accordingly the statement of expenditure shall be corrected.
2. The views of the GoMP were presented by the Vice Chairman, NVDA, but no change in the minutes on this account was considered necessary.
3. GoG officials did not press for amendment in the minutes.
4. Request of Dr. Shekhar Singh, for corrections in the minutes for reflecting his view that monitoring of environment safeguard measures should also be done by an independent body was not considered in view of the fact that there was already a Sub-committee constituted by the Sub-group on the advise of the MoEF.

**Item No.XXXIX-2(181) REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

**A. Construction Schedule: Sardar Sarovar Project:**

Progress was noted by the Sub-group.

**B. Current Status of Implementation of the Environmental safeguard measures for the Sardar Sarovar Project was reported by the party states which is presented below :**

**(a) Catchment Area Treatment**

**Phase-I Programme (1,79,180 Ha.). (Quantitative)**

It was reported by the GoMP that entire catchment area commensurate with dam height of 110.64m RL was already treated and that the remaining area was not treatable on account of being rocky, water logged etc.

The Chairman desired that the reason for areas considered unsuitable for treatment should be explained and that sample photographs of such areas should also be presented by the next meeting of the Environment Sub-group (ESG). It was also suggested that the willing Members could be invited by the NVDA for visiting such areas, if requested.

**Phase-I Programme (Qualitative)**

The Vice Chairman, NVDA informed that the silt load data of the 14 gauging stations was already available with the CWC, who have been requested to analyze the same for the benefit of the party states. GOMP was requested to present the results of the analysis during the next meeting. On the suggestions of the ESG for taking up assessment of the treated areas through satellite imageries, Vice Chairman, NVDA informed that the data of the Forest Survey of India indicated increased green cover for M.P. The Chairman, however, desired

that the data on the treated areas should be obtained and presented in form of a report before the next meeting of the ESG.

The ESG could not review the progress in Maharashtra due to the absence of representatives from Maharashtra. After some discussions, it was agreed that the Chairman would appraise the Chief Secretary, Govt. of Maharashtra on the deficiencies in the compliances and lack of participation of the Govt. of Maharashtra officials during the meeting.

Dr. Shekhar Singh pointed out that, the ESG was not having any access to the official reports on silt monitoring exercise in either of the States of Gujarat, Maharashtra or Madhya Pradesh and that silt monitoring stations of the CWC might not be in the areas treated by the project authorities and therefore, might not serve any useful purpose.

The Chairman stated that the CWC could be relied upon on the analysis of silt load in the river system. However, the point raised by Dr. Shekhar Singh be examined after receipt of the report.

**(b) COMPENSATORY AFFORESTATION : Planning and progress  
Government of Gujarat**

CCF, SSNNL, informed that the process of notification of non forest areas as forest land has already been set in motion and that Territorial Divisions have already taken up possession of the plantations raised on non forest land and the notifications were under issue.

**Government of Madhya Pradesh**

Vice Chairman, NVDA informed that 193 ha. area out of 2,184 ha. was already notified and notification for another 921 ha., has already been sent to the Government Press for publication in the Gazette of the State Govt.



Member (E&R), NCA requested that copies of notification for the areas in Maharashtra, Madhya Pradesh and Gujarat should also be made available to the NCA.

#### **COMPENSATORY AFFORESTATION : Qualitative**

The Chairman stated that success rate of plantation would be better appreciated if indicated along with composition of species, the year of counting and the age of plantations.

#### **(c) COMMAND AREA DEVELOPMENT**

Member (E&R), NCA drew the attention of the Members towards the comments received from Dr. Shekhar Singh and the Secretary, SSCAC on Phase-I CAD plan of GoG circulated amongst the members of the ESG by NCA. Dr. Shekhar Singh stated that his observations were specific but the answer received from GoG was of very general nature. He further pointed out that a detailed CAD plan should be available before the issue of clearance of ESG for raising the dam height was discussed any further. It was pointed out by him that Planning Commission had very clearly specified that the submission of CAD plan formed a part of the project component and should have been available before the commencement of the irrigation. He also drew attention of the Members towards the observations of SSCAC on this issue also which indicated that despite so many years, plan was not yet available.

Managing Director, SSNNL explained that most of the points raised by Dr. Shekhar Singh, pertained to Phase-II of the Command Area and that the proposal to raise the dam height to 110.64m RL would confine the waters to Phase-I area only. It was further explained by him that the water drawn at this stage would be

mainly for drought relief works and that only a very small percentage of area was irrigated last year. He pointed out that development of command area was a long drawn process and submission of a plan of such a long period might not be adhered to at this stage. He further explained that submission of the CAD plan was actually delayed due to uncertainty which prevailed during 1994-2000 due to the litigation pending in the Hon'ble Supreme Court of India.

The Vice Chairman, NVDA also requested the Chairman that delay in submission of CAD plan should not be a guiding factor as dam was the property of all the States and generation of electricity was of prime importance for Madhya Pradesh and Maharashtra and therefore, permission to raise the dam height to 110.64m RL should not be linked with the submission of CAD plan.

The Chairman summed up the discussions by saying that it required huge resource and manpower for publication of micro level CAD plan and it might not be possible to prepare it in a short time and stated that this might be one of the reasons for delay in submission of the plan and desired that detailed plan for the entire command area should be submitted within the next three months time. He suggested that if the plan was voluminous, it could be made available in CD ROM and circulated by the GoG to all the Members before the next meeting of ESG. It was further clarified by the chairman that report would be accompanied by only unrestricted maps on appropriate scale.

Although no one from Rajasthan was present in the meeting, during the discussions on the subject Member (E&R) pointed out that CAD plan for Rajasthan areas should also be submitted along with the plan for the areas in Gujarat. However, the representative of Rajasthan, subsequently joined and agreed to

provide 30 additional copies of the draft plan for circulation to the Members of the ESG for discussions during the next meeting.

**(d) FLORA, FAUNA, & CARRYING CAPACITY**

**Status of Implementation on recommendation of studies terrestrial and Aquatic Fauna Fisheries:**

Progress was noted by the Sub-group.

**Felling of trees from submergence area**

Dr. Shekhar Singh stated that about 600 ha. area in Maharashtra between 100-110m RL was yet to be felled and more than 100 ha. area lied submerged below 100m RL. He pointed out that it may have serious negative environmental consequences. Member (E&R) stated that non felling of trees in the submergence area will have potential negative consequences like degradation of water quality, formation of Hydro Sulphuric Sludge apart from endangering the wildlife in the area and hence it would be desirable that the trees in the submergence area are removed before commencement of further submergence. CCF, SSNNL drew the attention of the Members that very small part of total submergence area (about 6% only) was not felled and that it might be ignored being of less consequences. Chairman summed up the discussion by saying that tree growth from the submergence area should be removed before commencement of impoundment and report should be presented before the next meeting for a review.

**(e) SEISMICITY AND RIM STABILITY**

Director (Canal), SSNNL, informed that data collected at the stations will be analysed and put up for a review before dam safety panel by next month and the progress would be reported during the next meeting.

**(f) HEALTH ASPECTS**

Dr. Shekhar Singh brought to the notice of the Members that on Page No.14 of the Agenda papers, most of the items were shown as incomplete, awaited or weak for the areas in Maharashtra and Madhya Pradesh and that the ESG must get an opportunity to review the progress before considering the request of the GoG.

The Vice Chairman, NVDA, brought to the notice of the ESG that NVDA had already engaged ICMR as experts and that work has already been initiated. It was further pointed out by him that health delivery system was already in place in the areas close to the submergence. Beside, 99 R&R sites were equipped with medical facilities as per the directions contained in the NWDT Award. The additional activities promised were being provided and monitoring mechanism has already been evolved by the NVDA.

The Chairman was of the view that additional facilities as required must be provided and the monitoring reports should also be available before the next meeting. He further suggested that the data on the health issue available with the party States should be put up on the web site (s).

**(g) ARCHAEOLOGY**

The Vice Chairman, NVDA informed that all the works related to relocation of temple at Roligaon were already completed and that relocation works related to temple at Choti Khasrawad would also be completed by January, 2004. He

thanked the Secretary (Env. & Forests) for taking initiative for getting permission from ASI through a specially convened meeting towards relocation, protection and excavation works in M.P. which made it possible to complete all the works in time .

(h) **DOWN STREAM ENVIRONMENT**

Dr. Shekhar Singh, pointed out that Agenda papers were not fairly detailed and that a detailed plan for maintaining flows in the down stream would be needed for perusal of the ESG before any decision on this aspect could be taken

Managing Director, SSNNL pointed out that reports on down stream environment were available and the suggestions made therein were being followed. He assured that SSNNL would be taking all the needed measures presented in the Agenda papers in time. In response to a question by the Chairman, it was pointed out by the Director (Env.), NCA that as per NWDT award, GoG was required to assess the requirement of the down stream users and to release the needed quantum of water for such users out of it's own share. A series of studies on requirement of water for flora, fauna, fisheries, channel morphology through mathematical modeling etc. were conducted by the premier Institutes and the results of these studies were analysed for mitigating the negative consequences of the stoppage of the flows to downstream on aquatic flora and fauna , fish and fisheries, health aspects, pollution load etc. and the results were translated in the form of action plan at each time the dam height was raised. The requirement of water for downstream users were met in the past by releasing the water from the down stream projects in Gujarat. In order to sustain the minimum needed flows, water was pumped from the dam / dykes in a planned manner. Similar plan would be required at this stage also.

The Chairman directed that there should be a formal plan for maintaining down stream flows. This plan should include detailed analysis of the requirement of the down stream users and monitoring of down stream release should be ensured.

**C. Status of the implementation of the environment safeguard measures corresponding to 110.64m height of SSP.**

The Chairman invited views from the participants on request of the GOG for raising the dam height to 110.64m RL.

- (1) Managing Director, SSNNL, requested the ESG that there was a substantial compliance except for felling of trees in Maharashtra and the plan for down stream areas in Gujarat. He pointed out that felling in Maharashtra constituted a very small portion and that GoG was rigidly following the suggestions contained in study reports on the down stream requirement and, therefore, such a small requirement should not hold up the clearance.
- (2) The Vice Chairman, NVDA stated that the primary benefit of the project was not only in terms of irrigation but also generation of electricity. All the party states have made substantial investment in this project and are eagerly awaiting for sharing it's benefits. Since there has been substantial progress in the implementation of all the environment safeguard measures corresponding to 110.64 m height of SSP, the ESG should favorably consider the request of party states.
- (3) Dr. Shekhar Singh pointed out that there were gaps in almost all the areas of concern and ESG must be given an opportunity to review various reports / plans which were yet to be submitted before the ESG considers the request for giving its clearance to raise the dam height to 110.64m.

- (4) Shri B.G. Verghese pointed out that though there were some gaps in implementation of the safeguard measures, yet considering the manifestation of the negative consequences that would arise due to drought and famine in the command area , permission can be considered by the ESG with certain riders.

The issue was discussed and it was agreed to accede to the request of GoG and accordingly ESG recommended raising of the dam height from the present 100 to 110.64m RL subject to the condition that all the gaps in implementation of the Environment Safeguard Measures would be filled up in time and the status of compliance would be monitored strictly and submitted before the next ESG meeting. Dr. Shekhar Singh, however, disagreed with the decision and desired that his note of dissent may be recorded.

**Item No. XXXIX-3(182): REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES INDIRA SAGAR PROJECT :**

Vice Chairman, NVDA, Bhopal opined that ISP should not be discussed in this forum keeping in view that it was agreed in the 6<sup>th</sup> meeting of the Review Committee of NCA to evolve an alternative mechanism for monitoring of the R&R aspects of ISP and for the same reason environmental aspects of ISP should also not be monitored by the NCA. Further, it was brought to the notice of the ESG that GoMP have proposed to take up this issue in the RCNCA during its next meeting. He agreed to provide information / data to the NCA whenever requested and stated that MoEF can monitor the Environmental Aspects of ISP through an alternative mechanism but not through NCA.

Executive Member, NCA explained that during the 6<sup>th</sup> meeting of the RCNCA only the R&R monitoring of ISP by the NCA was discussed and it was agreed by the Hon'ble Union Minister of Environment & Forests that an alternative mechanism would be evolved for monitoring of R&R aspect of ISP. RCNCA has not given any suggestion or direction on the issue of monitoring of the environment safeguard measures by the ESG. As per the directions contained in the order of clearance of the project by the MoEF, ESG was monitoring the environmental aspects of ISP since 1987. The Secretary, MoEF during the meeting in the past after considering all the points had affirmed that ISP would continue to be monitored by the ESG from environmental considerations.

Dr. Shekhar Singh pointed out that the clearance order issued by the MoEF itself had very clearly stated that both ISP and SSP would be monitored by the NCA.



Chairman observed that the environmental aspects of ISP were being monitored by the ESG from the very beginning and that there was no direction from any authority contrary to this. Therefore, he reiterated that ISP would continue to be monitored by the ESG. Thereafter, the Govt. of M.P. officials presented the upto date status of compliance of various environment safeguard measures in ISP as below :

**A. CONSTRUCTION SCHEDULE:**

Progress was noted by the Sub-group.

**B. Current Status of Implementation of the Environmental safeguard measures**

**(a) CATCHMENT AREA TREATMENT**

Treatment of Phase-I areas of the Catchment would be completed within the calendar year 2004.

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

Compensatory afforestation is yet to be carried out in about 600 ha. which would also be carried out soon.

**(c) COMMAND AREA DEVELOPMENT AND DOWNSTREAM CONSIDERATION**

That CAD plan was submitted by the GoMP while seeking clearance from MoEF which is being revised and up dated on the suggestions of the ESG. A committee has been constituted for this purpose. One NCA official has also been included in the Committee. Presently, digitised maps were under preparation and geographic information system to coordinate the activities and to provide decision support was being developed with the help of identified agencies. He drew the attention of the Chairman regarding the problem faced by the GoMP in getting the permission from the Ministry of Defence for using the digitised data available with the certain organizations. He informed that a request from GoMP has been made to Secretary, MoWR and a copy of which has also been forwarded to MoEF. He requested him

to help the GoMP in this regard. Chairman agreed to examine and to take up this issue with Defence Secretary for expediting the work.

Member (E&R) pointed out that progress of works on development of canal system was in fact very slow and that it should be completed in time. The Vice Chairman, NVDA stated that GoMP in consultation with MoWR have already fixed up the agency for execution of works on development of canal system for the ISP and that studies assigned to Jawaharlal Nehru Agricultural University, Jabalpur were not yet completed. The report would be presented as soon as it was available.

Dr. Shekhar Singh drew the attention of the Sub-group to the non completion of the CAD plan and pointed out that even though dam was likely to be completed in a year or two, CAD plan was not yet ready. He also pointed out that ESG was not aware of any plan for mitigating negative consequences in the down stream of ISP.

In response to a question from the Chairman, Director (IA), MoEF stated that information was received from the NCA as well as from the Newspapers regarding closure of diversion tunnel of ISP which resulted in impoundment in the ISP reservoir. This had serious environmental implication and required advance planning on submission of the needed plan for upstream / downstream and command area also. NHDC was requested to provide factual information to the MoEF. No information was provided by the NHDC or the NVDA on the status of construction of the ISP though as per the terms of the order of clearance, it was required that GoMP would keep the MoEF informed of the progress of construction and stoppage / reduction in flow in the downstream of the project in future.

The Vice Chairman, NVDA stated that while closing the diversion tunnel officers of CWC and Water Resources Department of M.P. and NVDA officials were

informed. Though there was no flow in downstream for 8 hours but the situation was controlled subsequently when flow was increased.

Dr. Shekhar Singh pointed out that closure of the diversion tunnel resulting in no flow or less flow in downstream of the ISP had serious environmental consequences for which the permission of the ESG was necessary which has not yet been taken.

The Chairman directed that the GoMP / NVDA should keep the MoEF / ESG informed in advance of stopping flows down stream henceforth as it might have serious environmental consequences.

**(d) FLORA, FAUNA AND CARRYING CAPACITY**

Vice Chairman, NVDA, informed that as the matter was still under consideration of the State Cabinet no progress on the notification of National Park / Wildlife Sanctuary could be achieved. He, therefore, requested some more time for the same.

The Chairman stated that NVDA should keep the ESG informed of progress / result of the decision of State Cabinet on notification for the National Park and Sanctuary.

**(e) SEISMICITY AND RIM STABILITY**

The VC, NVDA informed that the data collected at the monitoring stations was being analysed at the identified Institutes.

**(f) HEALTH**

Vice Chairman, NVDA, informed that draft plan for the up-stream was almost ready and that the health issue for the areas in command would be included in the CAD plan.

**(g) ARCHAEOLOGY**

Vice Chairman, NVDA informed that all the monuments corresponding to the present height have been relocated and plan was in operation.

**ANTHROPOLOGY**

Vice Chairman, NVDA, informed that except 2 mounds all have been excavated. As permission has been received from the ASI for excavation of these two mounds also, works on these would also be completed soon.

**Item No. XXXIX - 4 (183) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

**1. Phase-I Establishment of Silt Monitoring Stations.**

Already covered under Item No.1 above.

**2. Phase-II Submission of Catchment Area Treatment Plans and implementation.**

Vice Chairman, NVDA, informed that though there are provisions for charging the cost for treating the Phase-I area to the project, there was a huge requirement of the resources of treating the Phase-II area and, therefore, requested the Chairman to help GoMP for providing financial assistance for treating Phase-II areas.

Addl. Commissioner (WP), Ministry of Agriculture, informed that it was earlier agreed to include ISP under the Centrally sponsored scheme of the Planning Commission. However, subsequently this was subsumed under macro management mode and now it is up to the State Govts., to allocate the resources within its quota provided by the Central agencies.

The Vice Chairman, NVDA, stated that even though last year Rs.6.00 crores were provided but allocation for this year had been very meager for only Rs.2.00 crores and with this allotment, it would be difficult to treat Phase-II area in near future. Addl. Commissioner (WP), Ministry of Agriculture, however, stated that demand for additional funds if received might also be considered on merit.

**B. MONITORING WORKS IN MAHARASHTRA**

**1. Funding of the works on implementation of action plans for mitigation of adverse impacts**

Could not be discussed due to the absence of Govt. of Maharashtra officials in the meeting.

**2. Agency for Inter Departmental Coordination for effective implementation of the plans in time :**

Could not be discussed due to the absence of Govt. of Maharashtra officials in the meeting.

**C. SARDAR SAROVAR PROJECT : ENVIRONMENT MANAGEMENT**

- 1. Publications**
- 2. Seminar / Workshops**

The information provided was noted.

**D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

- 1. Indira Sagar Project**
- 2. Sardar Sarovar Project**

The information provided was noted

**E. FORMATION OF MULTI DISCIPLINARY COMMITTEE BY THE MOEF FOR APPRAISAL OF SURVEY AND STUDY REPORTS ON VARIOUS ENVIRONMENTAL ASPECTS OF SARDAR SAROVAR PROJECT,**

Director (IA), informed that a meeting of MDC was held on 22.12.2003 and the report was already finalized and shall be submitted soon to the MoEF. She also informed that formation of this Committee was by and for the MoEF.

Chairman observed that the Committee is out of the purview of the ESG and, therefore, ESG should not discuss this item. Therefore, this item was dropped.

## **DATE AND VENUE OF THE NEXT MEETING**

It was suggested by the Chairman that next meeting of the ESG would be held during second week of April, 2004, at SSP project site at Kevadia in Narmada District, Gujarat. Exact date of the meeting will be decided in due course. He requested all the party states to ensure submission of compliance reports on all the Environment Safeguard Measures corresponding to 110.64m height of SSP well before the next meeting.

**Meeting ended with vote of thanks to the Chair.**

# ANNEXURES



**ANNEX-XXXIX-Min-I**

**LIST OF PARTICIPANTS OF THE 39<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 26<sup>th</sup> DECEMBER, 2003 AT PARYAVARAN BHAWAN, NEW DELHI.**

**Ministry of Environment & Forests**

1. Dr. Prodipto Ghosh, Secretary, MOEF, New Delhi
2. Shri R.Chandra Mohan, JS, MOEF, New Delhi
3. Dr. Nalini Bhat, Director, MOEF, New Delhi

**Narmada Control Authority**

1. Shri A.C. Gupta, Executive Member, NCA, Indore
2. Shri Suresh Chand, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore
4. Shri Kuldeep Malik, Dy. Director (Env.), NCA, Indore

**Ministry of Water Resources**

1. Shri A.D. Bhardwaj, Commissioner (PR), MOWR, New Delhi

**Sardar Sarovar Construction Advisory Committee**

1. Shri Indra Raj, Secretary, SSCAC, Vadodara

**Ministry of Agriculture**

1. Dr. Shamsheer Singh, Addl. Commissioner (WP), MOA, New Delhi

**EXPERT MEMBERS**

1. Dr. Sekhar Singh, Expert Member, New Delhi.
2. Shri B.G. Varghese, Expert Member,

**GOVERNMENT OF GUJARAT**

1. Shri S.K.Mohapatra, Managing Director, SSNNL, Gandhinagar.
2. Shri R.V.Asari, CCF, Govt. of Gujarat State, Gandhinagar
3. Shri O.Ravi, Director, CAD, SSNNL, Gandhinagar.
4. Shri S.D.Desai, Director (Canals), SSNNL, Gandhinagar.
5. Shri Ashwin Parmar, Spl.(Env.), SSNNL, Gandhinagar
6. Dr. D.H.Bhat, Jt. Director (Health), SSNNL, Gandhinagar
7. Shri D.B. Vyas, OSD, NPG, Gandhinagar.

## **GOVERNMENT OF MADHYA PRADESH**

1. Shri Pradip Bhargava, Vice Chairman, NVDA, Bhopal
2. Shri J.P. Vyas, Member (E&F), NVDA, Bhopal
3. Shri R.K.Behre, SMS, NVDA, Bhopal.
4. Shri A.K. Jain, SMS (Aff.), NVDA, Bhopal.
5. Shri S.N. Chatterjee, Consultant Fisheries, NVDA, Bhopal.
6. Dr. P.W. Kavathakar, Health Advisor, NVDA, Bhopal.
7. Shri V.B. Bhatt, Dy. Manager (Env.) , NHDC, Bhopal.

## **GOVERNMENT OF RAJASTHAN**

1. Shri D.S. Mathur, Addl. Chief Engineer, Jodhpur Rajasthan.
2. Shri N.R.Mehta, S.E., Narmada Canal Project Circle, San chore, Dist. Jalore.

## ENVIRONMENT SUB-GROUP : AGENDA FOR THE 40<sup>TH</sup> MEETING

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## ANNEXURES

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( II )

# **NARMADA CONTROL AUTHORITY**

*Environment Sub Group*

*40<sup>th</sup> meeting*

*16<sup>th</sup> January 2004*

*Agenda*

**ENVIRONMENT SUB-GROUP  
AGENDA FOR THE 40<sup>th</sup> MEETING**

**Item No. XL-1(184) : CONFIRMATION OF MINUTES OF THE 39<sup>th</sup> MEETING**

Minutes of 39<sup>th</sup> Meeting of Environment Sub-Group of Narmada Control Authority were circulated to all Members and Invitees vide NCA Office letter No.Env-3(39)/2004/362-402 dated 16<sup>th</sup> January 2004.

Observations received from SSNNL are enclosed at Annex – XL-(1).

The sub-group may discuss & confirm the minutes.

**Item No. XL-2(185): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

**A. CONSTRUCTION SCHEDULE:**

**(a) SARDAR SAROVAR PROJECT:**

As per the approved construction programme of the SSP the height of the dam was to be raised to EL 110.64m by the end of June, 2003. This has been delayed due to various reasons. However, NCA on the basis of the decision taken during the 70<sup>th</sup> meeting held on 12-13 March, 2004, has directed SSNNL / Gujarat, on 16.3.2004, to raise the dam to this level by June, 2004. The resulting impoundment upstream of SSP would extend up to 141 km. from the dam site and the corresponding submergence will be about 11,500ha, out of a total of 37,533 ha. as could be ascertained from the area capacity curve of the SSP annexed with the project report.

To facilitate a review of the compliances on the conditions contained in the order of clearance and subsequent direction of the MoEF / Environment Sub-group, status of the implementation of the environment safeguard measures is presented below for consideration of the Sub-group

**B) Current Status of Implementation of the Environmental safeguard measures for the Sardar Sarovar Project is presented below for review by the Members**

**(a) CATCHMENT AREA TREATMENT**

- Project authorities were required to prepare the plans for Phase-I programme for treating those critically degraded sub-watersheds which were identified as directly draining into the reservoir. The implementation of the Phase-I plan was to be pari-passu with the construction of the dam
- The balance sub-watersheds were to be treated under Phase-II programme for implementation in a time frame to be determined separately.

**PHASE-I PROGRAMME (1,79,180 ha.). (QUANTITATIVE) at FRL.**

STATE	Targets (ha.)		Achievements		Status of Compliance
	No. of Sub-water-sheds	Area(ha.)	No. of Sub-water-sheds	Area(ha.)	
Gujarat	15	29157	15	29157	100% Complied
Maharashtra	17	24298	17	23295	95.87% Complied
Madhya Pradesh FRL	42	125725	42	110712	88.05% Complied

During 39<sup>th</sup> meeting it was pointed out that the balance area requiring treatment are in fact not treatable on account of being rocky or non availability of the areas due to

various reasons. It was agreed that photographs showing non treatable areas would be submitted for information of the Members during the next meeting.

Progress may please be presented.

#### PHASE-I PROGRAMME (QUALITATIVE)

	Silt Monitoring Stations	Assessment through Remote Sensing
Govt., of Gujarat	Final Report awaited	Complied
Govt., of Maharashtra	Forest areas: Yet to be initiated Non forest areas: 2 Stations established, reports not available	FSI being requested
Govt., of Madhya Pradesh	Agency yet to be finalised	Not initiated

Progress on monitoring of efficacy of the catchment area treatment works through silt monitoring / remote sensing for the identified sub-water sheds may please be presented for a review by the Members.

#### (b) COMPENSATORY AFFORESTATION : Planning and progress

13386 ha forest land was diverted by MOEF vide it's order of 1987, with certain conditions. The main conditions were as follows:

- (a) For every hectare of forestland submerged or diverted for construction of the project there should be Compensatory afforestation on one hectare of non-forest land **plus** penal reforestation on two hectares of degraded forest.
- (b) For the 4,200.00 hectares of forestland in Maharashtra, which is to be used for R&R, an equal area of non-forest land **or** double the area of degraded forest should be planted.

#### COMPENSATORY AFFORESTATION (QUANTITATIVE) upto FRL.

STATE	Targets (ha)	Achievements (ha)	Status of Compliance
Govt., of Gujarat	13,950	13,950	Completed
Govt., of Maharashtra			
a) For Submergence	19,468	19,378	Completed*
b) For R&R works	4,200	4197.5	Nearly completed
Govt., of Madhya Pradesh	8,737	8,737	Completed

\* 90 ha. area not available for treatment hence considered completed.



**COMPENSATORY AFFORESTATION (QUALITATIVE)**

STATE	Studies on neo ecosystem	Success rate		Transfer to territorial forest divisions
<b>Gujarat</b> As per the information given during the field visit on 19 <sup>th</sup> Dec 2001	Report awaited	survival %	Area	Reported to be completed but details of notification etc are not supplied
		Non Forest Area in Kuchchh.4,650 ha.		
		> 50%	50% area	
		30to50%	38% area	
		below 30%	12% area	
		Forest Area (9,300 ha.)		
		Awaited	Awaited	
<b>Maharashtra</b> GOM letter 5 <sup>th</sup> July 1995 & 27 <sup>th</sup> Jan2003	Not relevant	In most of the areas survival > 50% as per information of 1995 and 2003		Complete details of notification etc. are awaited. Copies of notification available for Amrawati Circle. About 6420 ha. reportedly notified out of 10,599 ha.
<b>Madhya Pradesh</b>  As per information vide NVDA letter No. 628 of 6 <sup>th</sup> April, 2002 (reports for 7011.425 ha. i.e., 80.25% of total CAF area)	Not relevant	survival %	Area	Out of the 2184 ha plantations on revenue land only 193.432ha has been notified as protected forest. Remaining area is under process of transfer at different stages in GoMP
		> 50%	72% area	
		30to50%	15% area	
		below 30%	7.2% area	
		not reported	1726ha	
		fodder	339ha	

Progress may please be reviewed by the Members

(c) **COMMAND AREA DEVELOPMENT AND ENVIRONMENT MANAGEMENT OF DOWNSTREAM AREAS**

The command area of the project has been fixed on the basis of areas included by NWDT for purposes of considering requirement of Narmada water for irrigation. In Gujarat the GCA of the project is 3.43 million hectares of which Culturable command is estimated to be 2.12 million hectares. In Rajasthan for 0.30 million ha of GCA, Command Area Development Plan is required to be prepared and implemented commensurate with the development of irrigation in the command area. Stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India require that :

- (i) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and In the wasteland/vacant land under the control of the Irrigation Department
- (ii) A programme of drainage and ground water balance studies has been completed for Mahi Narmada-Doab. Such a programme must be completed for the areas beyond the Mahi. The Bhal, Saurashtra, Kutch. Sami-Harij and other areas require this as a pre-condition.
- (iii) The State should set up a special group of experts to study the siltation aspect in the main canals under all operating conditions since such siltation, if occurs, is likely to pose a serious problem during the actual operation of this project and may require a huge expenditure for desilting as well as result into serious operational difficulties.
- (iv) State should draw up a detailed time schedule for completion within five years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area of the total command of this project.
- (v) Past experience of Irrigation projects have revealed that main and branch canals are completed up to the end but, in absence of micro-level networks to take irrigation water up to outlet, corresponding Irrigation benefits do not start accruing In spite of huge financial investment made. To avoid this, the State should draw up an implementation schedule, segment wise, for completion of canal network, in such a way that a segment of the canal network, taken up from head reaches is completed in all respects so as to make the irrigation waters available, for the designed potential of that segment, up to the outlet In that particular segment.

With the attainment of height of EL 110.64m water would be available for the irrigation of Phase-I area of the command in Gujarat for which.

- o Command Area Development Plan for the Phase-I would be required. Implementation of the water delivery and drainage system along with implementation of the measures proposed in the plan for safeguarding the environment would be required.
- o Downstream requirement for drinking, health, flora and fauna salinity ingress, breeding of fishes, water quality, etc., are required to be addressed.

Status of the Planning and Implementation aspects is presented below :

<b>Gujarat</b>		
Submission of the Plan	<p>CAD plan has been submitted for Phase-I in Gujarat  The command coming under Phase - 1 extends up to Narmada-Mahi Doab and areas coming under this belong to agro-climatic zone no 1 to 4.  Awaited for Phase-IIA and IIB in Gujarat  Awaited for area in Rajasthan</p>	
Development of water delivery and drainage system	<p>Construction of Canal Phase -1 Ch 0.00 Km to 144.500 Km (Mahi crossing) along with the distributaries have been completed in all respects. Construction works in the reach between kms., 144.500 and kms., 263.165 i.e., NMC Phase-II-A have been completed in all respect.  The construction works in the canal reach between kms., 263.165 and kms., 388.164 i.e., NMC Phase-II-B are in advance stage of completion. Awaited Surface drainage is being provided up to 40 ha chaks concurrently with the construction of canals.  The work of survey investigation, planning, designing and estimating up to 40 ha. (macro planning) for 52 blocks has been completed in Phase-I. The work of survey, investigation, planning designing and estimating below 40 ha. (micro planning) for 52 blocks (excluding the four blocks falling under Bara tract) has been completed. Total 204 distributaries having length of 1166 km. and 1635 minors having length of 4766 km. have been planned under the area of 52 blocks. Out of these, total 819 km. length of distributaries and 1419 km. length of minors have been completed up to June, 2003</p>	
Implementation of environment safeguard measures	<ul style="list-style-type: none"> <li>▪ Conservation of bio-diversity Establishment of Botanical Garden</li> <li>▪ Development of aqua culture</li> <li>▪ Health plan</li> <li>▪ Water quality monitoring</li> <li>▪ Limiting the uses of pesticides / weedicides</li> <li>▪ Measures to contain water logging / salinity / alkalinity</li> <li>▪ Conjunctive use of water</li> <li>▪ Engineering measures ( vertical and horizontal drainage works)</li> <li>▪ Installation of Piezometers</li> <li>▪ Agriculture development works (On farm / Off farm)</li> <li>▪ Infrastructure / industrial development</li> <li>▪ Special provisions for Bhal and Bara tracts</li> </ul>	Progress awaited.
	<ul style="list-style-type: none"> <li>▪ Canal side plantations (15,000 ha.)</li> </ul>	Plantations raised on 2,900 ha.
<b>Rajasthan</b>		
Initial plan was submitted during 1990	Sub-group directed for revision & EIA studies.	
EIA studies	Completed by WAPCOS. Area to be irrigated was increased	
Preparation of the Plan through ICCB	Plan submitted by GoR and circulated to the Members for a review	

During 38<sup>th</sup> meeting of the Sub-group, the Command Area Development plan for Phase-I, was submitted by the Govt., of Gujarat. This plan was circulated vide NCA letter dated 23.5.2003 for a review by the Members. During the 39<sup>th</sup> meeting, GoG was directed to submit a detailed plan for the entire command area within three

months time. Progress may be reported by the GoG. Command area plan for the areas in Rajasthan was received and circulated to the Members. The comments received from Secretary, SSCAC, placed at **Annex – XL (2)** were forwarded to the GoR. GoR may please present their views on the issues involved for the benefit of the Members.

**(d) FLORA, FAUNA, & CARRYING CAPACITY**

The guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora and fauna present can be assessed, listed (rare and endangered) species can be detected, if present, and appropriate conservation measures devised.

A condition of this clearance, as far as it related specifically to the Flora & Fauna, was that the Narmada Control Authority would ensure in-depth studies on flora & fauna needed for implementation of Environmental Safeguard measures. The issues identified with respect to submergence area were identification of rare & endangered species, habitat sufficiency. Accordingly, the rehabilitation of flora fauna action plans were expected to cover the Surveys of flora & fauna in the region going to be affected due to implementation of the SSP with reference to the following

- 1) Gene pool, if any, likely to be affected.
- 2) Details of wildlife habitat in the region
- 3) Measures proposed to rehabilitate endangered species of flora fauna, if any.
- 4) Assessment of the carrying capacity of the neighbouring areas wherein the wildlife would dispose if the scheme were implemented.
- 5) Plan for rehabilitation of endangered flora & fauna.

**Status of Implementation**

<b>Maharashtra Areas</b>		
School of Environmental Sciences, University of Pune:		
	Recommendation	Status of implementation
1.	Management of corridors for shifting of wildlife, several corridors, passing through moderate to good (0>3) vegetation cover.	Due to thick vegetation growth resulting from the CAT programmes special management for the corridors was not considered essential. However, this is also considered under routine management by the state forest department

2.	Tree species with high diversity in the region (e.g. <i>Buchanania lanzan</i> ) should be conserved on large scale, in the form of multi-region seed banks. Some of these seeds from each variety, should be planted in iso-climate regions, with care, if such regions fall in degraded areas.	Buffer zone plantation in 500 m width around the wetland area of the reservoir awaits implementation
3.	Seed bank status of soils of low-lying (e.g. valley bottoms) areas having found to be good hence; it is suggested that surface soils from such areas be used to develop vegetation (natural) in degraded areas	To be established with the help of Forest Protection Committees working in the remote tribal areas of the Satpuda ranges, voluntarily without any cost
4.	It is further suggested that these soils should be deposited, rather than spread thin at the end points of transformation, to facilitate diverse vegetation growth, comparable to natural vegetation.	<p>Catchment area treatment programme was implemented during 1992-1998 over forest area of 20283.48 ha. This man made forests was flourishing successfully</p> <p>It was assured by GoM to follow the suggested recommendations during implementation stage.</p>
5.	It will be futile exercise to concentrate on one or other methods for conservation of soil since there are various types of terrains. Therefore, it is necessary to go in for a combination of more than one method as locally feasible. Small storages of run-off water, should be aimed at	
6.	Based on the abundance of vegetation growth in different terrains such as vegetation along the crevices and slopes, suggestion is made to use these species with spreading habit which are already identified from this area could be effectively used for soil conservation and to develop microhabitats on difficult terrain. Such efforts will form a pioneer stages of secondary succession on distributed habitats, help to consolidate the substratum and pave the way for further regeneration on steep slopes and areas with poor soil cover.	
7.	Efforts should be made to encourage conservation of soil on slopes and crests and restore adequate soil cover on undulating grounds, through deposition of soil, restoration of degraded lands, formation and retention of plant cover and eventually improvement of water potential. Reciprocally supplementary phenomena of improvement of high diversity vegetation cover and soil potential should be exploited and encouraged through meticulous planning and its execution. This for ultimate aim of improvement of carrying capacity of the region.	

Gujarat Areas :		
1.	In order to protect our damaged ecosystems and to restore them to health it is necessary to undertake development programmes in rural areas, that regard natural watershed and all the communities in it as a unit, improve hydrological regime of the unit, institute rational land use planning, undertake reseedling programmes, and induce each unit of the state to solve its own problems rather than transfer its biotic load to other unit. Equally important steps are those of putting these areas on strong cash economy, training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state. Availability of trained manpower from these regions is likely to prove a boon to further economic development of the state and in its absence, either plans will be seriously flawed or the state will have to import trained people from outside while leaving its other citizens in poverty. An independent monitoring and evaluating infrastructure is an absolute necessity for successful execution of these strategies and action plans.	<p>Entire catchment Over 30,000 ha area of Narmada river in Gujarat was treated up by soil moisture conservation measures. This included reforestation over 27204 ha area.</p> <p>In addition the area of Dhumkal sloth bear sanctuary was enlarged 4 times and now known as Shoolpaneshwar sanctuary. The sanctuary management plan was drawn up and was under implementation</p>

Madhya Pradesh Areas State Forest Research Institute, Jabalpur		
1.	Catchment protection work both engineering and biological coupled with shifted forest management. Reestablishment of indigenous forest ecosystem and local diversity.	The catchment area treatment plan covering 125725 ha area is under implementation. Areas treated by the end of September 2003 covered 64745 ha in non-forest land and 44600 ha in forest land.
2.	Production of fodder through agro-forestry or silvi-pastoral system through management of village wastelands.	
3.	Production of bamboo through agro-forestry.	Covered under CAT as well as under Social Forestry Programme.
4.	Using state-of-art technology for devising the management plans for the forests under study area with special reference to protection from fire and stringent control of grazing in the development area.	The working plans covering these issues were under implementation by the State Forest Department.

5.	Intensive campaign for forestry-cum-environment awareness, peoples participation backed by development legislation should also be launched.	Joint Forest Management & Social Forestry schemes are being run by the State Forest Department. These schemes have adequate involvement of local people. Peoples participation is sought while carrying out CAT works.
6.	To cater to increase requirement of timber, fuel-wood etc. Social forestry programme should simultaneously be launched.	Social Forestry programme is under consideration of the State Forest Department. Social Forestry Plan of Rs. 5.60crores has been approved by NVDA on 02-10-2003.
7.	Introduction of quick growing exotics in interest of soil stabilization and meeting the requirement of people in short time.	
8.	The area is stated comparatively scarce in wildlife with no species that was endemic but to provide alternate habitat for the wildlife two sanctuaries namely Mathwad (34659 sq. km.) in Jhabua district and Bokrata (3559 sq. km.) in Khargone district were proposed.	No action is taken so far.
9.	60 islands which will be found in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.	Recommendation would be taken up in time for implementation
10.	Studies of the forests with particular reference to topography physical and chemical properties of the soil and soil moisture regime are necessary.	Not considered necessary by Govt. of Madhya Pradesh.

Up-to-date progress may please be presented for review by the Sub-group.

#### Aquatic Fauna Fisheries:

Requirement by MoEF / Sub-Group	Recommendation by CICFRI	Gujarat	Maharashtra	Madhya Pradesh
Gene pool, if any, likely to be affected.	8 species considered vulnerable	Plan included Measures for vulnerable species like Hilsa ilisha, Macrobrachium rosenbergii etc, taken	Revised plan received shall be put up to the HLEG for review	Plan to be revised to include measures for vulnerable species like Mahaseer, Rita pavementata etc
Details of wildlife habitat in the region	Breeding habitation and places identified.	Existing plan included this aspect		Office of DD (F) established at Barwani, details of works awaited

Measures proposed to rehabilitate endangered species of flora fauna, if any.	Measures for rehabilitation of endangered fauna delineated	Hatcheries established & reservoir was being stocked		CICFRI was to be requested for inclusion of identified vulnerable species for developing rehabilitation methodology for those species it is yet not available. Results were to be included in the revised plan , it is awaited.
Assessment of the carrying capacity of the neighboring areas wherein the wildlife would disperse if the scheme were implemented	Certain studies on water quality, prey predator relation, carbon nitrogen ratio etc were suggested	Results of water quality studies upstream, downstream & estuary available with CICFRI & Pollution Control Board	Studies entrusted to CICFRI likely to be completed by Dec. 2004	Limnological studies were completed. Long term hydro biological monitoring was to cover, identified parameters for water quality monitoring. This is expected to be cover in the revised action plan.
Plan for rehabilitation of endangered flora & fauna.	Guidelines by the HLEG on the anvil	Existing plan to be revised		Existing plan to be revised

Further progress shall be reported during the meeting.

### **Felling of the Forest from the submergence area**

Plans for felling of trees in the forest area coming under submergence to avoid the possibility of animals being trapped in the submergence area, prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc. were required for the areas in Gujarat, Maharashtra & Madhya Pradesh. Forest areas were required to be taken up for felling in a systematic manner to avoid any possibility of the same.

### **Maharashtra**

In Maharashtra the forest area of 6,488 ha was diverted for submergence of which 3,157. 03 ha was forest. The balance area was under river bed, nallah etc. Of this 2288.63 ha lied between 90 m & up to four meter below the FRL.



	Akkalkua Tehsil		Akrani Tehsil		Total		
	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Balance (ha)
Between 90-100 m	220.14	140.74	232.53	232.53	452.67	373.27	79.4
Between 100-110 m	239.72	157.10	515.73	14.11	755.45	171.21	584.24
Between 110-121 m	153.25	Awaited	460.05	Awaited	613.30	Awaited	Awaited
Between 121-34.68m	117.82	Awaited	349.39	Awaited	467.21	Awaited.	Awaited

### Madhya Pradesh

Felling in entire forest area coming under submergence is completed except 23,318 trees in non-forest area up to FRL as shown below:

Districts	Forest Area			Non Forest Area		
	Total No. of trees to be felled	No. of trees felled	Balance	Total No. of Trees	No. of Trees Felled	Balance (No. of trees to be felled)
Jhabua	38,234	38234	Nil	3112	3112	Nil
Dhar	Nil	Nil	Nil	11,296	405	10,891
Badwani	14,771	14,771	Nil	16,530	4,103	12,427

### Gujarat

In Gujarat the forest area diverted was 4165.91 ha in addition 356.78 ha was diverted earlier. Thus in all 4522.69 was utilized for the SSP. Of this 4152.68 ha of the Distt. Vadodara and Bharuch required felling. The felling in Gujarat was reported to be complete and that even the coppice crop was also removed.

### (e) SEISMICITY AND RIM STABILITY

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. Although there are no specific stipulations on aspects of a seismic dam design in MOEF Clearance Order, dam design in India is regulated by a national standard developed by the Bureau of Indian Standards (BIS). The BIS has classified the Indian sub-continent into 5 zones depending on tectonic, geologic and seismic consideration using available data. The River Narmada lies in the seismo-tectonic provinces of Cambay Basin and Peninsular Shield (including the Deccan Trap) and comes under Zone 3 of the BIS classification.

Moderate seismic activity has been recorded in the Cambay Basin (up to 5.4 on the Richter scale) although the majority of seismic events in the dam vicinity have been of sub-zero magnitude. Rim stability refers to the competency of reservoir base rocks to maintain natural slopes and to contain the stored water. Under stable conditions, there should be no significant losses of reservoir water due to ground water percolation or seepage. Where rocks are found to be highly permeable, mitigation measures are needed to ensure the longevity of the reservoir.

The GOG appointed a Dam Review Panel, comprising engineers and geologists, to evaluate the report and findings and a revised final report was submitted to the project authorities in 1982. The main mitigation measures suggested were as follows :

- Construction of dams and Infrastructure (Incorporating seismic design coefficients) to withstand the maximum credible earthquake
- Establishment of seismic monitoring stations at key locations around the reservoir

ACTION	STATUS
Dam design modifications <ul style="list-style-type: none"> <li>▪ Adoption of horizontal design coefficient of 0.125g on the recommendation of the Dam Review Panel</li> <li>▪ Installation of stress monitors in the main body of the dam</li> <li>▪ Increase of the depth of the foundation to 18m below the lowest riverbed.</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ GSI (Nagpur Division) Rim Stability studies</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ Tracer Studies by CWPRS</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ Monitoring stations</li> </ul>	Rim stability studies have been completed and well equipped 9 monitoring stations along with periphery of the reservoir 4 each on either side and one at the downstream of the Sardar Sarovar reservoir. Out of a total of 9 stations, 3 in M.P. (Alirajpur, Kukshi and Badwani, 1 in Maharashtra (Shahada) and 5 in Gujarat (Kawant, Naswadi, Kevadia, Jitgaon
<ul style="list-style-type: none"> <li>▪ Results of analysis of data from monitoring stations.</li> </ul>	Received, analysed by the dam safety review panel of the SSP during October, 2001.

Earlier it was considered desirable to upgrade the instruments for which a proposal was being worked out by the SSNNL in accordance with the suggestion of

the IMD. Progress may please be presented. During the last meeting the issue was discussed and the necessity for constant recording and analysis of seismic data was stressed. The review of the data done by the Dam Safety Review Panel as assured during 39<sup>th</sup> meeting may please be informed.

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, a specific requirement for the SSP contained in the environment clearance order of GOI was that the plans for the provision of health facilities to workers and residents of the affected areas should be prepared. Each State should take necessary measures to minimise the risk of malaria, filarial, schistosomiasis and other diseases associated with water that may result from implementation of the project. Preparation of an Action Plan for the surveillance and control of malaria was also stipulated.

As per the further directions received from the MoEF, the states were required to take up measures given in the following table.

	Mitigation measures	Gujarat	Maharashtra	Madhya Pradesh
1.	Present status of the waterborne disease in the areas	Completed		
2.	Screening arrangements proposed for the work force;	Completed	Not relevant	Not relevant
3.	Epidemiological Surveillance studies	Completed	Phase-II study yet to start	Completed
4.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases	Action plan under implementation	Revised Action plan awaited	Action plan revised Aug. 2003
5.	Reinforcement proposed to the existing health delivery system commensurate with height of 110.64 m RL.	Completed	Incomplete	Incomplete
6.	Surveillance of diseases	Progressing	Weak . Being implemented under M.H.S.D.P. Use of computer to record and compile the data at district level	Weak
7.	Standard formats available with the NICD to be used for diseases surveillance purpose.	Progressing	Format circulated, implementation awaited.	Awaited

8.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	Progressing	Awaited, two water quality labs working , four being operationalised. Pada Workers are appointed to perform house to house disinfections with the help of Mediclur	Awaited
9.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.	Progressing	Awaited	Awaited
10.	Regular Entomological monitoring is suggested for alterations in ecology of the area due to irrigation / impoundment.	Progressing	Awaited, preventive measures planned.	Awaited
11.	It is suggested that sanitary latrines be established at the R&R sites and  Villagers may be educated to use these to keep the cases of Gastro diseases in check.	Progressing	Awaited Health Department is performing IEC activities to educate the people.	Awaited
12.	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited	Awaited	Awaited

The status of compliance on each of the key requirement may be discussed and reviewed by the Sub-group.

#### (g) ARCHAEOLOGY & ANTHROPOLOGY

In addition to the general obligation of the States under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out below.

- 1) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- 2) Plan for rehabilitation of monuments wherever necessary

The current status of the protection / relocation works is presented below

		Gujarat	Maharashtra	Madhya Pradesh
Monuments	FRL	2 ( 2 completed)	Nil	23(4)
	Commensurate with 110.64			NVDA assured that no approach shall be impacted
Mounds	FRL	Nil	Nil	15(9)
	Commensurate with 110.64			Not likely to be impacted
Museums/ Park	FRL			4 ( 1 completed)
	Commensurate with 110.64			Not relevant

Further progress may be informed for a review by the Sub-group.

#### (h) DOWN STREAM ENVIRONMENT

The construction of dam would result into more regulated and perennial flow into the river with an overall beneficial impact. It is unlikely that any significant negative environmental impacts will occur in the downstream areas over the next 30 years due to this project. Some possible adverse effects might manifest during raising the dam height further to EL 110.64m. The key points are outlined below for review by the Sub-group.

- Period of progressive filling is required to be kept at the minimum for which release from the upstream reservoir has to be ensured at the appropriate time.
- While raising the blocks water level has to be lowered from its present level and while refilling, there would be time lag of 10 to 15 days depending upon the hydrology and timing of flow. Arrangements, therefore, have to be made for providing adequate supplies of water for downstream users and also to contain the salinity ingress up to the observed limits.
- Sudden release of water from the dam might catch some people unaware and they might be washed down and, therefore, arrangements have to be made for providing adequate sign boards at appropriate places and all necessary arrangements to warn the people.
- Arrangements would also be required to protect fishing in the deep pools downstream of the reservoir during these days to protect aquatic organisms taking shelter there.

- Control measures would be needed to contain mosquito breeding in small ditches that would be formed downstream of the reservoir during the period of filling.

During the 39<sup>th</sup> meeting the Chairman directed submission of formal plan for maintaining down stream flows and that it should contain detailed analysis of the requirement of down stream users and monitoring of down stream should also be ensured. A copy of the plan received in response is placed at **Annex – XL(3)**.

Adequacy of the steps taken by the State Govts. towards compliance of the conditions / stipulations/ directions/ recommendations of the Sub-group may please be reviewed by the Sub-group.

- C. Status of the compliance of the environment safeguard measures commensurate with raise in the height of the dam to 110.64m RL as desired by the Sub-group is presented below

To facilitate a review of the compliances on the suggestions as per discussions of the 39<sup>th</sup> meeting of the Sub-group :

	Decision of 39 <sup>th</sup> meeting	Gujarat	Maharashtra	Madhya Pradesh				
Catchment Area Treatment Physical Targets	Entire phase-I to be completed by end of December, 2004	Completed	Completed	<table><tr><td>Targets</td><td>125725 ha.</td></tr><tr><td>Achievements</td><td>110712 ha</td></tr></table> 88% completed	Targets	125725 ha.	Achievements	110712 ha
Targets	125725 ha.							
Achievements	110712 ha							
Felling of trees	Entire tree growth from the submergence area should be removed before commencement of impoundment and report should be presented before the next meeting of the Sub-group	Completed	Felling in 663.64 ha forest area is yet to be taken up.	<ul style="list-style-type: none"><li>o Completed in forest area.</li><li>o Trees in non forest area are to be felled.</li></ul>				
Flora Fauna		Progress on development of Sanctuary: Satisfactory	Plan for plantations in the buffer zone is yet to be implemented	Draft plan is yet to be finalised and implemented.				

<b>Carrying Capacity</b>		Estimated for sanctuary being ensured through sanctuary development	Not estimated but being ensured through CAT & CAF	Not estimated but being ensured through CAT & CAF.
<b>Fisheries Conservation Aspects</b>		Draft plan available. Implementation progressing	Revised plan submitted	Revised plan awaited.
<b>Downstream Environment</b>	Detailed plan to be submitted	Plan received is annexed for review for adequacy	Not required	Not required
<b>Command Area Development</b>	GoG to submit detailed plan for the entire command within next 3 months	Detailed plan to be prepared.	N.A.	N.A.
<b>Health</b>	Addl. Facilities as required must be provided and monitoring reports should also be available before the next meeting. Data to be put up on the web site.	Monitoring report awaited and progress on placing data on the web site awaited	Progress Awaited	Progress Awaited
<b>Seismicity &amp; Rim Stability</b>	Collected and analysed data was to be reviewed by the Dam Safety review panel.	Progress Awaited		
<b>Archaeology</b>	Relocation at Choti Kasrawat was to be completed by January, 2004	N.A.	N.A.	Awaited.

In view of the above, members may like to discuss & review.

**Item No. XL-3(186): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES INDIRA SAGAR PROJECT :**

**A. CONSTRUCTION SCHEDULE:**

Indira Sagar Project (ISP) formerly known as Narmada Sagar Project has an installed capacity of 1000 MW and annual irrigation of 1.69 lacs ha. The project is very crucial due to regulated releases of 8.12 MAF of water from this project for SSP.

After getting necessary clearances the construction works were started in May, 1992 and the dam was targeted to be completed by June, 2000. However, due to various reasons the progress lagged behind. Subsequently, the work was handed over to Narmada Hydroelectric Development Corp. (NHDC), a Joint Venture of Govt., of Madhya Pradesh and National Hydroelectric Power Corporation. The targeted date of completion has been revised to May 2005. As per the available information the concreting was completed up to minimum 239.00m RL in the central overflow portion whereas non overflow side blocks were raised up to 266.25m RL. According to the schedule of construction, concreting was to be completed up to RL 245.13m by January, 2004, in the overflow portion. Accordingly the ISP would submerge an area of 91,000 ha. by December, 2004 and consequently would impact the land, Flora and fauna etc.

Month / year	Level in m	Submergence area in ha.	% in relation to FRL
level as on February, 04	239.00	16,069	17.66
Level as was proposed to be attained by January, 2004	245.13	28,600	31.43
December, 2004	MRL	91,000	100



**B) Current Status of Implementation of the Environmental safeguard measures for the Indira Sagar Project is presented below for a review by the Members**

**(a) CATCHMENT AREA TREATMENT (in ha)**

**1. PHASED CATCHMENT AREA TREATMENT (Area in Ha.)**

	Duration in years	Fund requirement in Rs Crores	Non-forest	Forestland	Total area	Cumulative progress
Phase-I	10		51,927	11,048	62,975	55,512
Phase-II	30	1038	806720	108430	9,15,150	18542

During 39<sup>th</sup> meeting, it was assured that the treatment of entire Phase-I area would be completed within the Calendar year 2004, further progress may please be reported.

Members may like to discuss & review.

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

Ministry of Environment and Forest vide letter No. 8-646-84-FC Dated the 7<sup>th</sup> Oct. 1987 permitted diversion of 41111.97 hectares of forest land in Khandwa, Dewas and Hoshangabad districts for the Narmada Sagar Multipurpose Project. under Section 2 of the Forest (Conservation), Act, 1980, subject to the following key conditions that

1. Compensatory afforestation will be carried out over suitable degraded forest land double the diverted forest area in extent and in addition to the equivalent area in non-forest land. However subsequently the scheme for compensatory afforestation submitted vide letter Nos. F.D /AAA/ AO/3 dated 13.11.1987, as detailed below was approved by the MOEF . However additional compensatory afforestation over 150 ha. degraded forest was directed.
2. The areas will be surveyed, demarcated and declared protected forests and placed under the control of the Forest Department for compensatory afforestation at the cost of the project. Areas not found suitable will be substituted by suitable area.
3. Forest clearance was to be done only upto 4 M below FRL

District	Area in hectares diverted for ISP	CA target in Degraded Forest	CA target in non forest area	Total target in ha.
Khandwa	33,383	30,572	2,314	32886
Dewas	4,528	17,491	802	18293
Hoshangabad	3,678	22,739	2,842	25581
Sehore		-	1,247	1,247
Dhar		-	1,001	1,001
Khargone		-	1,937	1,937
<b>Total</b>	<b>41,589</b>	<b>70,802</b>	<b>10,143</b>	<b>80,945</b>

Progress reported (in ha) : Forest=70,022; Non Forest=10,337; Total=80359

During the 39<sup>th</sup> meeting, it was assured that the plantations under balance degraded forest area of 600 ha. would be completed soon. Progress may be reported.

**(c) COMMAND AREA DEVELOPMENT AND DOWNSTREAM CONSIDERATION**

The project on completion will provide annual irrigation to 1.69 lakh ha. The Command area comprises Forest:10,055ha; Grasses and pastures:10,498ha; Cultivated land: 142,406ha; Culturable fallow : 8,116 ha; Barren:18,385 ha. As per direction of the Planning Commission, project proposals are required to include the command area development plan also. MoEF clearance of 1987 also required it. The forest clearance stipulated that tree planting should also be done on either side of canal road and foreshore of the reservoir and in the wasteland / vacant lands under the control of the Irrigation Department in the command area. The key conditions attached with the investment clearance were as follows.

- o The State shall comply with the conditions as laid down in the O.M.No.3-87/80-IA dated 24.6.1987 and letter No.8/646/84-FC dated 7.10.1987 both issued by the Ministry of Environment and Forest while according the environmental clearance and the approval for diversion of forest lands for this project respectively for this project and ensure completion of Rehabilitation and Resettlement Plan in scheduled time with close monitoring as per requirements of Department of Environment and Forest.
- o State will establish adequate network for ground water monitoring in the command within 2 years and the State should submit to Planning Commission the time frame for establishing such network with mile-stone achievements, duly vetted through Central Water Commission, for monitoring the same by Planning Commission

- State should draw up a detailed time schedule for completion within 5 years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area ( Not already submitted) of the total command of this project.
- The State should draw up an implementation schedule segment-wise for completion of canal network, in such a manner that a segment of the canal network, taken up from head reaches, is completed in all respect so as to make the irrigation water available, for the design potential of that segment upto the outlet in that particular segment;

The Government of Madhya Pradesh have submitted command area development plan, delineating the soil classifications and land irrigability in the Narmada Sagar Command Area showing the first three phases of irrigation development by area, the land irrigability map of the Narmada Sagar Command Area during 1986. Accordingly the implementation of the plan was to be taken up in three phases for completion by December-2007. The subgroup directed updating of this plan in line with the plans being developed for the SSP in Gujarat and Rajasthan.

1. To revise and update this plan, GoMP have constituted a multi-disciplinary expert group. Two meetings were held and detailed draft TOR's have been drawn up by the committee. Further developments may please be presented
2. The study on impact of Agro chemicals, runoff from fields on surface & ground water quality in the command area was assigned to J.L. Agricultural University, Jabalpur. Results may please be presented
3. However the progress on the canal system is very slow. Earth work has been completed only in the first 28 kms of the main canal and mostly completed in another 13.25km length. Work for most of the distributaries is yet to be started. Progress may please be presented

During the 39<sup>th</sup> meeting, the Chairman directed NVDA / GoMP to keep MoEF / ESG informed in advance of stopping flows down stream henceforth as it might have serious environmental consequences. NVDA may please present the updated progress on preparation and implementation of the Command area development plan for a review by the subgroup.

**(d) FLORA, FAUNA, & CARRYING CAPACITY**

The submergence of forestland will result in the creation of new and regenerated forest habitat, the establishment and improvement of wildlife sanctuaries, the greater availability of fresh water for irrigated forestry or for wildlife. The MOEF conditions for clearance, as far as they related specifically to the Flora & Fauna, were essentially the same as brought under Sardar Sarovar Project.

The objective of the suggested studies was to assess the environmental impacts as a result of the Narmada Sagar Complex, consisting of the three dams: the Narmada Sagar, Maheshwar and Omkareshwar, to ensure minimal adverse effects on wildlife as a result of the project development works. Studies were entrusted to Wildlife Institute of India, Deheradun, Friends of Nature Society, Bhopal, Limnological studies to the Universities (Jabalpur, Ujjain & Bhopal). These institutes carried out studies with a view to address the above concerns and recommended certain mitigation measures, which included the following.

1. Key aquatic vertebrates species like **otter** was proposed to be restored and translocated. It was suggested to explore the possibility of capturing and translocation of impacted otters of Narmada Sagar into identified localities of the vacant niches in central Indian rivers.
2. Besides, a species restoration plan for **aquatic reptile (turtle)** was also suggested within the submergence zone and also in other stretches of the river with rocky structure and sandy banks.
3. The restoration program for **muggar crocodile** as being practised in other districts of M.P. was also suggested.
4. The studies of certain aspects of fisheries and reservoir sciences have been included in the Limnological studies being conducted by the three Universities of the State.
5. Since the topography in the reservoir area consists of rolling hills, the higher peaks to remain above the water surface level and constitute islands in the reservoir. In addition to these small islands, two large islands will be formed to the north and south of the Narmada River just upstream of the Indira Sagar Dam. These islands were required to be protected. As per suggestions of the Sub-group NVDA had presented a plan for protection which was required to be implemented
6. It was suggested that the severity of the impact resulting from direct and indirect losses could be minimised through restoration of some of the aquatic vertebrates and delineation of a substantial area of the contiguity forest which has similar conservation values that are being lost in submergence and to elevate its status to a protected area – a combination of a national park and sanctuary. Three new protected areas were proposed to mitigate the losses.

This included Narmada National Park, Suryanmaya Sanctuary and Omkareshwar Sanctuary, as per details given below.

<b>Name of the Sanctuary/Park</b>	<b>Area in ha.</b>
Narmada National Park	47522
Suryamanya Sanctuary	16370
Omkareshwar Sanctuary	11996
<b>Total Area</b>	<b>75888</b>

As per information received from NVDA vide their letter dated 15.10.2003 necessary administrative formations viz. offices of Director, Omkareshwar National Park and Superintendents, Surmanya / Mandhata Wildlife Sanctuaries together with the necessary staff for day-to-day management of these protected areas to ensure protection to the wildlife taking shelter there, have been established .

A plan for felling was also required to ensure protection to wildlife. However, more than 15,000 ha. of the forest had already been clear felled till January 2003 impacting flora and fauna.

Considering the above, the Sub-group during 38<sup>th</sup> meeting held on 10.3.2003 requested GoMP to initiate the process immediately for implementation of the recommendations within five months period, however, a proposal is yet to be put up to the State Cabinet for a consideration / decision.

During the 39<sup>th</sup> meeting, the Chairman suggested that the NVDA should keep the ESG informed of progress / result of the decision of the State Cabinet on notification for the National Park and Sanctuary.

Present position may please be indicated for a review by the Sub-group.

**(e) SEISMICITY AND RIM STABILITY**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. The MOEF conditions for clearance, as far as they related specifically to the Seismicity and rim stability , were essentially the same as brought under Sardar Sarovar Project.

The Narmada Sagar reservoir has a gross capacity of 12,200 million cubic meters, or about 9.9 million acre-feet, by far the largest-capacity reservoir planned in the Narmada River basin. Therefore the issues of Seismicity and the potential for

reservoir-induced seismicity (RIS) were required to be attended as per recommendation of the dam safety review panel, Central Water and Power Research Station, (CWPRS) Pune and Indian Meteorological department (IMD), which suggested:

- To monitor seismicity during the pre and post-impoundment phases. Network of about five stations each be developed in the Narmada Sagar, Omkareshwar, and Maheshwar areas .
- To record the ground motion intensity and response of the dams for any significant earthquake in the vicinity, installation of three strong motion seismographs at each dam site.
- To record any significant ground motion that occurs during construction, one strong motion instrument near each dam site.

Accordingly, zone a network of 10 seismological observatories with sophisticated instruments was being established. It was proposed to monitor pre and post impoundment seismicity also at these seismic stations to help in assessing the adequacy of seismic parameters adopted for designs. The location of these seismic observatories was as under:

1. Bagli	2. Barwani	3. Chhanera	4. Hirapur	5. Umrik heda
6. Kannod	7. Khandwa	8. Maheshwar	9. Narmada Nagar	10. Kothi

At present, in addition to one unit at Pandhana near Khandwa to monitor local activity in and around Pandhana, three experimental seismological stations have been established with the guidance of Central Water & Power Research Station, Pune, in the project area at Narmada Sagar, Omkareshwar and Maheshwar dam sites and the results are analysed by the Central Water & Power Research Station, Pune and IMD. Details may please be presented.

During the last meeting, it was observed that only Narmada Nagar and Khandwa observatory were fully functional and setting up of the sophisticated instruments at other observatories was making progress. Present position on installation of the instruments for making the recommended sites functional may please be presented.

During the 39<sup>th</sup> meeting, it was assured by the NVDA that the data collected at the monitoring stations was being analysed at the identified institutes. Progress may please be presented.

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, specific requirements for the ISP contained in the environment clearance order of GOI were essentially the same as brought out under the Sardar Sarovar Project

The Indira Sagar Project would create a 913 km<sup>2</sup> reservoir, a main canal of 332 km. and 1,820 km of distributaries. Surveys and investigation of the existing levels of health, information on specific diseases besides implementation of the planned measures in time were required in accordance with the order of clearance.

Three specific diseases namely Malaria, Schistosomiasis, and Filaria were studied and diseases like leishmaniasis, scabies, etc., were investigated. The geographical reconnaissance study, to identify the potential breeding sites of malaria vector, was suggested. Other key suggestions included

1. Measures to control schistosomiasis should include physical, chemical, and biological means. The biological mitigation measures would include the use of predator species that would eat the secondary host snails.
2. Since the Anopheline mosquito vector has the potential to proliferate in the reservoir, the large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Some experimental resistance of adult mosquitoes to commonly used biocides was noted under laboratory conditions. Thus research to maintain effective biocides was to be continued on long term basis. Land leveling and land filling operations as well as appropriate vegetation clearing are being integrated. Control measures was to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites.

In pursuance the NVDA was required to update and revise plan on health aspect for ISP in addition for the geographical reconnaissance study. The salient features of the revised plan may please be presented for benefit of the Members.

Pre-revised plan included establishment of a 30 bedded hospital at Punasa and other facilities. One well equipped laboratory for long term hydro-biological monitoring has been established at Barwani. A medical unit with 20 bedded Hospital for workforce of ISP, besides one sub health center at Saralya was completed and the work on three Ayurvedic Hospitals at R&R sites was making progress. During 37<sup>th</sup> meeting of the Sub-group held on 8<sup>th</sup> February 2002, while discussing the field visit report of the experts on Health, it was requested by the NVDA to include an expert from the Department of Indian Systems of Medicines. The issue of adequacy of the diseases surveillance by the Ayurvedic Doctors as per allopathically designed system of surveillance by the NICD may be discussed.

During the 39<sup>th</sup> meeting, it was assured by the NVDA that draft plan for the up-stream area was almost ready and that the heal issue for the areas in command would be included in the CAD plan.

#### **(g) ARCHAEOLOGY**

In addition the general obligations of the State under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out under the Sardar Sarovar Project

Investigations of the basin revealed that valley was rich in archaeological belongings. A survey of the 254 villages for identification of the archaeological monuments falling within the submergence area was carried out by the State Department of Archaeology and Museum, Bhopal. The current status of monuments is as below.

- 254 villages surveyed for identification of Archaeological monuments coming under submergence.
  - 8 Nos. of monuments have been identified which require relocation/ protection.
  - 153 statues have already been collected and preserved at Museum at Dewas, Hoshangabad and Khandwa.
  - Shiv Mandir Dharikotla has been relocated to Sarlaya R&R site
- Progress on implementation may please be presented.



Archaeological Survey of India has also resurveyed 167 villages for identification of the monuments of significance. Further progress may please be presented.

Archaeological Survey of India have prepared a plan for protection of monuments coming under the submergence of Narmada Sagar Complex area. According to this plan, the well situated in the midst of north bastion of Joga Fort, a centrally protected monument, will be fully submerged at FRL + 262.10 M. However, this will remain submerged for 2-3 months during monsoon when reservoir might be at FRL. As far as backwater effect is concerned, the temporary rise due to backwater will be about 0.60 M near well, above HFL. Archaeological Survey of India had prepared an estimate of Rs.1.50 crores for construction of a wall to protect the in-take well. It was decided that NVDA will carry out the work through NHDC under supervision / guidance of ASI.

Further progress if any, may please be presented.

#### (h) ANTHROPOLOGY

The Narmada Valley can be divided into three physiographic units (1) Western Vindhyas (2) Narmada through West and South and (3) Western Satpuras. Some Indologists place the Narmada-Chambal civilisation of Malwa as a contemporary of Indus civilisation. Navada Toli is a site contemporary to Harappa where evidence of early farming villages were discovered. Findings of a hominoid skull from Hathnora indicated the possibilities of the existence of human bio-cultural remains within the basin. Excavation of the early historic mound in village Khedinama in Hoshangabad district was completed earlier during 1993-94. Ancient tools and artifacts were found. The entire area was scanned by the Anthropological Survey of India under Narmada Salvage Plan and some ancient tools have been found. NVDA has also planned to establish a Center on Religious and Cultural heritage of the Narmada Basin, initial discussions were held with the experts by the NVDA during the meeting convened for the purpose on 11<sup>th</sup> July 2003. Further progress may please be presented.

After detailed studies NVDA prepared a plan for excavation of five sites in District Dewas, Khandwa. Current status of excavation works on identified mounds is presented below:

EXCAVATION SITES	STATUS
Bijalpur Khurd, Khandwa	Completed
Chhalpa Kala, Khandwa	Progress is nil
Gajanpur, Dewas	Progress is nil
Nabalpura, Khandwa	Completed
Gannaur, Khandwa	Completed

During the last meeting, NVDA informed that permission had been received from the ASI for excavation of mounds and works on these mounds would also be completed soon.

Progress may please be presented.

**Item No. XL - 4 (187) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

**1. Phase-I Establishment of Silt Monitoring Stations.**

In pursuance to the recommendations of the Environment Sub-group for establishing silt monitoring stations to assess the efficacy of the treatment works Sardar Sarovar Narmada Nigam Ltd., decided to entrust this work to Central Soil & Water Conservation Research & Training Institute, Vasad. Studies carried out by the Space Application Research Centre, Ahmedabad through satellite imagery for the period 1985-86/ 1994/ showed that there was considerable improvement in the conditions of the catchment. Data pertaining to 2002 was got analysed and made available by the SSNNL.

Progress in this regard may be presented by the Govt. of Madhya Pradesh & Maharashtra.

**2. Phase-II Submission of Catchment Area Treatment Plans and implementation.**

As per the decision of the Govt. of India of July, 1992 State Govts. were required to submit schemes for treatment of critically degraded sub-watershed other than directly draining as Phase-II programme to the funding agencies for completion of work in a time frame to be determined separately. Available progress is presented below for updating by the concern states.

<b>Phase-II Plan</b>	<b>Area</b>	<b>Achievements</b>
<b>Govt., of Gujarat</b>	<b>657 ha</b>	<b>Completed</b>
<b>Govt., of Maharashtra</b>	<b>77,568 ha</b>	<b>20,861 ha</b>
<b>Govt., of Madhya Pradesh</b>	<b>3,18,118 ha</b>	<b>35,312 ha</b>

It was observed during the 35th meeting that due to decentralization of the funding components of the watershed management schemes and placement of funds at the disposal of the respective State Govts, needed steps should be taken by the

Sates for continued support to the soil moisture conservation works as envisaged. Steps taken by the States of Maharashtra and Madhya Pradesh may please be reported.

## **B. MONITORING WORKS IN MAHARASHTRA**

### **1. Funding of the works on implementation of action plans for mitigation of adverse impacts on environment**

Govt. of Maharashtra representative have expressed difficulties in receiving funds from the Project Authorities for implementation of the environment safeguard like Health, Fisheries, Flora, Fauna, etc. This issues is required to be resolved.

Members may like to discuss & resolve.

### **2. Agency for Inter Departmental Coordination for effective implementation of the plans in time :**

A number of actions are required on part of the Govt., of Maharashtra on the issues related to drawing up of the action plan on Flora & Fauna aspects, issues related with felling of the trees of the forest areas likely to be submerged by raising the Sardar Sarovar Dam to EL 100m and beyond, follow-up of the recommendations of the Committee on health which visited the areas in Maharashtra, The issues related to Phase-II surveillance of the diseases pattern within the impact area of the SSP. However due to lack of participation and follow up action or speeding up the works and for removing the bottlenecks focusing the issues on Govt., of Maharashtra was lagging behind. During recent discussions of the NCA officials with the Secretary (Environment), Govt. of Maharashtra, it was agreed by GOM to submit a proposal for establishment of an environment cell dedicated to Environmental Monitoring of the Sardar Sarovar Project. Present state of affairs may be reported by the GOM.

## **C. SARDAR SAROVAR PROJECT : ENVIRONMENT MANAGEMENT**

### **1. Publications**

During earlier meetings it was desired that good works being done by the Project Authorities are to be published . In response following publications have been brought out so far.

1. Birds of the Shoolpaneshwar Sanctuary and Narmada Catchment, Gujarat (India) by Dr. Sanat Chavan, published by Govt. of Gujarat.
2. Namada and Environment by NPG.
3. Heritage Flourshing in Narmada Valley published by Govt. of Madhya Pradesh.

4. Narmada River Basin Development: Indira Sagar Project "Environment Management" Published by Narmada Control Authority
5. Environment Safeguard : Sardar Sarovar Project: Published by Narmada Control Authority
6. A comprehensive draft document titled "Sardar Sarovar Project : Environment Management" prepared by the experts in Narmada Control Authority was circulated to the Members of the Sub-group in November, 2000 for their views. The suggestions were received from Govt. of Gujarat. These have been incorporated. It is proposed to publish the above document.

During the past meetings. the Sub-group was informed by the state Govt (s) that thrust areas have been identified and that publication would be brought out soon. Progress on these aspects may please be presented by the State Govts.

## **2. Seminar / Workshops**

During the 33rd meeting, the Sub-group desired that NCA should organise Seminar / Workshops on the "Thrust Areas of the Environmental Ameliorative Measures". Steps are being taken to organize the Seminar during 2004.

## **D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

In order to frame yard sticks on the cost estimates of the water resources Projects, the Chairman of the Sub-group during earlier meeting desired compilation of the estimates and expenditure incurred on survey, studies and implementation of the suggested safeguard measures for the SSP / ISP.

Updating of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level is requested from the Govts. of Gujarat, Madhya Pradesh and Maharashtra.

**Item No. XL5(188) : Any other item**

**Date and venue of the next meeting**

# ANNEXURES

FROM : S S N N L

PHONE NO. : 0091 02712 23049

**ANNEX - XL- (1)**

## Sardar Sarovar Narmada Nigam Ltd.

Block No. 12, 1st Floor, New Sachivalaya Complex, Gandhinagar-382 010. Phone : 3223518  
Fax : 079-3223049. E-mail : cio@sardarsarovardam.org, md-ssnnl@gujarat.gov.in

**S. K. Mohapatra, I.A.S.**  
Managing Director

SSNNL/Env/ESG-39/

April 8, 2004

Dear Shri *Suresh Chand*,Sub: Minutes of 39<sup>th</sup> meeting of the Environment Sub group.

Ref: Your office letter no Env-3(39)/2004/ 362-402 dated 16.1.2004

The minutes of the 39<sup>th</sup> meeting of the Environment Sub group circulated to the members of the Environment Sub group vide letter referred in above reads as follows;

"The Chairman ..... desired that detailed plan for entire command area should be submitted within the next three months time."

In this connection, it requires to be clarified that the development of command area should be pari-passu with the raising of the height of the dam, and therefore the detailed plan of phase-I of command area is required to be prepared within three months referred to in the minutes.

The letter no. SSNNL/Env/ESG-39/198 dated 1.4.2004 stands withdrawn.

With regards,

Yours sincerely

( S K Mohapatra)

Shri Suresh Chand  
Member (E&R)  
Narmada Control Authority  
Indore - 452 010



**ANNEX - XL - (2)**

भारत सरकार  
GOVERNMENT OF INDIA  
जल संसाधन मंत्रालय  
MINISTRY OF WATER RESOURCES  
सरदार सरोवर निर्माण सलाहकार समिति  
SARDAR SAROVAR CONSTRUCTION  
ADVISORY COMMITTEE

No : SSC/PB/Misc/2004/100

Dated : 3<sup>rd</sup> March 2004

To,  
Shri Suresh Chand.  
Member (E&R),  
Narmada Control Authority,  
BG-113, Scheme No. 74-C,  
Vijaynagar,  
INDORE

Sub : EIA of Project Narmada Water Allocation to Rajasthan

Sir,

Please find enclosed our comments on the Environment Impact Assessment and Management Plan of Narmada Project in Rajasthan for further necessary action at your end.

Yours faithfully,

(INDRA RAJ)  
SECRETARY

25.02

has reply

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35

### **Comments on Environmental Impact Assessment Plan of Narmada Project in Rajasthan**

The Environment impact Assessment and Management Plan is part of of detailed project report for revised plan of utilization of Narmada Water allocated to Rajasthan.

The present project has been redesigned updating the earlier project, to take preventive measures against water logging and salinity in the command area due to application of water.

The strategy proposed is application of reduced water allowance with increase in the overall command area, monitoring of all the adverse conditions and taking corrective measures accordingly.

The report gives strategy and suggestion in regard to water management environment management, socio-economic and health parameters and monitoring mechanism.

#### **Our Comments :**

1. The calculations of irrigation water and ground water balance need to be explained more elaborately. The given calculations (Annex 3.3) do not give clear picture.
2. The water allowance etc. has been compared with Narmada Command in Gujarat and with the IGNP command. Can we have comparisons with some similar situation in the Israel where some pioneer works in low water application irrigation has been reported/published..

3. Question of Power availability for the irrigation has not been dealt. Also the pollution from pump sets etc. have also not been considered.
4. Power based sprinkler irrigation has also to be seen with respect to farm economics. It would be interesting to see the cost of inputs for 1 Ha of farm land and work out the financial B:C ratio of a farmer's enterprise.
5. The project should have made some comparative studies for the drip irrigation as against sprinklers.
  - (i) In the drip irrigation power consumption could have reduced.
  - (ii) Some local innovative techniques could have adopted to save energy.
  - (iii) Human labour could have been used for filling the water tanks and using drip systems.
  - (iv) It would have meant less application of water less health/environmental adverse effects.
  - (v) Need of bio drainage could be avoided with drip irrigation.
6. Concept of bio drainage also needs further investigation.
  - (a) Will biodrainage not cause loss of costly water and spread of humidity. Instead why not go for lesser water application.
  - (b) What effect bio-drainage have on soil salinity ?

7. Biological and ecological impacts need further investigation.

(a) IGNP command and similar ecological irrigation area in the Israel need to be studied for knowing the impact of increase in humidity and consequent spread of malaria and schistomiasis. Preventive measures can be adopted accordingly.

(b) Long term impact of water logging/ humidity on flora and fauna could create a disbalance with the existing ecological getting adversely affected with the spread of some harmful flora and fauna.

© Various measures described for management of adverse impact need to be cost effective.

(d) Can water logging and humid conditions be altogether be eliminated with still less water allowance and drip irrigation

8. Various irrigation techniques, policies and regulations have been described but the detailed implementation methodology has not been worked out. How the WUA would function/get motivated/trained, etc. has not been indicated.

**ANNEX - XL- (3)**



## **Sardar Sarovar Narmada Nigam Ltd.**

"A Wholly owned Govt. of Gujarat undertaking"

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Fax : 079-3223056

SSNNL/Env/ESG-39/ 16)  
March 11, 2004

To,  
The Director (Env)  
Narmada Control Authority  
Indore - 452 010

Sub: Follow up of 39<sup>th</sup> meeting of the Environment Sub group.

Ref: Your office letter no. Env-3(39)/2004/477-78 dated 4.2.2004

Sir,

Enclosed, please find herewith Downstream Environment Management Plan as a follow up of minutes of the 39<sup>th</sup> meeting of the Environment Sub group held on 26.12.2003.

With regards,

Encl: As above

Yours faithfully

(AM Parmar)  
Specialist Environment

## **SARDAR SAROVAR PROJECT**

### **Downstream Environment Management Plan :**

#### **Background :**

Sardar Sarovar Dam is a part of the series of projects whereby water from the Narmada river is to be diverted for agricultural, domestic and industrial use and to generate hydropower. The total land area of Narmada river just from the downstream of the dam to the estuary is only 10% of the total drainage basin area. Downstream of the dam, there are two tributaries, the river Orsang on the right bank of the river Narmada and Karjan on the left. A dam constructed across Karjan regulates the flow of the said river. Both the banks of the river are getting irrigated, the right bank as a part of the Sardar Sarovar Project command area and the left getting irrigation supply from Karjan and Tapti river schemes.

The main urban center is the town of Bharuch, which is a port situated on the right bank of the estuary. The degree of change in the river regime downstream is dependent on the type and pace of development that is carried out and this will dictate the level of environmental impact. Predictions about the future pace and type of development is complex question which can only be answered in terms of probabilities as the number of variables and the time scale for development are uncertain. The manner in which the reservoirs will be operated may vary from that presently envisaged and the area to be irrigated in the Kharif and Rabi seasons will vary from year to year. Moreover, power generation demands may become increasingly important as the area develops and water supply and industry demands will grow significantly over the next 50

years. The construction of the dam would result into more regulated and perennial flow into the river with an overall beneficial impact. It is unlikely that any significant negative environmental impact will occur over the next 30 years due to this project.

Flow condition during non-monsoon & monsoon periods:

Before the completion of Narmada Sagar Dam (i.e. progressively before 2010) could be as much as 10 BCM greater than the natural flows. However in case of extreme years situation may be different in the summer months of May and June. However with a hydrometric network in place and good reservoir management this could be tide over. In most years it can be concluded that the flow should be greater than the maximum recorded in the last 30 years during the non-monsoon period.

During the monsoon period, flows downstream will be little changed from those experienced in the past although peak annual flow will be lower.

Regeneration flows:

It has been considered that the regenerated flow from the irrigated land together with the flows from the tributaries downstream of Sardar Sarovar including Karjan would provide adequate downstream flow. It is estimated that during non-monsoon period the downstream flow would be of the order of 0.06 MAFT from regeneration. However in order to maintain appropriate quality of the flow certain releases as minimum compensatory flow would be required to be released from SSP.

Water requirement and compensatory releases from SSP

The existing and planned fresh water requirements are estimated as under :

Location	Design Abstraction Rate (cumecs)	Water use
Angareshwar	0.25	Bharuch municipality (120,000 people)
Angareshwar (same intake)	0.90	Gujarat Narmada Fertilizer Co.
Jhanor	0.37	Narmada Bara Rural Water Supply Scheme (300,000 people)
Jhanor	0.35	Oil & Natural Gas Corpn. (includes water for 30,000 people)
Jhanor	0.46	National Thermal Power Corporation (for colling towers & other uses)
Jhanor	0.11	Gujarat Industrial Dev. Corporation (small industries at Bharuch)
Total	2.44	

During the period April and May the present 90% downstream flow is 0.05 MAF or  $24.3 \text{ m}^3 / \text{sec}$  and the current projected fresh water requirement for domestic and industrial use is  $2.4 \text{ m}^3 / \text{sec}$  as shown in the table above. Therefore allowing for an additional amount to cover the delution for poorer quality of water, it is considered reasonable to maintain a downstream flow of  $28.3 \text{ m}^3 / \text{sec}$  i.e. 1,000 cusecs. Generally this flow can be maintained even during construction through the lower level river sluices provided in the body of the dam at level 53 M. However this year, as the restoration work for the stilling basin area downstream of the dam is going on, it is not possible to release water from the sluices. It is therefore planned that water will be released from the dykes so that



a steady flow of  $28 \text{ m}^3 / \text{sec}$  would be maintained. Even at present this discharge is being maintained as minimum. In case the flow in the river gets reduced, as a back up arrangement additional discharge can be released from the Karjan dam so as to cater to the downstream requirement of water. The confluence point of Karjan and Narmada river is about 30 KM downstream from the dam. Thus arrangements are made for providing adequate supply of water for downstream users and also to contain the salinity ingress upto observed limits. Thus adequate quantum of water will be maintained in the downstream.

Releases during period of filling the reservoir :

Period of progressive filling will be kept minimum and during such period water will be continued to be released downstream of the dam as stated above.

Further while raising the blocks water level would be required to be lowered towards present level and while refilling there would be time lag of about 10 to 15 days depending upon the hydrology and timing of flow. During this period also it is planned to continue releasing the minimum flow downstream of the dam as stated above.

Flood warning to downstream area :

Necessary warning will be issued to the inhabitants in advance by the district administration so that people may not be caught unaware due to sudden release of water in the river. Necessary signboards will also be displayed at appropriate place and all necessary arrangements should be made to warn the people.

Control measures for mosquito breeding :

Control measures would also be taken to contain mosquito breeding in small ditches that might be formed downstream of the reservoir during the period of filling.

The situation analysis and action taken report in this respect is as under :

- In the downstream of reservoir, the swollen river will shrink during the above short period of filling of the reservoir, resulting into creation of water pools in the riverbed providing opportunity for mosquito breeding, but this period may be too short for building up of effective mosquito density and thus spread of malaria. This period being a period of active monsoon, soon after the filling of reservoir the river will again swell and start flowing on two banks and water pools mosquito breeding places will be washed out before they can play role in building up of effective mosquito density.
- This entire period is period of active monsoon and the period of active transmission of malaria in Gujarat and hence as per the routine plan entire public health machinery remains at high alert for prediction, early detection and prevention and control of malaria which includes control of mosquito breeding places near all habitat sites including habitats on river banks. At the urban habitats like Bharuch, Ankleshwar on the riverbanks, anti larval activities including introduction of larvivores fish in the big water puddles in the riverbed are also carried out by urban malaria workers.
- Again, this is a normal situation encountered in the post monsoon season in all habitats on the banks of rivers, as most of the rivers swells during monsoon and shrinks in the post monsoon period leaving large number of

water puddles in river bed providing excellent opportunity for mosquito breeding for some time and hence the Public Health machinery in such areas remains alerted for early detection and control of malaria. Following steps are routine for the above situation.

- Community Awareness campaign for Anti malaria activity, by observing June as Anti Malaria Month and organizing village level workshops / shibirts.
- Intensify surveillance for fever/malaria case detection and treatment.
- Indoor insecticides Residual Spray in all areas where Annual Parasitic Index (API) is above two.

Following mitigatory measures are planned:

1. Decide on the anti mosquito interventions such as larviciding, and use of larvivores fish in urban areas close to the river bank and focal indoor residual spraying with suitable insecticide in problematic villages.
2. Intensify fever surveillance for a period of six weeks to detect and treat all malaria cases.
3. Review of preparedness of health services in concerned PHCs / UMS and provide necessary support if required.

The following steps are planned to be taken by various agencies of the State:

The District Malaria Officers (DMOs) of the concerned districts (Narmada, Bharuch and Vadodara) will organise focal indoor residual insecticide spraying and intensive surveillance for detection and treatment of malaria cases.

Urban Malarias Scheme of both Bharuch and Ankleshwar towns would be supervised by the DMO Bharuch and the anti larval / anti adult measures will be implemented and intensive surveillance will be carried out in urban areas towards the riverside.

The Medical Cell of SSPA Vadodara would also participate in indoor residual spraying and intensive surveillance for fever / malaria cases and their treatment in all R&R sites including the R&R sites along the bank.

8-3-(a)

केवल सरकारी प्रयोग के लिए  
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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**चालीसवीं बैठक का कार्यवृत्त**  
**Minutes of the 40<sup>th</sup> Meeting**

28 जून, 2004 को  
पर्यावरण भवन, नई दिल्ली में हुई  
Held at Paryavaran Bhawan, New Delhi on 28<sup>th</sup> June, 2004

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**Indore**



# नर्मदा नियंत्रण प्राधिकरण NARMADA CONTROL AUTHORITY

सं: पर्या-3(40)2004/ 2779-2818

दिनांक: 5 अगस्त 2004

सेवा में,

न.नि.प्रा. के पर्यावरण उपदल के सभी सदस्य/आमंत्रितगण,  
संलग्न सूची के अनुसार ।

विषय: नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की चालीसवीं बैठक का कार्यवृत्त ।

महोदय,

इस पत्र के साथ नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की पर्यावरण भवन, नई दिल्ली में दिनांक 28 जून, 2004 को हुई चालीसवीं बैठक के कार्यवृत्त की एक प्रति संलग्न कर भेजी जा रही है ।

यदि इस पर आपकी कोई टिप्पणी/सुझाव हो तो यथाशीघ्र इस कार्यालय को भेजने का कष्ट करें

कृपया इसकी प्राप्ति की सूचना दें ।

संलग्नक : कार्यवृत्त ।

भवदीय,

( डा. पवन कुमार )  
निदेशक (पर्यावरण)

प्रतिलिपि सूचनार्थ प्रेषित :

1. सचिव, जल संसाधन मंत्रालय एवं अध्यक्ष, न.नि.प्रा., भारत सरकार, श्रम शक्ति भवन, रफी मार्ग, नई दिल्ली - 110 001.
2. मुख्य सचिव, महाराष्ट्र शासन, मंत्रालय, मुम्बई ।
3. मुख्य सचिव, राजस्थान शासन, सचिवालय, जयपुर ।
4. अध्यक्ष, सरदार सरोवर नर्मदा निगम लि0, ब्लॉक सं0 12, नया सचिवालय परिसर, गाँधीनगर ।

( डा. पवन कुमार )  
निदेशक (पर्यावरण)

116-बी.जी., स्कीम नं. 74-सी, विजय नगर, इन्दौर - 452 010 (म.प्र.)

116-BG, Scheme No. 74-C, Vijay Nagar, Indore - 452 010

Phone No. : Mem. (E&R) - 2554333, Dir(Env)-2571587, Dir(Reh)-2558603, PRO-2557691

Gram : NARCONTROL

Fax : 91-731-2554333

जल संरक्षण - जीवन संरक्षण  
Conserve Water - Save Life



# नर्मदा नियंत्रण प्राधिकरण NARMADA CONTROL AUTHORITY

No.Env-3(40)/2004/

5<sup>th</sup> August, 2004

To

All the Members & Invitees  
of the Environment Sub-group  
Narmada Control Authority  
(As per list attached)

**Sub: Minutes of the 40<sup>th</sup> Minutes of the Environment Sub-group.**

Sir,

Please find enclosed herewith a copy of the minutes of the 40<sup>th</sup> meeting of the Environment Sub-group held at Paryavaran Bhawan, New Delhi on 28.06.2004.

Your comments / observations on these minutes, if any, may kindly be sent to this office, at the earliest.

Kindly acknowledge receipt of the same.

Yours faithfully,

Encl: Minutes.

(Dr. Pawan Kumar)  
Director (Environment)

Copy for kind information to :

- 1) The Secretary (WR) & Chairman (NCA), Shram Shakti Bhawan, Rafi Marg, New Delhi – 110 001.
- 2) The Chief Secretary, Govt. of Maharashtra, Mantralaya, Mumbai.
- 3) The Chief Secretary, Govt. of Rajasthan, Secretariat, Jaipur.
- 4) The Chairman, Sardar Sarovar Narmada Nigam Ltd., Block No.12, New Sachivalaya Complex, Gandhinagar.

(Dr. Pawan Kumar)  
Director (Environment)

116-बी.जी., स्कीम नं. 74-सी, विजय नगर, इन्दौर - 452 010 (म.प्र.)

116-BG, Scheme No. 74-C, Vijay Nagar, Indore - 452 010

Phone No. : Mem. (E&amp;R) - 2554333, Dir(Env)-2571587, Dir(Reh)-2558603, PRO-2557691

Gram : NARCONTROL  
Fax : 91-731-2554333

जल संरक्षण - जीवन संरक्षण  
Conserve Water - Save Life

### आमंत्रितगण

1.	प्रधान सचिव, वन, राजस्व एवं वन विभाग, महाराष्ट्र सरकार, मंत्रालय, मुम्बई - 400 032
2.	श्री ए.के.दुबे सदस्य, पर्या. एवं वन, नर्मदा घाटी विकास प्राधिकरण, नर्मदा भवन, तुलसी नगर, भोपाल - 462 003
3.	श्री आर.के. असारी, मुख्य वन संरक्षक, सरदार सरोवर नर्मदा निगम लि., नया सचिवालय परिसर, गोंधीनगर-10
4.	अति. सचिव पर्यावरण, राजस्थान सरकार, पर्यावरण विभाग, कमरा न. 321-ए, एस.एस.आ. 0 भवन, सचिवालय, जयपुर -302 005
5.	महानिदेशक, स्वास्थ्य सेवाये, 4थी मंजिल, सरकारी दंत चिकित्सा भवन, सेन्ट जार्ज हास्पिटल कम्पाउन्ड, मुम्बई - 400 001
6.	संयुक्त सचिव, भारत सरकार, पर्यावरण एवं वन मंत्रालय, सी.जी.ओ.काम्पलेक्स, लोदी रोड, नई दिल्ली-110 003
7.	संयुक्त सचिव, (मृदा संरक्षण) भारत सरकार, कृषि मंत्रालय, कृषि भवन, डा. राजेन्द्र प्रसाद मार्ग, नई दिल्ली-110 001
8.	सचिव, कैड, महाराष्ट्र शासन, सिंचाई विभाग, मन्त्रालय, मुम्बई - 400032
9.	आयुक्त, संचालनालय, पुरातत्व, अभिलेखागार एवं संग्रहालय विभाग, मध्य प्रदेश शासन, बाणगंगा, टी.टी. नगर, भोपाल ।
10.	श्री इन्द्र राज, सचिव, सरदार सरोवर निर्माण सलाहकार समिति, ए-ब्लाक, चौथी मंजिल, नर्मदा भवन, इन्दिरा एवेन्यू, बडोदरा - 390 001
11.	मुख्य वन संरक्षक (केन्द्रीय) भारत सरकार, पर्यावरण एवं वन मंत्रालय, पश्चिमी क्षेत्रीय कार्यालय, लिंक रोड नं.3, ई-5, अरैरा कालोनी, भोपाल - 462016.
12.	डा. शमशेर सिंह, अति. निदेशक, भारत सरकार, कृषि एवं सहकारिता विभाग, शास्त्री भवन, नई दिल्ली - 110 001
13.	संयुक्त निदेशक, पर्यावरण एवं वन मंत्रालय, भारतीय वनस्पति सर्वेक्षण, केन्द्रीय वृत्त, 10 चैथम लेन, इलाहाबाद - 211002
14.	डा. आर.सी. शर्मा, उप-निदेशक, राष्ट्रीय संक्रामक रोग संस्थान, 22, श्याम नाथ मार्ग, नई दिल्ली - 110 007
15.	मुख्य अभियन्ता -इएपी- एवं संयुक्त सचिव, सिंचाई, महाराष्ट्र सरकार, सिंचाई विभाग, मंत्रालय मुम्बई - 400 032
16.	प्रबन्ध निदेशक, नेशनल हाइड्रो पावर डेवलपमेन्ट कॉर्पोरेशन लि., द्वितीय खण्ड, 5वीं मंजिल, पर्यावास भवन, जेल रोड, अरेरा हिल्स, भोपाल ।
17.	श्री बी.जी. वर्गीज, अनुसंधान प्रोफेसर, सेन्टर फार पालिसी रिसर्च, धर्मा मार्ग, चाणक्यपुरी, नई दिल्ली - 110021
18.	श्री वी.जी. टकालकर, वन संरक्षक, धुले सर्कल, महाराष्ट्र शासन, धुले ।
19.	श्री एल. प्रसाद, संयुक्त सचिव, भारतीय सिस्टम आफ मेडिसिन एवं होमियोपैथी विभाग, आई.आर. सी.एस. बिल्डिंग, 1, रेडकास रोड, नई दिल्ली - 110001



### **INVITEES**

1. Principal Secretary (Forests), Revenue & Forest Department, Govt. of Maharashtra, Mantralaya, Mumbai- 400 032.
2. Shri A.K. Dubey, Member (E&F), Narmada Valley Development Authority, Narmada Bhawan, Tulsi Nagar, Bhopal - 462 003.
3. Shri R.K. Asari, Chief Conservator of Forests, Sardar Sarovar Narmada Nigam Ltd., Block No.12, New Sachivalaya Complex, Gandhinagar - 382 010
4. The Addl. Secretary (Env.), Govt. of Rajasthan, Environment Department, Room No.321-A, SSO Bhawan, Sachivalaya, Jaipur - 302 005.
5. The Director General, Health Services, 4<sup>th</sup> Floor, Govt. Dental College Building, St. George Hospital Compound, Mumbai - 400001.
6. The Joint Secretary, Ministry of Environment & Forests, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi - 110 003.
7. The Joint Secretary, (Soil Conservation), Govt. of India, Ministry of Agriculture, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi - 110 001.
8. Secretary (CAD), Govt. of Maharashtra, Irrigation Department, Mantralaya, Mumbai- 400 032.
9. The Commissioner, State Department of Archaeology & Museum, Govt. of M.P., Banganga, T.T. Nagar, Bhopal.
10. Shri Indra Raj, Secretary, Sardar Sarovar Construction Advisory Committee, A-Block, 4th Floor, Narmada Bhawan, Indira Avenue, Vadodara-390001.
11. Chief Conservator of Forests (Central), Ministry of Environment & Forest, Western Regional Office, Link Road No.3, E-5, Arera Colony, Bhopal - 462016.
12. Dr. Shamsheer Singh, Additional Director, Govt. of India, Department of Agriculture & Cooperation, Shastri Bhawan, New Delhi - 110 001.
13. Addl. Director, Botanical Survey of India, Central Office, 10 Chatham Line, Allahabad - 211 002 (U.P.)
14. Dr. R.C. Sharma, Joint Director, National Institute of Communicable Diseases, 22, Shyam Nath Marg, New Delhi-110 007.
15. The Chief Engineer (EAP) & Joint Secretary (Irrigation), Govt. of Maharashtra, Irrigation Department, Mantralaya, Mumbai- 400 032.
16. Managing Director, National Hydropower Development Corporation Ltd., 2<sup>nd</sup> Block, 5<sup>th</sup> Floor, Paryavas Bhawan, Jail Road, Arera Hills, Near Vallabh Bhawan, Bhopal, M.P.
17. Shri B.G. Varghese, Research Professor, Centre for Policy Research, Dharma Marg, Chanakyapuri, New Delhi - 110 021.
18. Shri V.G. Takalkar, Conservator of Forests, Dhule Circle, Dhule, Maharashtra.
19. Shri L. Prasad, Joint Secretary, Department of Indian System of Medicine & Homoeopathy, IRCS Building, 1, Red Cross Road, New Delhi - 110 001.

### पर्यावरण उपदल के सदस्यगण

- १- डा. प्रदीप्तो घोष, सचिव, भारत सरकार, पर्यावरण एवं वन मंत्रालय, सी.जी.ओ. काम्पलेक्स, लोदी रोड, नई दिल्ली-110 003 - अध्यक्ष
- 2- श्री ए.सी. गुप्ता, कार्यकारी सदस्य, न.नि.प्रा., बी.जी.113, योजना क्रमांक-74-सी, विजय नगर, इन्दौर - 452 010 म.प्र.
- 3- श्री प्रदीप भार्गव, उपाध्यक्ष, नर्मदा घाटी विकास प्राधिकरण, नर्मदा भवन, तुलसी नगर, भोपाल-462003.
- 4- श्री एस.के. महापात्र, प्रबन्ध निदेशक, सरदार सरोवर नर्मदा निगम लि., नया सचिवालय परिसर, गौधीनगर - 382 010
- 5- श्री बी.पी. पाण्डेय, सचिव पर्यावरण, महाराष्ट्र सरकार, पर्यावरण विभाग, चौथी मंजिल, मंत्रालय, मुम्बई-38
- 6- सचिव, पर्यावरण, राजस्थान सरकार, पर्यावरण विभाग, सचिवालय, जयपुर - 302005
- 7- श्री ए.डी. भारद्वाज, आयुक्त, पी.आर, भारत सरकार, जल संसाधन मंत्रालय, श्रम शक्ति भवन, रफी मार्ग, नई दिल्ली - 110 001.
- 8- महानिदेशक, नृवंशविज्ञान सर्वेक्षण विभाग, पश्चिम ब्लाक-2. प्रथम मंजिल, स्कंध-6, रामकृष्ण पुरम, नई दिल्ली - 110066
- 9- महानिदेशक, भारतीय आयुर्विज्ञान अनुसंधान परिषद, अंसारी नगर, पोस्ट बाक्स नं. 4508, नई दिल्ली - 110 029
- 10- महानिदेशक, भारतीय पुरातत्व सर्वेक्षण, 11, जनपथ, नई दिल्ली - 110001
- 11- उपमहानिदेशक, मृदा कृषि विज्ञान एवं इंजीनियरी, भारतीय कृषि अनुसंधान परिषद, कृषि भवन, डा. राजेन्द्र प्रसाद मार्ग, नई दिल्ली - 110001
- 12- निदेशक, भारतीय वन्य जीव संस्थान, पोस्ट बाक्स नं. 18, देहरादून - 248 001
- 13- डा. आर.के. कट्टी, एक्स-1, आर.एच-4, सेक्टर-9, सी.बी.डी., कोंकण भवन, बेलापुर, नवी मुम्बई - 400 614
- 14- डा. एस. रामाशेषन, वाई-24/4, फिफ्थ एवेन्यू, अन्ना नगर, चेन्नई ।
- 15- डा. शेखर सिंह, निदेशक, साम्या - सेन्टर फार इक्वीटी स्टडीज, सी-17ए, डी.डी.ए. फ्लैट्स, मुनीरका, नई दिल्ली-110067
- 16- उप-महानिरीक्षक, वन, भारत सरकार, पर्यावरण एवं वन मंत्रालय, पर्यावरण भवन, सी.जी.ओ. काम्पलेक्स, लोदी रोड, नई दिल्ली-110 003
- 17- श्री सुरेश चन्द, सदस्य, पर्यावरण एवं पुनर्वास, न.नि.प्रा., बी.जी.-116. योजना क्र.-74-सी. विजय नगर, इन्दौर -452010 - सदस्य सचिव

### **MEMBERS OF ENVIRONMENT SUB-GROUP OF NCA**

1. Dr. Prodipto Ghosh, Secretary, Govt. of India, Ministry of Environment & Forests, Paryavaran Bhawan, C.G.O. Complex, Lodhi Road, New Delhi-110 003.  
- **Chairman**
2. Shri A.C. Gupta, Executive Member, NCA, BG-113, Scheme No.74-C, Vijay Nagar, Indore, 452 010.
3. Shri Pradip Bhargava, Vice-Chairman, Narmada Valley Development Authority, Narmada Bhawan, Tulsi Nagar, Bhopal - 462 003.
4. Shri S.K. Mohapatra, Managing Director, Sardar Sarovar Narmada Nigam Ltd. Block No.12, New Sachivalaya Complex, Gandhinagar-382 010
5. Shri B.P. Pandey, Secretary (Environment), Govt. of Maharashtra, Environment Department, New Administrative Building, Opposite Mantralaya, Mumbai-400032
6. The Secretary (Environment), Govt. of Rajasthan, Environment Department, Sachivalaya, Jaipur - 302 005.
7. Shri A.D. Bhardwaj, Commissioner (PR), Govt. of India, Ministry of Water Resources, Shram Shakti Bhawan, Rafi Marg, New Delhi-110001.
8. The Director-General, Anthropological Survey of India, West Block No.2, Wing No.6, 1st Floor, R.K. Puram, New Delhi - 110 066.
9. The Director-General, Indian Council of Medical Research, Ansari Nagar, Post Box No.4508, New Delhi-110029.
10. The Director-General, Archaeological Survey of India, 11, Janpath, New Delhi - 110001.
11. The Deputy Director-General, Soil Agronomy & Engineering, ICAR, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi - 110 001.
12. Director, Wildlife Institute of India, Post Box No.18, Dehradun - 248 001.
13. Dr. R.K. Katti, X-1. RH-4, Sector-9, C.B.D., Konkan Bhawan, Belapur, New Mumbai - 400 614.
14. Dr. S.Ramaseshan, Y-24/4, Fifth Avenue, Anna Nagar, Chennai.
15. Dr. Shekhar Singh, Director, Samya-Centre for Equity Studies, C-17A, DDA Flats, Munirka, New Delhi - 110 067.
16. The Deputy Inspector General, Forest (FC), Govt. of India, Ministry of Environment & Forest, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi- 110 003
17. Shri Suresh Chand, Member (E&R), NCA, BG-116, Scheme No.74-C, Vijay Nagar, Indore - 452 010  
- **Member Secretary**

**MINUTES OF THE 40<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF THE  
NCA HELD ON 28<sup>th</sup> JUNE, 2004 AT PARYAVARAN BHAWAN,  
CGO COMPLEX, NEW DELHI**

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## ANNEXURES

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<b>X<sub>L</sub>Min-(3)</b>	<b>Letter No. NVDD/E&amp;F/2004/1123 from NVDD, GoMP regarding inclusion of 2 additional agenda items on permission for fishing in Indira Sagar Project and constitution of Wildlife sanctuaries under Sardar Sarovar Project.</b>	<b>28-52</b>

**MINUTES OF THE 40<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF THE  
NCA HELD ON 28<sup>th</sup> JUNE, 2004 AT PARYAVARAN BHAWAN,  
CGO COMPLEX, NEW DELHI**

The 40<sup>th</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held at Paryavaran Bhawan, CGO Complex, New Delhi, under the Chairmanship of Dr. Prodipto Ghosh, Secretary, Ministry of Environment & Forests (MoEF), Govt. of India. The Chairman welcomed the Members and Invitees to the meeting. Discussions on the agenda items were taken up thereafter.

A list of participants is enclosed at **Annex-XL-Min-(1)**.

**Item No.XL-1(184) : CONFIRMATION OF THE MINUTES OF THE 39<sup>TH</sup> MEETING**

Minutes of 39<sup>th</sup> Meeting of Environment Sub-Group of Narmada Control Authority as circulated to all Members and Invitees vide NCA's Office letter No.Env-3(39) /2004 /362-402 dated 16<sup>th</sup> January 2004 were taken up for confirmation.

The Managing Director, SSNNL, stated that the entire command area was very large and that discussions during the meeting referred to only for the Phase-I areas and, therefore stressed for corrections in the minutes. He also assured the submission of the CAD plan for the Phase-II areas by November, 2004. After some discussions, Sub-group accepted the request of the Managing Director, SSNNL.

Accordingly, the fifth line *"entire command area should be submitted within the next three months time"* under Para No.3 on Page No.6 is to be read as follows:-

*" \_ \_ \_ Phase-I command area should be submitted within the next three months time".*

The minutes were confirmed with the above modifications suggested by the SSNNL.

**Item No.XL-2(185)      REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES.**

**A.      Construction Schedule: Sardar Sarovar Project:**

Progress presented in the Agenda Notes was noted by the Sub-group. Prof. S. Ramaseshan reiterated that medium flow which extended for more than two months during the monsoon period should be considered for planning and execution of the Environment Safeguard Measures and not just the level pool submergence.

The Managing Director, SSNNL, informed that back water flows were considered for detailed planning of measures like relief and rehabilitation works and details were available with the SSNNL. He further stated that the information presented in the Agenda was of only a general nature and assured that details as requested by Prof. S. Ramaseshan would be made available to him soon.

The Vice Chairman, NVDA, stated that back water flows were always considered by the Govt., of Madhya Pradesh while planning relocation / excavation works of monuments / mounds and other measures and that all activities were planned considering flow conditions of 1 in 100 year floods.

Prof. S. Ramaseshan suggested that as a large number of factors depended on submergence to be caused by the monsoon floods, it would be appropriate if back water curve commensurate with medium monsoon flow was considered while presenting the status of compliance for a review by the Members of the Sub-group.

The Chairman summed up the discussions by stating that the details as suggested by Prof. S. Ramaseshan should be provided to him by the concerned party States.

**B.      Current Status of Implementation of the Environmental safeguard  
measures for the Sardar Sarovar Project**



**(a) Catchment Area Treatment****Phase-I Programme (1,79,180 Ha.). (Quantitative)**

The information contained in the Agenda note was presented, for up-dating by the party States.

**Govt., of Madhya Pradesh**

It was informed by the Member (E&R) that in pursuance to the discussions of the 39<sup>th</sup> meeting, Govt., of Madhya Pradesh had submitted the action taken report (ATR) and have also reported that against a target of 1,25,725 ha. of catchment area (51,930 ha. forest area and 73,795 ha. of non-forest area) an area of 1,10,997 ha. (44,600 ha. forest and 66,397 ha. of non forest area) commensurate with full reservoir level (FRL) was already treated and that the remaining area was not treatable on account of being rocky, water logged etc., and that photographs of such areas, as suggested by the Sub-group, were made available. Copies of the photographs were placed on the table for perusal of the Members.

**Govt., of Maharashtra**

The Nodal Officers (CAT) and (CAF), GoM, stated that the treatment of the entire catchment of Phase-I was already completed and that the progress should be taken as completed.

**Phase-I Programme (Qualitative)****Assessment of plantation works**

Regarding suggestions of the ESG for taking up assessment of the treated areas through satellite imageries, it was desired by the Chairman during the last meeting that sub-watershed wise data of the treated areas should be obtained and presented in form of a report before the next meeting of the ESG for perusal of the Members. Status of the compliance reported during the meeting is presented below.

**Govt., of Gujarat**

The Managing Director, SSNNL, informed that project specific assessment of the plantation raised under CAT programme extending over 27,000 ha area,

through satellite imageries, was carried out earlier and is also being re-assessed periodically. The results were encouraging.

### **Govt., of Maharashtra**

Representative of the Govt., of Maharashtra informed that project specific sub-watershed wise assessment of the plantation works was carried out by the Nagpur Branch of FSI and results were presented to the Sub-group earlier. The periodic re-assessment was being carried out.

### **Govt., of Madhya Pradesh**

The Vice Chairman, NVDA, informed that considering that the catchment area treatment works have been completed and that data on District wise increase in forest cover is available from FSI, detailed assessment on efficacy of the CAT works in priority sub-watersheds might not be necessary.

### **Silt Monitoring Works**

Director (Env.), NCA, brought to the notice of the Sub-group that the issue was discussed earlier in detail by the Sub-group and it was directed that ~~party States~~ silt monitoring stations in Gujarat, Maharashtra and Madhya Pradesh be installed

- GoG had entrusted this work to the Central Soil Research and Training Institute (CSR&TI), Silaqui, Dehradun who have presented the interim report. However, the final report is still awaited.
- GoMP was also requested by the Sub-group to establish sample stations with the help of the CSR&TI and GoMP was taking action accordingly.
- No steps were taken so far by the Government of Maharashtra.

For the areas in Madhya Pradesh, the Vice Chairman, NVDA informed that the silt load data of the 14 gauging stations along the Narmada river was already available with the CWC, who have been requested to analyze the same for the benefit of the party states. A copy of the Bar Chart showing declining trend in silt outflows was presented. In response to a question from the Chairman, it was informed that silt load data collected and analysed by the CWC was only indicative of the general trend of soil erosion and was not specific to the project.

GoG officials informed that 6 silt monitoring stations have been installed and their observations are being recorded regularly. Observers have been trained by CRS&TI for the purpose.

Prof. B.G. Verghese expressed the opinion that if general trends on reduction of silt were available for the Narmada River as a whole, sub-watershed wise assessment of the works might not be needed.

Prof. S. Ramaseshan, explained that mechanism of monitoring was essentially required to assess the success or failure of the CAT measures at the cost of huge investments. The monitoring mechanism should be put in place to ensure that the structures are maintained and remain functional. This should be a continuous process.

The Chairman summed up the discussions stating that dedicated focused monitoring for assessment of the CAT works is a continuous process and arrangements made for the same should be continued.

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

Member (E&R) informed that during the last meeting, copies of notification of the areas afforested and notified as protected forest was requested. Progress received from GoMP and GoG indicated substantial progress .

**Govt., of Gujarat**

The CCF, SSNNL, informed that the process of notification of non forest areas as protected forest was making progress and substantial areas have already been notified. Territorial Divisions have already taken up possession of the plantations raised on non forest land. Copies of the notification for some areas were made available to the NCA vide letter dated 23.6.2004.

**Govt., of Madhya Pradesh**

The Vice Chairman, NVDA informed that the entire areas were transferred to territorial forest divisions. A total of 1623.782 ha. plantations on non-forest land have already been notified as protected forest and village wise details of the areas notified were made available to the NCA vide letter dated 21.6.2004.

### **Govt., of Maharashtra**

Representative of GoM informed that the afforestation in lieu of 4,200 ha. of forest area diverted for R&R work were completed in all respect and that short falls of 90 ha. against the forest area diverted for submergence is due to non suitability of the identified area for plantation. Copies of notification declaring non forest land as protected forest are yet to be submitted by the GoM.

### **COMPENSATORY AFFORESTATION : (Qualitative)**

During the last meeting, the Chairman stated that success rate of plantation would be better appreciated if indicated along with composition of species, the year of counting and the age of plantations. Member (E&R), NCA, presented the agenda item. It was observed by the Chairman that for the areas in Maharashtra the details on the survival percentage and the area covered is not adequate and requested more details as suggested earlier. For the areas in Madhya Pradesh, it was observed that the rate of survival percentage in almost 45% plantation area was almost less than 30%. The Vice Chairman, NVDA, however, explained that the survival percentage, rate of plantations in the areas taken up by the project authorities was better than the success rate normally achieved.

After some discussions, it was suggested by the Chairman that norms / yardstick of the GoMP regarding success or failure of the plantations should be made available to the Members before the next meeting.

### **(c) COMMAND AREA DEVELOPMENT**

### **Govt., of Gujarat**

Member (E&R), NCA informed the Sub-group that electronic copies of the Phase-I CAD plan for an area of 4.5 lacs ha. were available in the CD ROM for those who need it. The Managing Director, SSNNL, stated that plan for the Phase-II areas would also be submitted by November, 2004. Prof. R.K. Katti suggested that the dam construction is linked to impacts up-stream and that construction of the dam might not be tagged with CAD plans.

Director (Env.) NCA, brought to the notice of the Sub-group the stipulations contained in orders of clearances issued by the Govt. of India to the project and past decisions of the Environment Sub-group which required that progress on CAD works should commensurate with progress of works on development of the water delivery and conveyance system. This system was ready to receive water for irrigation purposes. Dam has nearly attained a height of RL 110.64m and along with IBPT was in a position to provide irrigation water. Negative impacts on health / water logging / salinity, etc., would manifest no sooner water was made available for irrigation. It was already reported during 39<sup>th</sup> meeting that some areas in Phase-I of the command were irrigated last year. It was further pointed out that Sub-group has earlier decided that command area planning would be assessed regarding pari-passu compliance with the development of canal system in the command.

Prof. S. Ramaseshan pointed out that studies on down stream requirements have been missing from the command area plan and were required to be conducted and translated into plan for implementation in time.

The Vice Chairman, NVDA, stressed that the project was a joint property of the party States wherein Madhya Pradesh has major stakes in generation of power which is feasible only when dam attained a height of RL 110.64m. He, therefore, suggested that the plan for development of command area might not be linked with filling up of the dam and generation of power, as otherwise it would be detrimental to the interest of GOMP

In response to a question from the Chairman regarding non-availability of the CAD plan vis-à-vis readiness of the project to supply irrigation water, the Managing Director, SSNNL, stated that earlier, water drawn through Irrigation By-pass Tunnel was mainly for the supply of drinking water. However this was also poured into other river systems like Mahi. As these river systems have a well developed area of the command, negative manifestation were un-likely.

The Chairman summed up the discussions by saying that water might be drawn from the SSP for generation of power if so envisaged but after generation of power it should not be utilised for irrigation in SSP command, until approved plan to mitigate negative impacts was implemented and till then this water must be

released into the Narmada river system.

**Govt., of Rajasthan**

Member (E&R) pointed out that CAD plan for Rajasthan areas was circulated to the Members of the ESG for their perusal, observations and discussions during the meeting. Comments received were forwarded to the GoR for attending to the queries raised. Representative of GoR stated that comments received were being attended to. Discussions on this item were, therefore, differed for the next meeting.

**(d) FLORA, FAUNA AND CARRYING CAPACITY**

**Felling of trees from submergence area**

**Govt., of Gujarat and Madhya Pradesh**

Member (E&R), NCA, pointed out that the issue of felling of the tree growth from the areas to be inundated by the SSP waters was discussed in detail during the last meeting. Sub-group recommended raising of the dam height subject to several conditions. One of the key condition was that tree growth from the submergence area would be removed commensurate with progressive filling of the reservoir. It was pointed out by him that compliances were reported by GoMP and GoG but GoM lagged behind. He elaborated the efforts made by the NCA to impress upon the GoM for urgent actions but results remained elusive.

Director (Env.), NCA, brought to the notice of the Sub-group that no progress was made by GoM for prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc. This has resulted in a situation whereby large chunk of forest faces certain threat of inundation due to raise in the dam height and consequential rise in water level and its negative impact. It was pointed out that similar situation occurred earlier also whereby dam was raised but tree growth was not removed.

**Govt., of Maharashtra**

Representative of the GoM stated that as per orders received vide letter dated 28.4.2004 from the GoM, tenders were invited twice on 28.5.2004 and 5.6.2004 but responses from the contractors were lacking. Now that monsoon has

already set in, the felling from the Maharashtra side would only be possible after the monsoon was over. He, therefore, requested GoG to lend them a helping hand by undertaking felling from Gujarat side.

GoG officials expressed difficulty in taking up responsibility for felling of trees in Maharashtra due to difficult accessibility and shortage of time. Yet GoG agreed to explore the possibility in consultation with Forest officials of GoG and GoM for the needful.

Sub-group expressed deep concern and dissatisfaction on the failure of GoM to live up to its commitments for carrying out felling from the impacted zone within the stipulated time. Sub-group considered various options and after exhaustive discussions requested GoG to offer such help to GoM as needed for removal of trees and it was suggested that the cost of removing the trees must also be recovered from GoM.

**Status of implementation on recommendation of studies: Terrestrial Fauna:**

Director (Env.), NCA, pointed out that as per the EIA study reports prepared by the agencies engaged by the State Govt., the execution of felling of trees in the forest area to avoid the possibility of animals being trapped in the submergence area were required to be taken up in a systematic manner and the carrying capacity in the vicinity was required to be enhanced for accommodating extra wildlife moving out from the submergence area. This included provisions for migratory corridors for safe movement of wildlife from the submergence area to the up-land area of the vicinity and rehabilitation of endangered species of animals and plants. While substantial progress was reported by GoG through development of Shoolpaneshwar Wildlife Sanctuary, which was nearly completed, there was very little/ no progress in Maharashtra and Madhya Pradesh.

**Govt., of Maharashtra**

Representative of the GoM reported that GoM have prepared a plan for buffer zone plantation but funds for the same were awaited. Member (E&R), NCA, drew the attention of the Subgroup to the weak interdepartmental coordination in Maharashtra and pointed out that the Secretary (CAD), GoM who is allotting funds for different activities has been requested to make provision in the budget for

implementation of the environment safeguard measures like health, fisheries, flora & fauna, felling of trees, etc., but responses have not been adequate. He further informed that request routed by Environment Department, GoM, through the Secretary (CAD) for allotment of funds though promised in various fora, has not been viewed favorably and this is the main cause of delay in execution of environment safeguard measure works in Maharashtra.

The Sub-group noted with concern the conditions arising due to non implementation of the environment safeguard measures commensurate with progressive filling of the reservoir and discussed the issue in detail and strongly recommended creation of a Environment Cell for dedicated working for the cause of the SSP. It was further recommended that adequate provisions in the budget for GoM debitale to SSP should be made towards implementation of the environment safeguard measures.

#### **Govt., of Madhya Pradesh**

Member (E&R), NCA, stated that the proposal for creation of Sanctuaries for the SSP was received from GoMP along with the proposal for permitting fishing activities in the proposed National Parks for the ISP with the request to ~~for~~ discuss the same as a separate item with the permission of the Chairman. The issues were discussed with the permission of the Chairman. The discussions related to ISP are covered under "Any Other Item" separately.

Member (E&R), NCA, drew the attention of the Sub-group to the recommendations of the EIA report carried out by the Forest Research Institute, Jabalpur, and stated that earlier the Wildlife Committee constituted by the GoMP had not agreed for creation of Bokarata and Mathawad wildlife sanctuaries. GoMP has now submitted a proposal with the approval of same Committee for creation the of 2 Sanctuaries namely Bokarata and Kathiawad at an estimated cost of Rs.35.73 crores and have requested the Sub-group to discuss the issues on merit.

The Vice Chairman, NVDA, elaborated it further by stating that the proposal before the Sub-group was for in-principle approval. The issues related to the boundaries, social and other aspects shall be taken up later.



The issue was taken up for discussion and was summed up by the chairman by saying that it would be premature to discuss the proposal without a proper EIA report besides, more time be given to the members to study the proposal.

**Status of implementation on recommendation of studies on Aquatic Fauna Fisheries**

Director (Env.), NCA brought to the notice of the Sub-group that environment was being transformed from existing Lotic ecosystem into a newer Lentic environment of which fish was an important indicator. Several studies were conducted through NCA and the party states through identified agencies and reports were available. These studies identified action plan for pre and post impoundment scenarios which were to be implemented by the States Govts. Accordingly the plans were submitted by the State Govt., in various stages of completeness. Later, on the recommendation of the ESG, NCA vide its decision of the 52<sup>nd</sup> meeting formed a High Level Expert Group under the Chairmanship of Jt. Secretary (Fisheries) consisting of technical experts in the field including Director (Fisheries) of the party States. The fisheries plan and the guidelines for conservation of fisheries were under the scrutiny of the group. Draft guidelines were available and are proposed for discussions during the 7<sup>th</sup> meeting scheduled to be convened shortly.

**Govt., of Gujarat**

It was reported that the formulated action plan was under implementation and that reservoir and dykes were stocked with 426 lacs fingerlings. The water quality data was collected and sent to the NCA office vide letter dated 23.6.2004.

**Govt., of Madhya Pradesh**

It was reported that out of the 6 species found in the river system, which have been identified as vulnerable, the breeding technology of 4 species was already known and for the remaining 2, ICAR has agreed to take up works on breeding technology. One unit headed by the Assistant Director (Fisheries) was functioning at Badwani District. In addition, a long term hydro-biological

monitoring of water quality entrusted to the Universities at Jabalpur, Bhopal and Ujjain was making progress.

**Govt., of Maharashtra**

It was brought to the notice of the subgroup that in pursuance to the recommendations of the study groups, GoM entrusted study of organic loading of the reservoir from the fringe areas to assess the pollution load and possible rate of eutrophication. Results of these studies are still awaited. Updating of the plan was also awaited. The issue was urgent specially in view of the fact that people vested with traditional rights and concessions habituated to fishing in the shallow river would find it difficult to fish in the deep reservoir which required all together a different technology craft, gears and nets. Representative from the GoM stated that concerned officers from deptt of fisheries in the SSP reservoir could not make it to the meeting. The Sub-group, therefore, could not review the progress on development of fisheries for the areas in Maharashtra.

The Chairman summed up the discussions by saying that the issue of fisheries was already being discussed by an Expert Group consisting of technical experts of the field and therefore, it would be desirable that this issue be discussed along with the recommendations of the Expert Group on the subject during the next meeting.

**(e) SEISMICITY AND RIM STABILITY**

Director (Civil), SSNNL, informed that Dam Safety Review Panel met and reviewed the data up to January, 2001, and observed that the dam was safe and no review of the dam design was needed. Data was again analysed by the Dam Safety Panel during October, 2001 when it was noticed that effect of Bhuj Earthquake was totally imperceptible.

It was further reported that Seismic activity at the dam site and around the periphery was being studied by a team of experts. The data was being analysed and annual seismological bulletins were being published. GoG had requested the Director General, Indian Seismological Research Institute (ISRI), for the evaluation of the Seismic data obtained by the SSNNL.

Regarding up-gradation of network, the technical specifications were being worked out in consultation with IMD. The up-gradation was likely to cost about Rs.5.50 crores. GoG had planned to invite tenders by August, 2004 for the same work. The work was likely to be completed by September, 2005.

The Chairman expressed the opinion that the studies carried out were for a particular value of the probability. In fact, the dam as designed to withstand a probable earthquake of a given intensity and, therefore, it would not be proper to attach an absolute values to the statements.

**(f) HEALTH ASPECTS**

**Govt., of Madhya Pradesh**

It was informed by the Vice Chairman, NVDA, that the status presented in the Agenda Paper was with reference to the observations of the Committee which visited the areas some time back and suggested re-assessment of the situation especially in view of the substantial progress made by the GoMP in this regard.

It was informed that out of 57 dispensary buildings which have been completed, 22 have been handed over to the Departments and would be made functional soon. It was further reported that normal health care activities were taken up by the State Health Department through PHC and CHC. He assured that there would not be any deficiency in the treatment of affected population up to a dam height of RL110.64m. Regular training programs have been organised for surveillance and monthly information on major communicable diseases was being sent to the NICD. This information also was being processed by the Health Cell of the NVDA at Bhopal. The data in NICD format was being collected. Quality of the water was also being monitored. Entomological monitoring was being taken up with the help of Malaria Research Center.

Member (E&R), NCA, brought to the notice of Sub-group the observations of the ICMR on the Health plans of GoMP. A copy of the same is enclosed at Annex-XL-Min-(2).

**Govt., of Gujarat**

It was reported by the GoG that steps have been taken by Gujarat Pollution

Control Board for disposal of bio-medical waste in accordance with the Bio Medical Rules, 1998. Govt., Hospitals have been asked to obtain authorization and for arranging disposal of their waste.

**Govt., of Maharashtra**

Dr. Salunke, Director General, Health Services, GoM, assured the Sub-group that all the needed steps would be taken for streamlining the implementation of the proposed action and also for carrying out surveillance studies for the Phase-II in time. He stated that earlier surveillance studies were proposed to be entrusted to SCION Medical College but now it would be taken up by the Health Department for completing it expeditiously.

He also stated that it was unfortunate that GoM was found wanting on many issues discussed during the meeting and assured that though these issues do not pertain to his Department yet he would appraise the senior officers on the short falls reported to the Sub-group for timely remedial action.

**(g) ARCHAEOLOGY**

The Vice Chairman, NVDA, brought to the notice of the Sub-group that no monument shall be impacted by raising the dam height to RL110.64m even by its back water. He, however, presented the detailed account of the progress related to shifting and relocation of the monuments and mounds commensurate with submergence at FRL of 138m.

**(h) DOWN STREAM ENVIRONMENT**

Member (E&R), NCA, drew the attention of the Sub-group to the discussion of the last meeting wherein it was directed by the Chairman that there should be a formal plan for maintaining down stream flows. This plan was required to include detailed analysis of the requirement of the down stream users and monitoring of down stream release were to be ensured. He informed that a formal plan for management of downstream was received from SSNNL. Prof. S. Ramaseshan requested a copy of the plan for his perusal and observations.

The Chairman summed up the discussions by saying that this plan must be got examined and put up before the Members of the Sub-group for their observations.

**C. Status of the implementation of the environment safeguard measures corresponding to 110.64m height of SSP.**

In view of the discussion above, sub group did not consider it necessary to discuss the same issues again. Prof. S. Ramaseshan desired that copies of the plans and reports which formed a part of discussions during the meetings of the Sub-Group should be made available to him in advance to that these could be studied and suggestions could be offered during the discussions. However, the Sub-group felt that the Agenda papers circulated to the Members were quite elaborate and sufficient for discussions. Specific request of any Member, may, however, be met to the extent possible.

The Managing Director, SSNNL, requested the Chairman for inclusion of an item for reviewing the progress on survey and implementation on the environment safeguard measures commensurate with raising of dam height to RL 121.92m during its next meeting. This was agreed to.

**Item No. XL-3(186): REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES INDIRA SAGAR PROJECT**

In response to the statement of the Vice Chairman, NVDA that in view of the deliberations of the 6<sup>th</sup> meeting of the Review Committee of NCA, ISP need not be discussed in this forum, it was clarified by the Executive Member, NCA, that observations of the Vice Chairman, NVDA, are at variance with the records of the discussions referred to by him and also pointed out that the issue has already been discussed several times in the past meeting of this sub-group and the decision was that the environmental monitoring of ISP shall be continued by the NCA.

Prof. S. Ramaseshan also reiterated that the Sub-group has been monitoring implementation of environment safeguard measures for the ISP from the very beginning as statutory requirements which should not be dispensed with at this stage.

The Chairman reiterated that the issue was discussed during the last meeting also wherein it was reiterated that environmental monitoring of ISP would continue by the Sub-group as earlier and that no new direction has been received during the period from the competent authorities, therefore, no change in the decision was called for.

**A. CONSTRUCTION SCHEDULE:**

Progress was noted by the Sub-group.

**B. Current Status of Implementation of the Environmental safeguard measures**

**(a) CATCHMENT AREA TREATMENT**

The Vice Chairman, NVDA, informed that treatment of Phase-I areas of the Catchment would be completed within the calendar year 2004. Regarding progress on Phase-II program, it was reported that the progress was behind schedule due to non-availability of funds for the same.

Member (E&R), NCA, pointed out that as per the action taken report of GoMP, 4,587 ha. plantation area raised as vegetative measures under CAT has

been accounted for against the achievement of compensatory afforestation target also. Thus, the same plantation area has been shown against the achievement of CAT target as well as compensatory afforestation target. The Director (Env.), NCA, referred to the decisions taken by the Environment Sub-group in the earlier meetings in this regard and requested the GoMP to exclude the plantation areas covered under the CAT from the achievement of compensatory afforestation. The Chairman also endorsed this criteria and requested GoMP to take necessary action in this regard.

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

Compensatory afforestation in the balance area of 2,356 ha. of degraded forest area & 405 ha of non-forest area is proposed to be completed by July, 2004.

**(c) COMMAND AREA DEVELOPMENT AND DOWNSTREAM CONSIDERATION**

The Vice Chairman, NVDA, informed that ToR for preparation of a comprehensive integrated plan for development of command area was already prepared with the help of the NCA officials. Accordingly, the work has been entrusted to –

**1. M.P. Council for Science and Technology, Bhopal**

An amount of Rs.4,80,000=00 has been paid for thematic mapping using remote sensing technology.

**2. Survey of India, Jabalpur Office**

An amount of Rs.9,09,500=00 has been paid for digitization of about 70 topo-sheets.

**3. National Informatics Center (NIC)**

An amount of Rs.13,00,000=00 has been paid to integrate the digitalized data from SOI and data from MAPCOST. The draft ToR for calling financial proposal for the preparation of the command area development plan of ISP is under examination and finalization by MEG. Suitable agency shall be assigned the job of preparation of Command Area Development plan. A study on impact of agro-chemical runoff from the field of surface ground water quality in the

command area was assigned to Jawaharlal Nehru Agriculture University, Jabalpur. An interim report has been received so far. The final report is still awaited.

**(d) FLORA, FAUNA AND CARRYING CAPACITY**

Vice Chairman, NVDA, informed that during the meeting of Committee on Conservation and Management of Wildlife due to submergence of ISP and SSP held on 11.8.1993, creation of one National Park and 2 Sanctuaries were approved and necessary administrative formation were constituted for Omkareshwar National Park and Suranmaya / Mandhata Sanctuaries. Approvals for Rs.32.53 crores towards habitat related works were approved. NVDA has recently submitted a proposal for preliminary notification of Omkareshwar and Suranmaya / Mandhata Wildlife Sanctuaries. IIFM has been entrusted with the task of preparing of a detailed report of the proposed protected areas.

**(e) SEISMICITY AND RIM STABILITY**

The Vice Chairman, NVDA informed that the data collected at the monitoring stations was being analysed at the identified Institutes.

**(f) HEALTH**

The Vice Chairman, NVDA informed that the action plan for ISP and Omkareshwar were revised. Member (E&R), NCA, stated that these plans were sent for the observation of the ICMR which were received only during the meeting. The observations are enclosed at **Annex-XL-Min-(3)** for perusal of the Members of the Sub-group and follow-up action by the GoMP.

**(g) ARCHAEOLOGY**

The Vice Chairman, NVDA requested the Chairman to resolve the issues related to the protection of North bastion of the intake well of Joga Fort which would be impacted due to scour action of the water at FRL. He informed that it was through the good officers of the Chairman, Environment Sub-group through this specially convened meeting that the issue of clearance from the ASI for taking up protection measures for the above structure was obtained. It was, however,



pointed out that the clearance given by the ASI was beset with so many conditions which required that the entire rocky structure on which, the monuments of Joga Fort stood, needs to be protected rather than protection of intake well.

The issue was discussed by the Sub-group and it emerged that in-take well was designed to withstand the flood regime and that the monument itself located on an island and it may not be practical to protect the entire island.

The Chairman summed up the discussions by stating that reports on Geology, Rock and Soil might be got studied by the experts of the Govt., agencies or of the NHDC regarding stability of the rocks for satisfaction of the ASI and the matter may be resolved through mutual discussions.

#### **ANTHROPOLOGY**

Vice Chairman, NVDA, informed that all mounds have been excavated.

**Item No. XL- 4 (187) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

As most of the items were already covered up during the discussions earlier the Sub-group noted the progress contained in the Agenda for information.

**Item No. XL- 5 (188) : ANY OTHER ITEM**

**DEVELOPMENT OF FISHERIES IN THE ISP**

A copy of the Agenda proposed by the GoMP was placed before the Sub-group with the permission of the Chairman. A copy of the papers circulated are enclosed and placed at **Annex-XL-Min-(3)**.

The Vice Chairman, NVDA, stated that GoMP would be taking up development of fisheries in the reservoir as per provisions of the NWDTA. The plan for development of fisheries with due consultations with Experts in ICAR was already posed for assistance to NABARAD. Besides, Planning Commission has also agreed to the proposal. He explained the difficulties involved in pushing the proposal further as the fringe areas of the ISP reservoir were covered up under the proposed Sanctuaries areas. He brought to the notice of the Sub-group that as per amendments 2002 in the Wildlife (Protection) Act, 1972, fish has been defined as Wildlife. The GoMP, therefore, required clarification whether fishing activity would be permissible in the reservoir areas, especially in the areas to be covered under proposed Sanctuaries. He sought the help of the Sub-group in this regard.

Director (Env.), NCA, brought to the notice of the Sub-group that similar situation is faced by the GoM where 6,488 ha. forest area shall be submerged and since status of the submerged land would remain unchanged, GoM expressed difficulty in pushing up its proposal for development of fisheries for the SSP areas.

Member (E&R), NCA, explained that Forest (Conservation) Act, 1980 placed restriction on non-forestry activity on forest land. However, permission has to be sought and obtained under this Act for any non-forestry activity on merit. He further clarified that all species of fish are not included in the Wildlife schedules appended the Wildlife (Protection) Act, 1972.

The issue was discussed in detail and the Chairman summed up the situation by stating that, as this subgroup of NCA possessed no authority on this issue and no commitments could be made unless the legal issues are examined by the concerned wings of the MOEF. He, therefore, suggested that user agency has to apply with complete details to the MoEF directly. It was pointed out by him that normally commercial activities are prohibited in any protected area and this aspect has to be considered while notifying any area as National Park / Sanctuary. On the request of the GoMP for taking up this issue through Environment Sub-group it was suggested by him that the Members must be given some time to study the papers and the issue might also be discussed by the Expert Group on Conservation and Development of Fisheries in the reservoir and again be brought before the Sub-group for discussions on environmental consideration.

# ANNEXURES

#### **DATE AND VENUE OF THE NEXT MEETING**

The Chairman suggested that next meeting of the ESG could be arranged at 12:00 AM on 22<sup>nd</sup> September, 2004, at Kevadia.

**Meeting ended with vote of thanks to the Chair.**

**ANNEX-XL-Min-I**

**LIST OF PARTICIPANTS OF THE 40<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 28<sup>th</sup> June, 2004 AT PARYAVARAN BHAWAN, NEW DELHI.**

**Ministry of Environment & Forests**

1. Dr. Prodipto Ghosh, Secretary, MOEF, New Delhi
2. Dr. Shiv Kumar, Director, MOEF, New Delhi

**Narmada Control Authority**

1. Shri A.C. Gupta, Executive Member, NCA, Indore
2. Shri Suresh Chand, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore

**Sardar Sarovar Construction Advisory Committee**

1. Shri Indra Raj, Secretary, SSCAC, Vadodara

**Botanical Survey of India**

1. Dr. K.P. Singh, Jt. Director, Allahabad

**Archaeological Survey of India**

1. Shri M.M. Kanade, S.E. New Delhi

**Ministry of Health**

1. Shri T.O. Haqqi, New Delhi

**Ministry of Agriculture**

1. Dr. Shamsheer Singh, Addl. Commissioner (WP), MOA, New Delhi

**EXPERT MEMBERS**

1. Prof R.K Katti Expert Member, New Delhi.
2. Prof S . Ramashesan Expert Member, New Delhi.
3. Shri B.G. Varghese, Expert Member,

**GOVERNMENT OF GUJARAT**

1. Shri S.K.Mohapatra, Managing Director, SSNNL, Gandhinagar.
2. Shri R.V.Asari, CCF, Govt. of Gujarat State, Gandhinagar
3. Shri O.Ravi, Director, CAD, SSNNL, Gandhinagar.
4. Shri Anil B. Mandavia, Director (Civil), SSNNL, Gandhinagar
5. Shri Ashwin Parmar, Spl.(Env.), SSNNL, Gandhinagar
6. Dr. M.K. Gajera, Jt. Director (Health), SSNNL, Gandhinagar
7. Shri D.B. Vyas, OSD, NPG, Gandhinagar.

#### **GOVERNMENT OF MADHYA PRADESH**

1. Shri Pradip Bhargava, Vice Chairman, NVDA, Bhopal
2. Dr. Sharad Gaur, DFO (Monitoring), NVDA, Bhopal.
3. Dr. P.W. Kavathakar, Health Advisor, NVDA, Bhopal.
4. Shri V.B. Bhatt, Dy. Manager (Env.) , NHDC, Bhopal

#### **GOVERNMENT OF MAHARASHTRA**

1. Dr. Subhash Salunke, Director General, Health Services
2. Shri A.K. Saxena, CCF and Nodal Officer, Maharashtra, Forest Department
3. Shri R.S. Naikwadi, SDO, Shahada, Nandurbar

#### **GOVERNMENT OF RAJASTHAN**

1. Shri R.K. Saran, S.E., Narmada Canal Project Circle, Sanchore, Dist. Jalore.
2. Shri Arvind Mathur, Narmada Canal Project, Rajasthan.

20. 04. MON 03:06 FAX

ANNEX - XL Min-(2)

वी.प.बी.एक्स./PABX : 26588980, 26588707, 2658933h, 26589745,  
26589873, 26589414  
फैक्स/FAX : 011-26588662, 011-26589791, 011-265889258

गार / GRAM : विज्ञानी / SCIENTIFIC  
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## भारतीय आयुर्विज्ञान अनुसंधान परिषद INDIAN COUNCIL OF MEDICAL RESEARCH

वी. रामलिंगस्वामी भवन, अन्सारी नगर, पोस्ट बॉक्स 4911, नई दिल्ली - 110 029  
V. RAMALINGASWAMI BHAWAN, ANSARI NAGAR, POST BOX 4911, NEW DELHI - 110029

FAX No. 24362746

No.64/1/92-2004/ECD-II

Dated: 28.6.04

To

Dr. Pawan Kumar,  
Director (Narmada Control Authority),  
116-BG, Scheme No.74-C,  
Vijay Nagar,  
Indore

Subject:- Health Action Plan submitted by Govt. of Madhya Pradesh and  
Maharashtra -

Sir,

This is in refernece to your letter no. Env.4(6)/2004/2222 dated 20<sup>th</sup> May,  
2004 regarding above mentioned subject matter.

Kindly find enclosed the Council's comments on the Action Plans i) Health  
Action plan of health cell for Narmada Valley Project (Sardar Sarovar Project), ii)  
Health Action plan for Indira Sagar & Omkareshwar project - Part A and iii)  
Health Action plan for Indira Sagar & Omkareshwar project (Command area  
development) - Part B for your kind perusal.

Further I wish to inform you that due to my other prior commitment it will  
not be possible for me to attend the 40<sup>th</sup> meeting of the Environment Sub- Group  
of NCA to be held in Paryavaran Bhawan, New Delhi. The inconvenience  
caused in this regard is regretted.

Yours faithfully,

*Rashmi Arora*  
(Dr. Rashmi Arora)  
Deputy Director General (SG)  
For Director General

2 Pages



### Comments of the ICMR on following Health Action Plans

- I) Health Action plan of health cell for Narmada Valley Project (Sardar Sarovar Project)
- II) Health Action plan for Indira Sagar & Omkareshwar project - Part A
- III) Health Action plan for Indira Sagar & Omkareshwar project (Command area development) - Part B

- i) The project would benefit the villagers affected by the above projects to prevent & control water borne & arthropod borne diseases like gastroenteritis, malaria etc.
- ii) The objectives are clearly defined.
- iii) The Action Plan is being prepared keeping in view all the possible consequences water logging, re-habilitation of outsees, construction of dam, sanitation, need for additional health infrastructure to cope with immigrated population etc.
- iv) The Action plan for IEC activities at village level requires detail method of communication activities viz. group meetings, slogans on walls, video films, newspapers, pamphlets etc. The details should be mentioned in the Action Plan.
- v) All proposals should indicate management of collection of seepage water from dams in the Engineering Action plan to avoid breeding of mosquitoes.
- vi) The research activities plant with ICMR's Malaria Research Center needs to be mentioned in the Action plan.
- vii) The private practitioners should be imparted training on drug policies for malaria and filariasis etc.
- viii) The surveillance activity highlight prevention and control of malaria in the Action plan. However there are no details given regarding surveillance activities for other vector borne diseases.
- ix) All proposals should incorporate introduction of larvivorous fishes for mosquito control besides insecticide spray.
- x) There should be a centralized data management preferably on weekly basis. The details should be indicated in the Action plan.

①

**Government of Madhya Pradesh  
Narmada Valley Development Department,  
Mantralaya, Bhopal**

No. /NVDD/E&amp;F/2004/ 1123

Bhopal, dated 25/6/04

To,

Secretary,  
Govt. of India,  
Ministry of Environment & Forests, and  
Chairman,  
Environment Sub-group of Narmada Control Authority,  
Paryavaran Bhawan, Block-B,  
C.G.O. Complex, Lodhi Road,  
New Delhi.

**Sub. : Request for inclusion of two ex-agenda items in the agenda of the meeting of Environment Sub-group to be held on 28<sup>th</sup> June, 2004.**

Kindly find enclosed herein following two ex-agenda items proposed to be included in the agenda of the meeting of Environment Sub-group to be held on 28<sup>th</sup> June, 2004 :-

Ex. Agenda Item No. 1 : Permission to continue fishing activities in the Indira Sagar Project Reservoir and other Reservoirs involving diversion of forest land duly sanctioned by MoEF under provisions of FCA, 1980 and in the water bodies located within the boundaries of proposed protected areas.

Ex. Agenda Item No. 2 : Permission to constitute two Wild Life Sanctuaries under Sardar Sarovar Project.

It is requested that these two ex- agenda items may kindly be included in the agenda and discussed in the meeting.

Encl. : As above.

(Pradip Bhurgava)  
Principal Secretary,  
Narmada Valley Development Department  
Mantralaya, Bhopal

Endt.No. /NVDD/E&amp;F/2004/ 1124

Bhopal, dated 25/6/04

✓ Copy to : Member (Environment & Rehabilitation), Narmada Control Authority and Member Secretary, Environment Sub-group of NCA, Indore for information and necessary action. A set of above mentioned Ex-agenda items is enclosed herein.

Encl. : As above.

Principal Secretary,  
Narmada Valley Development Department  
Mantralaya, Bhopal

②

**Ex. Agenda Item No. 1 : Permission to continue fishing activities in the Indira Sagar Project Reservoir and other Reservoirs involving diversion of forest land duly sanctioned by MoEF under provisions of FCA, 1980 and in the water bodies located within the boundaries of proposed protected areas.**

\*\*\*\*\*

Proposal for notification of one national park viz. Omkareshwar National Park and two wildlife sanctuaries viz. Surmánya and Mandhata Sanctuaries is under consideration of the State Forest Department. The above three protected areas (PAs) are meant to be receiving areas of the wildlife to be displaced as a result of their habitat (forest areas etc.) going under submergence of Indira Sagar Project and Omkareshwar Project.

Various River Valley Projects viz. ISP, OSP, Man, Jobat, as well as SSP (M.P. zone) have a very high fishery potential comprising of approx. 1.25 lakh ha. of water area with a fish potential value of Rs. 25 crores per annum. The aim of fisheries development in the reservoirs is to create a carp dominated fishery by resorting to breeding (natural as well as artificial propagation), rearing and stocking of fingerlings of major carps consisting mainly of Catla catla, Labeo rohita and Cirrihina mrigala in the reservoirs. Stocking is considered to be successful only when the stocked species form a breeding population. The change over from riverine to lacustrine ecology in consequence of damming the rivers often affect some of the riverine species which are unable to adopt the new environment. Although creation of the protected areas is not relevant to this issue, adequate measures to rehabilitate such species through artificial propagation is being taken. Thus no adverse effect on the fish fauna in the protected areas, (if fishing is permitted) is anticipated. Our experience shows that 80-90 percent of the captured fish from the developed reservoirs consist of the stocked fish (viz. major carps) and the rest endemic species prevalent in the rivers. A list of fish fauna of Narmada river is appended herewith. This resource is likely to be severely affected if there is any kind of restriction or regulation of the entry, exploitation and transport as a result of some of the water areas of the reservoirs of the above projects being included in the protected areas to be notified as above. In addition, it will also adversely affect the rehabilitation of approx. 4000 uprooted fisher families (including the tribals) whose main livelihood is fishing. It is thus necessary to review the situation before promulgating any notification and necessary changes in the notification protecting the rights of development of fishery, entry, exploitation and transport of fish in the protected area may be incorporated. The legal issues involved may briefly be described as follows :

Govt. of India MoEF while according sanction for Indira Sagar Project in the clearance order issued in the year 1987 and 1989 has vide condition no. XVI laid down that after diversion the "legal status of the forest land will remain unchanged". For Indira Sagar Project 41111.97 ha. of forest land has been diverted. Since the legal status will not change after creation of Indira Sagar Reservoir it is apprehended that the forest land submerged under the reservoir will remain reserved forest/ protected forest and other types of forests. Same is true about other reservoirs of the state involving diversion of forest land. The section 26 (i) of Indian Forest Act has

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prohibited fishing in contravention of any rules made in this behalf by the state government and hence provided punishment with imprisonment for a term which may extend to six months, or with fine which may extend to five hundred rupees, or with both, in addition to such compensation for damage done to the forest as the convicting court may direct to be paid.

2. The Wild Life (Protection) Act, 1972 and Wild Life Protection Amendment Act, 2002 have vide section 2 (1), have defined that "animal" includes mammals, birds, reptiles, amphibians, fish other chordates and invertebrates and also includes their young and eggs. Although the schedule I Part II-A has given a list of fish species which are mostly marine. None of the species reported to be found in Indira Sagar Project listed in Annexure-1 are included in Schedule I of the act, but since fish has been classified as animal in section 2 (1) of the Wild Life (Protection) Act, 2002, it is feared that this provision as well as relevant section of the Act will adversely affect fishing activity which inter alia involves entry into PA's, exploitation/ removal of fishes, in the reservoir.

3. The proposed notification of Omkareshwar National Park and two wild life sanctuaries is likely to affect the access to the reservoir, landing sites situated on the rim of the reservoir and fishing activity in the ponds and other water bodies situated within the boundaries of National Park and Wild Life sanctuaries.

Therefore, in the light of above mentioned provisions of Indian Forest Act, 1927 and Wild Life (Protection) Act, 1972 and amendment 2002 the fishing activity in the reservoir situated in the Narmada Basin of M.P. State likely to constructed in future, is likely to be adversely affected which will deprive local fishermen, tribals, other inhabitants of the area and over all interest of the State of Madhya Pradesh. It is requested that clear cut permission for fishing in the reservoir and within the natural water bodies existing within the boundaries of the proposed Omkareshwar National Park and two Wild Life Sanctuaries may be accorded enabling state of M.P. to issue notification of the three proposed protected areas.

Encl. : One

(Pradip Bhargava)  
Principal Secretary,  
Narmada Valley Development Department  
Mantralaya, Bhopal

④

**Ex. Agenda Item No. 2 : Permission to constitute two Wild Life Sanctuaries under Sardar Sarovar Project**

\*\*\*\*\*

The Wild Life Committee, as constituted by the Govt. of Madhya Pradesh in compliance with the condition (xii) stipulated in the approval for diversion of 13385.45 ha. of forest land for Sardar Sarovar Project accorded by Govt. of India, Ministry of Environment & Forests' memo no. 8-372/83-FC dated 8<sup>th</sup> Sept. 1987 read with even numbered memo dated 6<sup>th</sup> Jan., 1989, has, during its meeting held on 14<sup>th</sup> Nov. 2002 under the Chairmanship of Principal Chief Conservator of Forests (Wild Life), Madhya Pradesh, Bhopal, recommended the constitution of two wild life sanctuaries. A copy of the minutes of the above meeting is enclosed herewith as Annexure-1.

The detailed estimates of various improvement works proposed to be carry out in these two wild life sanctuaries have been submitted by Principal Chief Conservator of Forests (Wild Life), Madhya Pradesh, Bhopal, vide his U.O. Note dated 30.12.2002. A copy of this note is enclosed herewith as Annexure-2.

It is hereby requested that the members may deliberate on these issues and take a decision for constitution of the above mentioned two wild life sanctuaries as recommended by the Wild Life Committee.

Encl. : As above

(Pradip Bhargava)  
Principal Secretary,  
Narmada Valley Development Department  
Mantralaya, Bhopal

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ANNEXURE - 1

**A comparative statement of fish species encountered by different workers from the River Narmada.**

	1	2	3
1. <i>Hilsa ilisha</i> (Hamilton)	E	-	E
2. <i>Gonialosa manmina</i> (Hamilton)	E	-	E
3. <i>Notopterus notopterus</i> (Pallas)	E	E	E
4. <i>N. chitala</i> (Hamilton)	-	-	E
5. <i>Chela laubuca</i> (Hamilton)	E	-	E
6. <i>Oxygaster clupeoides</i> (Bloch)	E	-	E
7. <i>Barilius barila</i> (Hamilton)	E	E	E
8. <i>B. bendelisis</i> var <i>chedra</i> (Hamilton)	E	E	E
9. <i>B. evezardi</i> (Day)	E	-	E
10. <i>B. radiolatus</i> (Gunther)	E	-	E
11. <i>B. vagra</i> (Hamilton)	-	E	-
12. <i>Danio</i> (Danio) <i>aequipinnatus</i> (McClelland)	E	-	E
13. <i>D. (Danio) devario</i> (Hamilton)	E	-	E
14. <i>D. (Brachydanio) rerio</i> (Hamilton)	E	-	E
15. <i>Esomus danricus</i> (Hamilton)	E	-	E
16. <i>Rasbora daniconius</i> (Hamilton)	E	E	E
17. <i>Amblypharyngodon mola</i> (Hamilton)	E	-	E
*18. <i>Tor khudree</i> (Sykes)	E	-	E
19. <i>T. tor</i> (Hamilton)	E	E	E
20. <i>T. putitora</i> (Hamilton)	E	-	E
21. <i>Puntius ambassis</i> (Day)	E	-	E
22. <i>P. amphibia</i> (Cuvier & Valenciennes)	E	-	E
*23. <i>Puntius chrysopoma</i> (Cuvier)	E	-	E
24. <i>P. conchoniis</i> (Hamilton)	E	-	E
25. <i>P. dorsalis</i> (Jerdon)	E	-	E
*26. <i>P. guganio</i> (Hamilton)	E	-	E
*27. <i>P. pinnauratus</i> (Day)	E	-	E
28. <i>P. sarana</i> (Hamilton)	E	E	E
29. <i>P. sophore</i> (Hamilton)	E	E	E
30. <i>P. ticto ticto</i> (Hamilton)	E	E	E

ANNEXURE -

*31.	<i>P. titius</i> (Hamilton)	E	-	E
32.	<i>Oreochthys consuatis</i> (Hamilton)	E	-	E
33.	<i>Catla catla</i> (Hamilton)	E	E	E
34.	<i>Cirrhinus mrigala</i> (Hamilton)	E	E	E
35.	<i>C. reba</i> (Hamilton)	E	E	E
*36.	<i>Garra gotyla</i> (Gray)	E	-	E
37.	<i>G. lamta</i> (Hamilton)	E	-	E
*38.	<i>G. mullya</i> (Sykes)	E	E	E
39.	<i>Labeo bata</i> (Hamilton)	E	E	E
40.	<i>L. boggut</i> (Sykes)	E	-	E
41.	<i>L. calbasu</i> (Hamilton)	E	E	E
42.	<i>L. dyocheilus</i> (Bloch)	E	-	E
43.	<i>L. fimbriatus</i> (Bloch)	E	E	E
44.	<i>L. gonius</i> (Hamilton)	E	E	E
45.	<i>L. rohita</i> (Hamilton)	E	-	E
46.	<i>L. pangusia</i> (Hamilton)	-	E	-
47.	<i>Osteobrama cotio cotio</i> (Hamilton)	E	E	E
48.	<i>Crossocheilus latius latius</i> (Hamilton)	E	E	E
*49.	<i>Parapsilorhynchus tentaculatus</i> (Annandale)	E	-	E
50.	<i>Noemacheilus botia</i> (Hamilton)	E	E	E
51.	<i>N. beavani</i> (Gunther)	-	E	-
52.	<i>N. dayi</i> (Hora)	E	-	E
*53.	<i>N. evezardi</i> (Day)	E	-	E
54.	<i>Lepidocephalichthys guntea</i> (Hamilton)	E	-	E
55.	<i>Ompok bimaculatus</i> (Bloch)	E	E	E
56.	<i>Wallago attu</i> (Bloch & Schneider)	E	E	E
57.	<i>Mystus (Mystus) bleekeri</i> (Day)	E	E	E
58.	<i>M. (Mystus) cavasius</i> (Hamilton)	E	E	E
59.	<i>M. (Mystus) vittatus</i> (Bloch)	E	E	E
60.	<i>M. (Osteobagrus) aor</i> (Hamilton)	E	E	E
61.	<i>M. (Osteobagrus) seenghala</i> (Sykes)	E	E	E
62.	<i>Rita pavimentata</i> (Gunther)	E	E	E
63.	<i>R. rita</i> (Hamilton)	-	-	E

⑦

ANNEXURE -

*64.	<i>Amblyceps mangois</i> (Hamilton)	E	-	E
65.	<i>Gagata itchkeea</i> (Sykes)	E	-	E
66.	<i>Glyptothorax lonah</i> (Sykes)	E	-	E
*67.	<i>Laguvia ribeiroi</i> (Hora)	E	-	E
68.	<i>Clupisoma garua</i> (Hamilton)	E	E	E
69.	<i>Heteropneustes fossilis</i> (Bloch)	E	E	E
70.	<i>Clarias batrachus</i> (Linnaeus)	E	-	E
71.	<i>Anguilla bengalensis</i> (Gray)	E	E	-
72.	<i>Xenentodon cancila</i> (Hamilton)	E	E	E
73.	<i>Channa gachua</i> (Hamilton)	E	E	E
74.	<i>C. marulius</i> (Hamilton)	E	E	E
75.	<i>C. punctatus</i> (Bloch)	E	E	E
76.	<i>C. striatus</i> (Bloch)	-	E	-
77.	<i>Chanda nama</i> (Hamilton)	E	E	E
78.	<i>C. ranga</i> (Hamilton)	E	E	E
79.	<i>Badis badis</i> (Hamilton)	E	-	E
80.	<i>Nandus nandus</i> (Hamilton)	E	E	E
81.	<i>Glossogobius giuris giuris</i> (Hamilton)	E	E	E
82.	<i>Mastacembelus armatus armatus</i> (Lacepede)	E	E	E
83.	<i>M. paucalus</i> (Hamilton)	E	E	E
84.	<i>Silonia silondia</i> (Hamilton)	-	E	-
85.	<i>Anabas testudineus</i> (Bloch)	-	-	E
86.	<i>Lebistes reticulatus</i> (Menon)	-	-	E
87.	<i>Oxygaster bacaila</i> (Hamilton)	-	E	E
88.	<i>Eutropiichthys vacha</i> (Hamilton)	-	-	E
89.	<i>Rhinomugil corsula</i> (Hamilton)	-	-	E
90.	<i>Colisa fasciatus</i> (Bloch & Schneider)	-	-	E

1. = Karamchandani et al. (1967)

2. = Department of Fisheries Govt of M.P. Survey Report, 1971

3. = Rao et al. (1991)

\* = Recorded by Hora &amp; Nair (1941)

E = Encountered



ANNEXURE-1

(8)

**PROCEEDINGS OF THE MEETING DATED 14<sup>TH</sup> NOV., 2002  
OF THE COMMITTEE TO DECIDE THE ISSUES LINKED  
WITH PROTECTED AREAS FOR CONSERVATION AND  
MANAGEMENT OF WILDLIFE DISPLACED DUE TO  
SUBMERGENCE CAUSED BY NARMADA PROJECTS.**

(List of Participants is enclosed)

This meeting was held on account of directions received in the meeting dated 3<sup>rd</sup> August, 2002 chaired by the Chief Secretary, GoMP. The Chief Secretary desired that the committee should consider the following :-

- (i) Suggestions made in the reports of studies by FONS, Bhopal, W.I.I. Dehradun & S.F.R.I., Jabalpur, justification of works, expenditure to be incurred and arrangement for sharing of cost between Narmada Sagar Complex (Indira Sagar, Omkareshwar & Maheshwar Projects) and Sardar Sarovar Projects.
- (ii) Consider Lower Narmada Basin as a unit & review the recommendations of the committee made earlier regarding the suggestions included in the report of study by S.F.R.I., Jabalpur.
- (iii) Prepare a cogent plan for conservation & management of wildlife in the impact areas of Narmada Sagar Complex projects (Indira Sagar, Omkareshwar & Maheshwar Projects) and Sardar Sarovar Project in the Lower Narmada Zone, by conceiving the areas under these projects environmentally, a complete unit.

The committee examined the issue of creation of protected areas and sharing of cost in light of the details mentioned below.

2. The committee observed that a report from World Wildlife Organization has narrated the ecology of Narmada Valley Forests in the following terms :-

“The Narmada Valley Dry Deciduous Forests [IMO207] are neither exceptionally species-rich nor high in numbers of endemic species. But this eco-region still retains more than a third of its natural habitat in several large blocks that exceed 5,000 sq km in area. In this bio-region, such large dry forest habitats present rare and important opportunities to conserve Asia's largest carnivore, the tiger (*Panthera tigris*).”

⑨

3. This is also reflected in the rationale behind the conditions laid down by GoI, MoE&F in the clearances issued from environmental angle for Omkareshwar and Maheshwar Projects that contiguity of the protected areas be maintained and is described as under :-

I. Omkareshwar Multipurpose Project :- Condition No. (ii) imposed in GoI, MoE&F's memorandum No.J-11016/S/84-JA-1, dated 13.10.1993 states that-

"A comprehensive scheme for protecting the vegetation cover and the wildlife on southern side should be ensured by creation of protection areas such as National Parks/Sanctuaries, the extent and size of which should be decided in consultation with the Wildlife Institute of India, Dehradun, NVDA and the State Departments. This plan should be such that it is contiguous from Narmada Sagar to Maheshwar and should cover the migratory corridors, protection measures, etc. This action plan should be submitted by end of March, 1994 when the Wildlife Institute study is to be completed."

II. Maheshwar Hydel Power Project:- Condition No. (v) laid down in GoI, MoE&F, Memorandum No. 11016/120/83-1A-1 dt. 7/1/1994 states that-

"On the basis of studies and surveys carried out in Narmada Sagar and Omkareshwar Projects, the Wildlife Institute of India has recommended setting up of a national park in an area of 470.66 sq km in Dewas and Khandwa forest divisions and also a sanctuary in Punasa reserve forest covering 39 sq km. The Institute has also suggested creation of 500 sq km buffer zone around the National Park and penumbral wildlife conservation as well as for eco-development.

4. Three studies pertaining to flora and fauna mentioned below were assigned to the consultants by the Narmada Valley Development Authority, Bhopal and reports have been received :-

- i) 'Impact Assessment of Madhya Pradesh Lands to be submerged under Sardar Sarovar Project and Adjoining Ecosystem : Flora, Fauna and other Biotic Components' by

State Forest Research Institute, Jabalpur- Report received in 1994.

- ii) 'Impact Assessment Studies of Narmada Basin and Omkareshwar Projects on Flora, Fauna with Attendant Human Aspects' by Wildlife Institute of India, Dehradun- Report received in 1994.
- iii) 'Wildlife Retrieval and Conservation Plan for Indira Sagar Project' by Friends of Nature Society, Bhopal- Report received in 1996.

5. The Committee has gone through the above reports and considered various recommendations made therein. Following ones are worth mentioning :-

(A) Regarding Sardar Sarovar :-

- i. State Forest Research Institute recommended creation of two wildlife sanctuaries namely Bokarata (35 sq km) in Badwani district and Mathwad (347 sq km) in Jhabua district.
- ii. Treatment of catchment area and social forestry in 185 villages in the project impact area in Madhya Pradesh due to Sardar Sarovar Project.

(B) Regarding Indira Sagar :-

Studies at serial No. 4(ii) & 4(iii) above recommended creation of a National Park and two sanctuaries namely Surmanya and Mandhata (These three proposed protected areas encompass nearly 760 sq.km. The State Wildlife Committee, recommended the constitution of protected areas in 491.552 sq km) in the areas adjoining to the submergence area of Indira Sagar dam.

6. The Committee in its earlier report dated 7<sup>th</sup> & 14<sup>th</sup> June'2002 had recommended constituting one national park and two sanctuaries in the forests falling in Dewas and Khandwa districts with view to conserve wildlife in lieu of forest area submerged in Narmada Sagar. The details of the national parks and wildlife sanctuaries are as follows :-

(Area in sq.km)

(a)

Sl. No.	Name of		Area (sq km) recommended in the studies by FONS, Bhopal/WII Dehradun				Area (sq km) recommended by the committee
	Protected Area	Study Maker	Reserve Forest	Protected Forest	Other Lands	Total	
1	Omkareshwar National Park	FONS	423.20	39.04	18.09	480.33	250.824
		WII	--	--	--	475.22	
2	Surmánya Sanctuary	FONS	153.83	--	--	153.83	174.003
		WII	--	--	--	163.70	
3	Mandhata Sanctuary	FONS	115.26	10.15	--	125.41	66.725
		WII	--	--	--	119.96	
	TOTAL :-	FONS	692.29	49.19	18.09	759.57	491.552
		WII	--	--	--	758.88	

7. The Committee has included such Reserved Forest in the protected areas which includes no villages inside the proposed area of National Park and two Wild Life Sanctuaries.

8. The committee also worked out the expenditure for a period of 5 years, which was given in its earlier report.

9. List of wild animals observed in SSP area as reported by State Forest Research Institute (SFRI) in the report on "Impact Assessment of Madhya Pradesh Lands to be submerged under SSP and Adjoining Ecosystem : Flora, Fauna and Biotic Component" includes Schedule-I animals given in the Wildlife Protection Act-1972/1991 notified by GoI. These are required to be conserved in the project impact area of SSP.

10. The forests of Madhya Pradesh which are coming under the submergence of these reservoirs are located in two agro-climatic zones namely, (1) Nimar plateau and (2) Jhabua hills and plateau. There are variations in soil type, climate, physiography and the forests of the area. Forests in Khandwa belong to tropical moist deciduous forests predominantly associated with black cotton soils. These forests are dense and better in site quality. Dry deciduous mixed forests are also found in areas with poor site conditions associated with shallow soils.

(12)

As we move westward to Jhabua and Badwani, the general impression was that the site conditions become poorer as rainfall and other conditions become adverse. The soils associated with hill topography result in high amount of soil erosion and poor form and density of vegetation. Geology of Narmada Basin suggests that black cotton soils or their deposits as a part of alluvial river system is found all along the course of the river. The rainfall in the Narmada Valley generally goes on decreasing as one moves towards the west but after Badwani or thereabout it starts increasing. The increase noticed towards west i.e. Jhabua is from 635 mm to 1016 mm per annum. Average rainfall in Amarkantak is 1500 mm (& above), at Khandwa it is 1016 mm and in Badwani, it is lowest about 600 mm per annum. There is a considerable variation in the edaphic conditions of two different agro-climatic zone resulting in change in vegetation. The proposed protected areas under the Narmada Sagar project will not be able to cover the physiography, site conditions, vegetation and wildlife of the forest area coming under submergence of Sardar Sarovar. Therefore the committee feels that it was necessary to create protected areas representing these variations.

11. The report submitted by SFRI, Jabalpur indicates that in the submerged area of Sardar Sarovar many species listed in Schedule I of Wild Life (Protection) Act 1972 are found in the area. As such, Committee feels that there is a need to review the decision taken earlier by State Wildlife Committee wherein it was considered that creation of Mathwad and Bokarata Sanctuaries was not required.

12. The committee considered the recommendation of SFRI, Jabalpur for constituting two wildlife sanctuaries (1) Bokarata and Mathwad in lieu of forest area coming under the submergence of Sardar Sarovar. This committee in its earlier meeting dated 31.7.2000 which was attended only by two members recommended not to create these wildlife sanctuaries. This matter was again discussed within the members of the committee and most of the members felt that since, the forest area of proposed Bokarata sanctuary has been encroached heavily, the constitution of this wildlife sanctuary would not serve any purpose and would create social and other problems. This committee, however, is of the view that besides Mathwad sanctuary Kathiwada forests of Jhabua Forest Division which fall in the same agro-climatic zone be selected for another wildlife sanctuary

(13)

in lieu of forest area coming under submergence in Sardar Sarovar. The Committee also consulted working plan of Jhabua Division which also recommends protection to the habitat for wildlife management. The Committee therefore, recommends that the forest area of Kathiwada Range having an area of 100.00 sq. km. be declared wildlife sanctuary. The total costs of establishing these sanctuaries will be worked out in next meeting of the committee..

13. The SFRI report mentions creation of special type habitats in the submergence area as more than 60 islands are formed in this area. The Committee is of the view that the area of these 60 islands along with the submergence area be also declared as wildlife sanctuary.

14. There is a cascade of dams (Indira Sagar, Omkareshwar, Maheshwar and Sardar Sarovar Projects) in the lower part of the river Narmada and submergence due to a downstream project almost reaches the upstream dam. Indira Sagar is a mother dam providing the largest storage as is clear from following data :-

Reservoir	Gross storage (MAF)	Live Storage (MAF)	Forest Area under submergence/ diversion in M.P.
Indira Sagar (Narmada Sagar)	9.9	7.9	40,332
Omkareshwar Project	0.80	0.23	5,829.850
Maheshwar Project	0.396	0.023	NIL
Sardar Sarovar Project	7.7	4.73	2,731.708

15. The Committee invited Shri L.K. Wagh, Advisor, NVDA about suggesting the sharing mechanism of costs between Madhya Pradesh, Gujrat and other states for establishing the National Parks and Wildlife sanctuaries in part of Narmada basin falling in Madhya Pradesh.

16. It may be stated here that Narmada Water Disputes Tribunal (NWDT) has directed sharing of costs of Sardar Sarovar Project, i.e. Unit-I (dam and appurtenant works), Unit-II (canal system) and Unit-III power houses, amongst the States as under :-

- a) Cost of Unit-I
- |             |                |
|-------------|----------------|
| M.P.        | 31.98%         |
| Gujarat     | 50.43%         |
| Maharashtra | 15.15%         |
| Rajasthan   | 2.44%          |
| Total :-    | <u>100.00%</u> |
- b) Cost of Unit-II  
 Only main canal Gujarat to be shared on cusecs  
 and Rajasthan mile basis.  
 (Rest of the cost of Unit-II  
 excluding cost of main canal  
 will be borne by Gujarat).
- c) Cost of Unit-III
- |             |                |
|-------------|----------------|
| M.P.        | 57%            |
| Maharashtra | 27%            |
| Gujarat     | 16%            |
| Total :-    | <u>100.00%</u> |

17. The NWDT also directed that Gujarat would pay to Madhya Pradesh 17.63% of the cost of Unit-I (Dam and Appurtenant works) of the Narmada Sagar (Indira Sagar) Project, as a compensation for the regulated releases made available by Indira Sagar for use at Sardar Sarovar.

18. The environmental issues were not before the NWDT. Hence no specific directions are available for sharing of cost of environmental safeguard measures.

i) Omkareshwar National Park (480 sq km) and three sanctuaries namely Surmánya (159 sq km) and Mandhata (126 sq km) are proposed in the FONS' report for creation in the areas adjoining to the Indira Sagar reservoir, the mother dam for the reservoirs of the aforesaid cascade. Cost of creating these protected areas with reduced area of 491.552 sq.km. is estimated to be Rs. 28.62 crores at 2000 price level. The cost of aforesaid National Park and three Sanctuaries meeting the requirement of total submergence areas of the three projects, i.e., Indira Sagar, Omkareshwar and Sardar Sarovar will be required to be shared by these projects in the same proportion as has been decided for dam and appurtenant works.

(15)

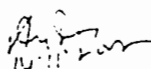
ii) Second alternative is to share the cost by the respective States in proportion to the volume of water allocated by the cascade of dams. The volume of water allocated as per NWDT award is as follows :-


- i) Govt. of Gujarat (9 MAF)
  - ii) Govt. of Madhya Pradesh (18.25 MAF),
  - iii) Govt. of Maharashtra (0.25 MAF) and
  - iv) Govt. of Rajasthan (0.50 MAF)
- given in the NWDT Award.

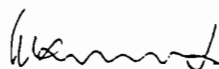
The State Govt. may decide the sharing of environmental costs on the basis of either of the above options.

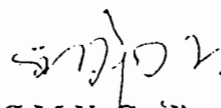
19. Regarding other issues the Committee was of the view that social forestry component be executed at project cost by the State Forest Department and vetted the estimate of Rs. 5.0945 Crores at 1999-2000 price level. Since its execution has not yet started, escalation in price @ 9% per annum may be added.

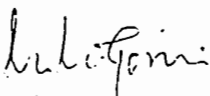
20. Treatment of catchment area lying in the impact zone would not be essential as the project impact area comprised the same area as included in the directly draining subwatersheds. As per the directions of Committee of Central Secretaries and Narmada Control Authority, the need of treating degraded areas in the project impact area was already taken care of in the catchment area treatment plan (Phase-I Directly draining) covering 1,25,725 ha implementation of which was in progress at project cost. The CAT- plan was estimated to cost of Rs. 88.35 Crore at 1993 price level. NVDA treated 1,00,268 ha up to August '02 at an expenditure of Rs. 83.27 Crore. The issue of sharing this cost of CAT would be dealt with by NCA. Hence the same is not considered here.

  
(A.K. Dubey)  
Member(E&F), NVDA, Bhopal

  
(A.S. Joshi)  
C.C.F. (Land Management)  
Bhopal.

  
(A.P. Dwivedi)  
P.C.C.F.(Wildlife), M.P.

  
(I.M.N. Goel)  
Director, W.W.F., Bhopal.

  
K.K. Goswami  
C.F. (W.L.)  
% P.C.C.F. W.L.)



(16)

**Minutes of meeting of the committee for conservation & management of wildlife affected due to submergence of Narmada Sagar & Sardar Sarovar Projects (Meeting dated 14.11.2002 at 12 am in the chamber of PCCF (Wildlife), Van Bhawan, Bhopal).**

### List of Participants

1. Shri A.P.Dwivedi), P.C.C.F. (Wildlife), Madhya Pradesh, Bhopal.
2. Shri A.K. Dubey, Member(Env't.& Forests), N.V.D.A., Narmada Bhawan, Bhopal.
3. Shri I.M.N. Goel, Director, W.W.F., Bhopal.
4. Shri A.S. Joshi, C.C.F.(Land Management), Bhopal.
5. Shri K.K. Goswami, Conservator of Forests (Wildlife), M.P. Bhopal-  
A nominated Member of Wildlife Advisory Board-M.P.

वन विभाग

विषय:- सरदार सरोवर डूब क्षेत्र के कारण गठित किए जानेवाले अभ्यारण्य से संबंधित प्रस्तावित व्यय का विस्तृत विवरण।

प्रधान मुख्य वन संरक्षक  
का कार्यालय

नर्मदा नदी पर बनाये जाने वाले विभिन्न बाँधों के कारण डूब में आ रहे वनक्षेत्र के कारण वन्यजीवों के संरक्षण हेतु प्रस्तावित योजना के संबंध में समिति द्वारा पूर्व में विचार किया गया था। इंदिरासागर डूब क्षेत्र की प्रतिपूर्ति हेतु एक राष्ट्रीय उद्यान एवं दो अभ्यारण्य, ओंकारेश्वर राष्ट्रीय उद्यान एवं सुरमन्या तथा मान्धाता अभ्यारण्य के गठन का प्रस्ताव किया गया था, जिस पर सहमति हो चुकी है। ओंकारेश्वर राष्ट्रीय उद्यान एवं सुरमन्या तथा मान्धाता अभ्यारण्य के निर्माण पर रु० 28.62 करोड़ का व्यय अनुमानित किया गया है। व्यय का विवरण पूर्व में दिया जा चुका है। सरदारसरोवर के निर्माण के फलस्वरूप डूब में आ रहे वनक्षेत्र के कारण राज्य वन अनुसंधान संस्थान, जबलपुर द्वारा प्रस्तावित दो अभ्यारण्य क्षेत्र के निर्माण के बारे में समिति ने विचार किया था और समिति ने अपनी अनुशंसा अपनी बैठक दिनांक 14 नवम्बर, 2002 में किया था। उस बैठक में व्यय का विवरण नहीं दिया गया था। समिति ने मथवाड़ एवं कट्ठीवाड़ा अभ्यारण्य के गठन से संबंधित व्यय का विस्तृत विवरण तैयार किया है, जो निम्नानुसार है:-

- |                         |                                   |
|-------------------------|-----------------------------------|
| (1) मथवाड़ अभ्यारण्य    | कुल अनुमानित व्यय 21.76 करोड़ रु० |
| (2) कट्ठीवाड़ अभ्यारण्य | कुल अनुमानित व्यय 13.97 करोड़ रु० |

कुल अनुमानित व्यय	35.73 करोड़ रु०
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समिति द्वारा तैयार दो अभ्यारण्यों के व्यय का अनुमान संलग्न प्रेषित है।

प्रधान मुख्य वन संरक्षक (वन्यप्राणी)  
मध्यप्रदेश, भोपाल।

उपाध्यक्ष, नर्मदा घाटी विकास प्राधिकरण

7 (EOP)

S.M. (Behr)

## Cost Estimates for Kathiwada Sanctuary

Total area of the proposed Kathiwada Sanctuary is 92.33 Sq.Km.. There are 6 villages inside the proposed Sanctuary and 21 villages on the periphery. In wildlife management, Eco- dev, habitat dev., protection, Infrastructure, Research and establishment are the main components. Component wise cost estimates have been prepared as under:-

A. Eco-Development and energy saving measures: The main activities under the Eco-development and energy savings will be:-

- (1) Fuel wood plantation
- (2) Bamboo plantation
- (3) Gobar gas plants
- (4) Pasture development
- (5) Land leveling
- (6) Irrigation
- (7) Nistar Talab
- (8) Construction Wells
- (9) Construction of School building
- (10) Approach Roads etc.

It is proposed that on an average Rs. 15.00 lakhs will be spent on each village for Eco-Development.

Total Cost = 15.00 lakh x 27 = 405 lakhs

B. Habitat Improvement: Food, water and space are the main components of Wildlife habitat and hence following items are proposed:-

(a) Water hole creation

- |  |                    |           |
|--|--------------------|-----------|
| (i) Stop dams -  | 18 @ 4 lakh        | = 72 lakh |
| (ii) Talab -   | 40 @ 1 lakh        | = 40 lakh |
| (iii) Maintenance of water hole which includes cleaning and creation of temporary earthen dam (For five years) | 1.60 lakh per year | = 8 lakh  |

(b) Habitat Improvement

- |  |                       |              |
|--|-----------------------|--------------|
| (i) Meadow creation by uprooting woody species | 10 meadows @ 0.5 lakh | = 5.00 lakh  |
| (ii) Uprooting weeds                           |                       | = 7.00 lakhs |
| (iii) Uprooting of lantana                     |                       | = 7.00 lakh  |

(19)

(iv) Soil and water conservation	= 7.00 lakh
<b>Total (Habitat Improvement)</b>	<b>= 136.00 lakh</b>

**C. Protection:** Protection is top most priority area of wildlife management. Construction of patrolling camps, erection of barriers, construction of roads, creations of firelines, construction of watch towers, construction wireless tower, wireless sets (fixed mobile hand sets), inoculation of domestic animals, vehicles for speedy communication etc. are the main components of protection.

Survey and demarcation	= 20.00 lakh
Patrolling camps (10) @ 2.00 lakh	= 20.00 lakh
Forester's Qtr. (6) @ 2.5 lakh	= 15.00 lakh
Forest Rangers (2) @ 3.50 lakh	= 7.00 lakh
ACF (1) @ 5.00 lakh	= 5.00 lakh
Checking barriers(5) @ 2.00 lakh	= 10.00 lakh
Roads (100 Km.)@ 1.00 lakh	= 100.00 lakh
Inspection path (75 Km.) @ 0.25 lakh	= 18.75 lakh
Creation of firelines (12 m)-200 Km.@ 0.05 lakh	= 10.00 lakh
(6 m)-400 Km @ 0.025 lakh	= 10.00 lakh
Const. of watch tower (12) @ 1.00 lakh	= 12.00 lakh
Const. of wireless tower (4) @ 2.00 lakh	= 8.00 lakh
Wireless sets	
Fixed (5) @ 0.80 lakh	= 4.00 lakh
Mobile (4) @ 0.80 lakh	= 3.20 lakh
Hand set (15) @ 0.15 lakh	= 2.25 lakh
Binoculars (15) @ 0.15 lakh	= 2.25 lakh
Fire arms (15) @ 0.25 lakh	= 3.75 lakh
Jeep (2) @ 4.00 lakh	= 8.00 lakh
Tractor with Tanker (2) @ 4.50 lakh	= 9.00 lakh
Mazda canter (1) @ 6.00 lakh	= 6.00 lakh
Motor Cycle (12) @ 0.40 lakh	= 4.80 lakh
Fencing with chainink (100 Km) @ 2.00 lakh	= 200.00 lakh
Inoculation of domestic animals (2.00 lakh per year for 5 years)	= 10.00 lakh
<b>Total ( Protection)</b>	<b>= 489.00 lakh</b>

(20)

**D. Infrastructure:**

Rest house (2) @ 25.00 lakh	= 50.00 lakh
Hutments (4) @ 4.00 lakh	= 16.00 lakh
Museum & demonstration centre (1) @ 15.00 lakh	= 15.00 lakh
Publications	= 10.00 lakh
Mini bus (1) @ 10.00 lakh	= 10.00 lakh
Training to Guides	= 2.00 lakh
Signages	= 5.00 lakh
<hr/>	
<b>Total (Infrastructure)</b>	<b>= 108.00 lakh</b>
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**E. Research:**

Research on	
Grassland	
Vegetation	
Preparation of check lists etc.	= 10.00 lakh
GIS, GPS, digitization, Computer, Software	= 30.00 lakh
Translocation of animal	= 25.00 lakh
(Tranquilization equipments and medicines and execution of translocations)	
<hr/>	
<b>Total (Research)</b>	<b>= 65.00 lakh</b>
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**F. Establishment:**

Office of ACF (1) @ 5.00	= 5.00 lakh
Office of the Forest Rangers(2) @ 4.00	= 8.00 lakh
Residential for driver(6) @ 1.50 lakh	= 9.00 lakh
Residential LDC (2) @ 2.00 lakh	= 4.00 lakh
Residential Watchmen (2) @ 1.00 lakh	= 2.00 lakh

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Residential for driver(6) @ 1.50 lakh	= 9.00 lakh
Residential LDC (2) @ 2.00 lakh	= 4.00 lakh
Residential Watchmen (2) @ 1.00 lakh	= 2.00 lakh
Residential wireless operators (8) @ 1.00 lakh	= 8.00 lakh
Construction of Garage (6) @ 0.50 lakh	= 3.00 lakh
Const. of Store (2) @ 1.00 lakh	= 2.00 lakh
Electricity connections -	= 5.00 lakh
Office Furniture (for 3 offices)	= 3.00 lakh
<b>Total (Establishment)</b>	<b>= 44.00 lakh</b>
<b>G. Recurring Expenditure @ 30.00 lakh on 5 years</b>	<b>= 150.00 lakh</b>

### Abstract of Cost Estimates:

A. Eco-Development and energy saving measures	= 405.00 lakh
B. Habitat Improvement	= 136.00 lakh
C. Protection	= 489.00 lakh
D. Infrastructure	= 108.00 lakh
E. Research	= 65.00 lakh
F. Establishment	= 44.00 lakh
G. Recurring Expenditure	= 150.00 lakh
<b>Grand Total</b>	<b>= 1397.00 lakh</b>

*(A.P. Divedi)*

*(A.K. DUBEY)*

*(B.P. SINGH)*  
Conservator of Forests

INDORE

6/11/16  
Field Director  
Kanha National  
Mandla

## Cost Estimates for Mathwad Sanctuary

Total area of the proposed Mathwad Sanctuary is 237.3 Sq.Km.. There are 15 villages inside the proposed Sanctuary and 18 villages on the periphery. In wildlife management, Eco- dev, habitat dev., protection, Infrastructure, Research and establishment are the main components. Component wise cost estimates have been prepared as under:-

**A. Eco-Development and energy saving measures:** The main activities under the Eco-development and energy savings will be:-

- (1) Fuel wood plantation
- (2) Bamboo plantation
- (3) Gobar gas plants
- (4) Pasture development
- (5) Land leveling
- (6) Irrigation
- (7) Nistar Talab
- (8) Construction Wells
- (9) Construction of School building
- (10) Approach Roads etc.

It is proposed that on an average Rs. 15.00 lakhs will be spent on each village for Eco-Development.

Total Cost = 15.00 lakh x 33 = 505 lakhs

**B. Habitat Improvement:** Food, water and space are the main components of Wildlife habitat and hence following items are proposed:-

(a) Water hole creation

(i)	Stop dams -	28 @ 4 lakh	= 112 lakh
(ii)	Talab -	55 @ 1 lakh	= 55 lakh
(iii)	Maintenance of water hole which includes cleaning and creation of temporary earthen dam (For five years)	2.00 lakh per year	= 10 lakh

(b) Habitat Improvement

(i)	Meadow creation by uprooting woody species	15 meadows @ 0.5 lakh	= 7.5 lakh
(ii)	Uprooting weeds		= 10.00 lakhs
(iii)	Uprooting of lantana		= 10.00 lakh

(23)

(iv) Soil and water conservation = 10.00 lakh

**Total (Habitat Improvement) = 214.50 lakh**

**C. Protection:** Protection is top most priority area of wildlife management. Construction of patrolling camps, erection of barriers, construction of roads, creations of firelines, construction of watch towers, construction wireless tower, wireless sets (fixed mobile hand sets), inoculation of domestic animals, vehicles for speedy communication etc. are the main components of protection.

Survey and demarcation	= 30.00 lakh
Patrolling camps (20) @ 2.00 lakh	= 40.00 lakh
Forester's Qtr. (12) @ 2.5 lakh	= 30.00 lakh
Forest Rangers (2) @ 3.50 lakh	= 7.00 lakh
ACF (1) @ 5.00 lakh	= 5.00 lakh
Checking barriers(5) @ 2.00 lakh	= 10.00 lakh
Roads (200 Km.)@ 1.00 lakh	= 200.00 lakh
Inspection path (150 Km.) @ 0.25 lakh	= 37.50 lakh
Creation of firelines (12 m)-250 Km.@ 0.05 lakh	= 12.50 lakh
(6 m)-600 Km @ 0.025 lakh	= 15.00 lakh
Const. of watch tower (24) @ 1.00 lakh	= 24.00 lakh
Const. of wireless tower (4) @ 2.00 lakh	= 8.00 lakh
Wireless sets	
Fixed (5) @ 0.80 lakh	= 4.00 lakh
Mobile (4) @ 0.80 lakh	= 3.20 lakh
Hand set (15) @ 0.15 lakh	= 2.25 lakh
Binoculars (15) @ 0.15 lakh	= 2.25 lakh
Fire arms (15) @ 0.25 lakh	= 3.75 lakh
Jeep (2) @ 4.00 lakh	= 8.00 lakh
Tractor with Tanker (2) @ 4.50 lakh	= 9.00 lakh
Mazda canter (1) @ 6.00 lakh	= 6.00 lakh
Motor Cycle (12) @ 0.40 lakh	= 4.80 lakh
Fencing with chainink (200 Km) @ 2.00 lakh	= 400.00 lakh
Inoculation of domestic animals (2.00 lakh per year for 5 years)	= 10.00 lakh
<b>Total ( Protection)</b>	<b>= 872.75 lakh</b>



(24)

**D. Infrastructure:**

Rest house (2) @ 25.00 lakh	= 50.00 lakh
Hutments (4) @ 4.00 lakh	= 16.00 lakh
Museum & demonstration centre (1) @ 15.00 lakh	= 15.00 lakh
Motor boats (Big) (4) @ 5.00 lakh	= 20.00 lakh
Motor boats(mini)(10) @ 2.50 lakh	= 25.00 lakh
Publications	= 10.00 lakh
Mini bus (1) @ 10.00 lakh	= 10.00 lakh
Training to Guides	= 2.00 lakh
Signages	= 5.00 lakh
Elephants(2)	= 10.00 lakh
<b>Total (Infrastructure)</b>	<b>= 163.00 lakh</b>

**E. Research:**

Research on Grassland Vegetation Preparation of check lists etc.	= 10.00 lakh
GIS, GPS, digitization, Computer, Software	= 30.00 lakh
Translocation of animal (Tranquilization equipments and medicines and execution of translocations)	= 25.00 lakh
Reptilia development	= 50.00 lakh
<b>Total (Research)</b>	<b>= 115.00 lakh</b>

**F. Establishment:**

Office of ACF (1) @ 5.00	= 5.00 lakh
Office of the Forest Rangers(2) @ 4.00	= 8.00 lakh

(25)

Residential Jeep driver(6) @ 1.50 lakh	= 9.00 lakh
Residential LDC (2) @ 2.00 lakh	= 4.00 lakh
Residential Watchmen (2) @ 1.00 lakh	= 2.00 lakh
Residential wireless operators and boat drivers (20) @ 1.00 lakh and Mahawat	= 20.00 lakh
Construction of Garage (6) @ 0.50 lakh	= 3.00 lakh
Const. of Store (2) @ 1.00 lakh	= 2.00 lakh
Electricity connections	= 5.00 lakh
Office Furniture (for 3 offices)	= 3.00 lakh
<b>Total (Establishment)</b>	<b>= 56.00 lakh</b>
G. Recurring Expenditure @ 50.00 lakh on 5 years	= 250.00 lakh

### Abstract of Cost Estimates:

A. Eco-Development and energy saving measures	= 505.00 lakh
B. Habitat Improvement	= 214.50 lakh
C. Protection	= 872.75 lakh
D. Infrastructure	= 163.00 lakh
E. Research	= 115.00 lakh
F. Establishment	= 56.00 lakh
G. Recurring Expenditure	= 250.00 lakh
<b>Grand Total</b>	<b>= 2176.20 lakh</b>

*Signature*  
A.P. Dwivedi

*Signature*  
(AKDUBEY)

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*Signature*  
(B.P. SINGH)  
Conservator of Forests  
INDORE 52

*Signature* - 16/12/02  
Field Director  
Kanha National Park  
Mandla



केवल सरकारी प्रयोग के लिए  
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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**इकतालिसवी बैठक की कार्यसूची**  
**Agenda for the 41<sup>th</sup> meeting**

स्थान : पर्यावरण भवन, नई दिल्ली  
Venue : Paryavaran Bhawan, New Delhi

दिनांक : 1 नवम्बर 2004 11.30 बजे पूर्वाह्न  
Date : 1<sup>st</sup> November, 2004, 11.30 A.M.

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**अक्टूबर, 2004**

**Indore**  
**October, 2004**

## ENVIRONMENT SUB-GROUP AGENDA FOR THE 41<sup>st</sup> MEETING

### I N D E X

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XLI-2(190)	Review of the Status of Environment Safeguard Measures. <b>A) Construction Schedule: : Sardar Sarovar Project:</b>	2
	(a) Catchment Area Treatment (b) Compensatory Afforestation : Planning And Progress (c) Command Area Development And Environment Management Of Downstream Areas (d) Flora, Fauna & Carrying Capacity (e) Seismicity and Rim Stability (f) Health Aspects (g) Archaeology & Anthropology (h) Down Stream Environment	2
	<b>B) Status of readiness on implementation of the environment safeguard measures commensurate with raise in the height of the dam to EL 121.92 m.</b>	17
XLI-3(191):	Review of the Status Of Environment Safeguard Measures Indira Sagar Project : <b>A. Construction Schedule:</b>	18
	<b>B) Current Status of Implementation of the Environmental safeguard measures for the Indira Sagar Project is presented below for a review by the Members</b> (a) Catchment area treatment (b) Compensatory afforestation (c) Command area development and downstream (d) Flora, fauna,& carrying capacity (e) Seismicity & Rim Stability (f) Health aspects (g) Archaeology (h) anthropology	18
XLI-4 (192)	Sharing the cost of the treatment of freely draining critically eroded catchment area	30
XLI- 5 (193)	Review of the action taken on the decision of the previous meetings.	32
	<b>A. Sardar Sarovar Project : Catchment Area Treatment:</b> 1. Phase-I Establishment of Silt Monitoring Stations.	32
	<b>B. Monitoring works in Maharashtra</b>	32
	<b>C. Sardar Sarovar Project : Environment Management</b>	33
	<b>D. Cost Estimates For Preparation Of Action Plans And Implementation Of Environmental Safeguard Measures</b>	33
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<b>Annex No</b>	<b>Contents</b>	<b>Page No</b>
<b>XLI(-1)</b>	A copy of the communication, on confirmation of Minutes of 40 <sup>th</sup> Meeting of ESG, received from Prof Ramaseshan	35
<b>XLI(-2)</b>	A copy of the proposal on formation of sanctuaries for SSP, received from the Govt. of M.P vide dated 7 <sup>th</sup> July 2004 & request for inclusion of agenda items for discussions by the ESG on ISP & SSP.	36-38
<b>XLI(-3)</b>	A copy of the letter dated 8 <sup>th</sup> July 1992 conveying decision of the Govt. of India regarding extent of area to be treated at the cost of the project	39-40

## ENVIRONMENT SUB-GROUP AGENDA FOR THE 41<sup>st</sup> MEETING

### Item No. XLI-1(189) : CONFIRMATION OF MINUTES OF THE 40<sup>th</sup> MEETING

Minutes of 40<sup>th</sup> Meeting of Environment Sub-Group of Narmada Control Authority were circulated to all Members and Invitees vide NCA Office letter No.Env-3(40)/2004/2779-2818 dated 6<sup>th</sup> August, 2004.

Request received from Prof. S. Ramaseshan regarding Corrections in the minutes in line-2, para-1 on Page 16 C: Study of the Implementation of the environment safeguard measures corresponding to 110.64m height of SSP is enclosed at **Annex –XLI (1)**.

#### As recorded in the Minutes

#### As suggested by Prof. Ramaseshan

"Prof. S. Ramaseshan desired that copies of the plans and reports which formed a part of discussions during the meetings of the Sub-Group should be made available to him in advance to that these could be studied and suggestions could be offered during the discussions.

However, the Sub-group felt that the Agenda papers circulated to the Members were quite elaborate and sufficient for discussions. Specific request of any Member, may, however, be met to the extent possible.."

Prof. S. Ramaseshan observed that details, generally presented (as Annexure) in the Agenda Notes of earlier Meetings of the Sub Group were helpful in understanding the technical implications of the environmental aspects. Unfortunately they are missing in the Agenda Notes recently. Because of their usefulness, Prof. Ramaseshan suggested the continuation of the earlier practice. In particular he mentioned that in an earlier meeting, he could point out an error in the backwater curve only because these details were available in the Agenda Notes.

The Chairman stated that, while the new practice may continue, if and when any member requested for additional information, it be made available to him before the meeting by the Secretariat.

The sub-group may discuss & confirm the minutes.

**Item No. XLI-2(190): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES OF SARDAR SAROVAR PROJECT**

**A. CONSTRUCTION SCHEDULE:**

Height of Sardar Sarovar Dam has been raised to EL 110.64 mts by 30.6.2004 on the basis of the recommendations of Environment and R&R Sub-groups of the NCA and subsequent permission of the NCA. The resulting impoundment upstream of SSP extended up to 141 km. from the dam site submerging 11,500ha, out of a total of 37,533 ha. as ascertained from the area capacity curve of the SSP annexed with the Detailed Project Report (DPR).

It is proposed to raise the dam height further to EL 121.92 mts by the end of June, 2005. To facilitate a review of the compliances on the conditions stipulated by the MOEF while according forest and environmental clearances to the project and subsequent directions of the Environment Sub Group the status of implementation of Environment Safeguard Measures is presented below for the consideration of the Sub Group.

**(a) CATCHMENT AREA TREATMENT**

Project authorities were required to prepare plans for treating those critically degraded sub-watersheds which were identified as directly draining into the reservoir (Phase-I). The implementation of the plan was to be pari-passu with the construction of the dam

The balance sub-watersheds were to be treated under Phase-II programme for implementation in a time frame to be determined separately.

**o PHASE-I PROGRAMME (1,79,180 ha.). (QUANTITATIVE) at FRL.**

STATE	Targets (ha.)		Achievements		Status of Compliance
	No. of Sub-water-sheds	Area(ha.)	No. of Sub-water-sheds	Area(ha.) at the cost of Project	
Gujarat	15	29157	15	29157	Complied
Maharashtra	17	24298	17	23295 *	Complied
Madhya Pradesh	42	125725	42	110712 *	Complied

- Balance areas were not available for treatment.



### PHASE-I PROGRAMME (QUALITATIVE)

To assess the success or failure of the CAT measures implemented at the cost of huge investments and for ensuring that structures were maintained and remained functional monitoring through establishment of silt studies stations / remote sensing was directed by the Sub-group earlier

During the 40<sup>th</sup> meeting, while reviewing the progress and arrangements made for the purpose, it was directed that dedicated and focused monitoring for assessment of the CAT works should be a continuous process and arrangements made for the same should be continued.

	Silt Monitoring Stations	Assessment through Remote Sensing
Govt., of Gujarat	Final Report was awaited	Complied
Govt., of Maharashtra	Non forest areas: 2 Stations were established	Forest areas: FSI Nagpur was carrying out the works
Govt., of Madhya Pradesh	Central Soil Research and Training Institute was being requested	Not initiated

Progress achieved may please be presented by Gujarat, Maharashtra and Madhya Pradesh.

#### (b) COMPENSATORY AFFORESTATION : Planning and progress

13,386 ha forest land was diverted by MOEF vide it's order of 1987, with certain conditions. The main conditions were as follows:

1. For every hectare of forestland submerged or diverted for construction of the project there should be Compensatory afforestation on one hectare of non-forest land **plus** penal reforestation on two hectares of degraded forest.
2. For the 4,200.00 hectares of forestland in Maharashtra, which is to be used for R&R, an equal area of non-forest land **or** double the area of degraded forest should be planted.

#### COMPENSATORY AFFORESTATION (QUANTITATIVE) upto FRL.

STATE	Targets (ha)	Achievements (ha)	Status of Compliance
Govt., of Gujarat	13,950	13,950	Completed
Govt., of Maharashtra a) For Submergence b) For R&R works	19,465.62 4,200	19,378 4197.5	Completed*
Govt., of Madhya Pradesh	8,737	8,737	Completed

\* 90 ha. area not available for treatment hence reported complete.



**COMPENSATORY AFFORESTATION (QUALITATIVE)**

STATE	Studies on neo ecosystem	Success rate		Transfer to territorial forest divisions
Gujarat As per GOG's letter dated 23.06.04	Report awaited	survival %	Area	Reported to be completed but details of notification etc are awaited
		Non Forest Area in Kuchchh.4,650 ha.		
		> 50%	50% area	
		30to50%	38% area	
		below 30%	12% area	
		Forest Area (9,300 ha.)		
		Awaited	Awaited	
Maharashtra GOM letter 5 <sup>th</sup> July 1995 & 27 <sup>th</sup> Jan2003	Not relevant	In most of the areas survival > 50% as per information of 1995 and 2003		Complete details of notification etc. are awaited. Copies of notification available for Amrawati Circle. About 6420 ha. reportedly notified out of 10,599 ha.
Madhya Pradesh As per GoMP's letter dated 21.06.04	Not relevant	survival %	Area	Out of the 2184 ha plantations on revenue land 1623.782 ha has been notified as protected forest. Remaining area is under process of transfer at different stages in GoMP
		> 50%	45% area	
		30to50%	5% area	
		below 30%	45% area	
		fodder	5%	

**GUJARAT**

Detailed report on development of neo-ecosystem developed in Runn of Kutchch due to plantation efforts is yet awaited from GOG

**MAHARASHTRA**

During the last couple of meetings, the Chairman stated that success rate of plantation would be better appreciated if indicated along with composition of species, the year of counting and the age of plantations. During the 40<sup>th</sup> meeting, it was observed that for the areas in Maharashtra the details on the survival percentage and the area covered was not adequate. GoM was requested for providing detailed information as suggested

**MADHYA PRADESH**

Similarly, for the areas in Madhya Pradesh, the rate of survival percentage in almost 45% plantation area was almost less than 30% which was a matter of concern. It was suggested by the Sub-group that in order to appreciate the efforts made by the GoMP for taking up plantations in refractory areas, the norms / yardstick

for assessing success or failure of the plantations should be made available to the Members before the next meeting.

The information requested may please be presented by the GOG/GOM/GOMP for a review by the Members

**(c) COMMAND AREA DEVELOPMENT AND ENVIRONMENT MANAGEMENT OF DOWNSTREAM AREAS**

The command area of the project has been fixed on the basis of areas included by NWDT for purposes of considering requirement of Narmada water for irrigation. In Gujarat the GCA of the project is 3.43 million hectares of which Culturable command is estimated to be 2.12 million hectares. In Rajasthan for 0.30 million ha of GCA, Command Area Development Plan is required to be prepared and implemented commensurate with the development of irrigation in the command area. Stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India require that :

- (i) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and In the wasteland/vacant land under the control of the Irrigation Department
- (ii) A programme of drainage and ground water balance studies has been completed for Mahi Narmada-Doab. Such a programme must be completed for the areas beyond the Mahi. The Bhal, Saurashtra, Kutch. Sami-Harij and other areas require this as a pre-condition.
- (iii) The State should set up a special group of experts to study the siltation aspect in the main canals under all operating conditions since such siltation, if occurs, is likely to pose a serious problem during the actual operation of this project and may require a huge expenditure for desilting as well as result into serious operational difficulties.
- (iv) State should draw up a detailed time schedule for completion within five years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area of the total command of this project.
- (v) Past experience of Irrigation projects have revealed that main and branch canals are completed up to the end but, in absence of micro-level networks to take irrigation water up to outlet, corresponding Irrigation benefits do not start accruing In spite of huge financial investment made. To avoid this, the State should draw up an implementation schedule, segment wise, for completion of canal network, in such a way that a segment of the canal network, taken up from head reaches is completed in all respects so as to make the irrigation waters available, for the designed potential of that segment, up to the outlet In that particular segment.

Status of the Planning and Implementation aspects is presented below :

<b>Gujarat</b>		
Submission of the Plan	<p>The command coming under Phase - I extends up to Narmada-Mahi Doab and areas coming under this belong to agro-climatic zone no 1 to 4 for which plan has been prepared and submitted.</p> <p>Awaited for Phase-IIA and IIB in Gujarat</p>	
Development of water delivery and drainage system	<p>Construction of Canal Phase -1 Ch 0.00 Km to 144.500 Km (Mahi crossing) along with the distributaries have been completed in all respects.</p> <p>Construction works in the reach between kms., 144.500 and kms., 263.165 i.e., NMC Phase-II-A have been completed in all respect.</p> <p>The construction works in the canal reach between kms., 263.165 and kms., 388.164 i.e., NMC Phase-II-B are in advance stage of completion. Surface drainage is being provided up to 40 ha chaks concurrently with the construction of canals.</p> <p>The work of survey investigation, planning, designing and estimating up to 40 ha. (macro planning) for 52 blocks has been completed in Phase-I. The work of survey, investigation, planning designing and estimating below 40 ha. (micro planning) for 52 blocks (excluding the four blocks falling under Bara tract) has been completed. Total 204 distributaries having length of 1166 km. and 1635 minors having length of 4766 km. have been planned under the area of 52 blocks. Out of these, total 835 km. length of distributaries and 2210 km. length of minors have been completed upto June 2004.</p>	
Implementation of environment safeguard measures	<ul style="list-style-type: none"> <li>▪ Conservation of bio-diversity Establishment of Botanical Garden</li> <li>▪ Development of aqua culture</li> <li>▪ Health plan</li> <li>▪ Water quality monitoring</li> <li>▪ Limiting the uses of pesticides / weedicides</li> <li>▪ Measures to contain water logging / salinity / alkalinity</li> <li>▪ Conjunctive use of water</li> <li>▪ Engineering measures ( vertical and horizontal drainage works)</li> <li>▪ Installation of Piezometers</li> <li>▪ Agriculture development works (On farm / Off farm)</li> <li>▪ Infrastructure / industrial development</li> <li>▪ Special provisions for Bhal and Bara tracts</li> </ul>	Progress may be reported by GOG
	<ul style="list-style-type: none"> <li>▪ Canal side plantations (15,000 ha.)</li> </ul>	Plantations raised on 3510 ha.
<b>Rajasthan</b>		
Initial plan was submitted during 1990	Sub-group directed for revision & EIA studies.	
EIA studies	Completed by WAPCOS. Area to be irrigated was increased	
Preparation of the Plan through ICCB	Plan submitted by GoR and circulated to the Members for a review. A phased programme with budget & monitoring awaited.	

### **Govt of Gujarat**

Upto date status of the actions taken to mitigate negative impact of CAD on environment may be presented.

### **Govt. Of Rajasthan**

Command area development plan for the areas in Rajasthan was received and circulated to the Members. The plan lacked details of phased programme, budget & monitoring. The comments on these issues received from the members were forwarded to the Govt of Rajasthan. During 40<sup>th</sup> meeting it was assured by the GOR representative that comments received were being attended. GoR may please present detailed report on the issues raised for a review by the Members.

### **(d) FLORA, FAUNA & CARRYING CAPACITY**

The guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora and fauna present can be assessed, listed (rare and endangered) species can be detected, if present, and appropriate conservation measures devised.

Condition stipulated by the MOEF specific to Flora & Fauna, was that the Narmada Control Authority would ensure in-depth studies on flora & fauna needed for implementation of Environmental Safeguard measures. The issues identified with respect to submergence area were identification of rare & endangered species, habitat sufficiency. Accordingly, the rehabilitation of flora fauna action plans were expected to cover the Surveys of flora & fauna in the region going to be affected due to implementation of the SSP with reference to the following

- 1) Gene pool, if any, likely to be affected.
- 2) Details of wildlife habitat in the region
- 3) Measures proposed to rehabilitate endangered species of flora fauna, if any.
- 4) Assessment of the carrying capacity of the neighbouring areas wherein the wildlife would dispose if the scheme were implemented.
- 5) Plan for rehabilitation of endangered flora & fauna.

Implementation of the recommendations contained in the EIA studies carried out by the agencies engaged by the Gujarat, Maharashtra & Madhya Pradesh were required to be implemented in time. The present status towards key recommendations on which progress is awaited are presented below :



**Govt. of Maharashtra :**

<b>Agency : School of Environmental Sciences, University of Pune:</b>		
	<b>Recommendation</b>	<b>Status of implementation</b>
1.	Management of corridors for shifting of wildlife, several corridors, passing through moderate to good ( $0 > 3$ ) vegetation cover.	Routine management by the state forest department. Report on the issue during progressive filling of the reservoir achieved so far may please be presented.
2.	Tree species with high diversity in the region (e.g. <i>Buchanania lanzan</i> ) should be conserved on large scale, in the form of multi-region seed banks. Some of these seeds from each variety, should be planted in iso-climate regions, with care, if such regions fall in degraded areas.	Buffer zone plantation in 500 m width around the wetland area of the reservoir awaits implementation
3.	Seed bank of the surface soils from low-lying (e.g. valley bottoms) areas were to be used for developing vegetation (natural) in degraded catchment.	Progress on establishment of seed banks which were to be established with the help of Forest Protection Committees working in the remote tribal areas of the Satpuda ranges, may please be reported.
4.	Conservation of soil on slopes and crests and restore adequate soil cover on undulating grounds, through deposition of soil, restoration of degraded lands, formation and retention of plant cover, improvement of high diversity vegetation cover and soil potential should be exploited and encouraged.	Assured for implementation by the GoM. Progress may please be reported.

**Govt. of Gujarat :**

M.S. University, Vadodara conducted EIA & recommended several measures for preparation of Environmental Management plan for the upstream environment.

Key recommendations focused amongst others on the following issues.

- Rehabilitation plan for the identified animals and plants
- An independent monitoring and evaluating infrastructure is an absolute necessity for successful execution of these strategies and action plans.
- To undertake development programmes in rural areas in natural watershed unit.
- Institute rational land use planning,
- Undertake reseedling programmes
- Training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state.

Implementation of the Environment safeguard measures were under progress as brought out below :

1. Entire catchment Over 30,000 ha area of Narmada river in Gujarat was treated up by soil moisture conservation measures. This included reforestation over 27204 ha area. A report on other recommendations of the M.S. University, focusing on activities of the joint forest management committees and specific recommendations for the protection and conservation of *Butea monosperma* (yellow variant) and *Radermachera xylocarpa* which were unique and represented important and rare floral element may please be presented.
2. In addition the area of Dhumkal sloth bear sanctuary was enlarged 4 times and now known as Shoolpaneshwar sanctuary. The sanctuary management plan was drawn up and was under implementation. A detailed report on development works under implementation in the Sanctuary areas and on migration of wild animals during progressive filling of the reservoir may please be presented.

#### **Govt., of Madhya Pradesh :**

State Forest Research Institute, Jabalpur carried out the EIA for the areas in Madhya Pradesh and recommended measures for drawing up of the environmental management plan. The key recommendations included the following:

1. Catchment protection work both engineering and biological coupled with joint forest management. Reestablishment of indigenous forest ecosystem and local diversity.
2. Production of fodder through agro-forestry or silvi-pastoral system through management of village wastelands. Production of bamboo through agro-forestry.
3. Using state-of-the-art technology for devising the management plans for the forests under study area with special reference to protection from fire and stringent control of grazing in the development area.
4. Intensive campaign for forestry-cum-environment awareness, peoples participation backed by development legislation should also be launched.
5. Introduction of quick growing exotics in interest of soil stabilization and meeting the requirement of people in short time.
6. 60 islands which will be found in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.
7. The area is stated comparatively scarce in wildlife with no species that was endemic but to provide alternate habitat for the wildlife two sanctuaries namely Mathwad (346.59 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district were proposed.

Govt., of Madhya Pradesh assured to implement the recommendations and following measures were taken up.

1. The catchment area treatment plan covering 125725 ha area is completed. Report on realization of the objectives of the recommendations may please be presented.
2. To cater to increase requirement of timber, fuel-wood etc., social forestry programme at an estimated cost of Rs.5.0945 crores chargeable to SSP (price level of 1999-2000) with escalation of 9% pre annum was approved by the State Wildlife Committee. Progress on implementation is awaited.
3. Joint Forest Management & Social Forestry schemes run by the State Forest Department incorporated involvement of local people. A report on the same may please be presented.
4. Steps taken for declaring the Island being formed during progressive filling of the reservoir as wildlife habitat may please be presented.
5. Studies recommended creation of two wildlife sanctuaries namely Mathwad (34.659 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district. The State Wildlife Committee had not accepted these recommendations during its earlier meeting (July, 2000). However, during its meeting convened recently (November, 2002) reconsidered its decision and recommended creation of Mathwad sanctuary (at an estimated cost of Rs.21.76 crores) as per recommendation of SFRI but instead of Bokrata Sanctuary recommended Kathiwada Sanctuary (at an estimated cost of Rs.13.97 crores) a little away but within the same ecological zone.

GoMP also proposed formulae for sharing of the cost of the development of all the sanctuaries and National parks, proposed to be developed in the basin from ISP to SSP, in the same proportion as agreed for dam and appurtenant works for ISP and SSP.

A proposal in this regard was submitted by the GoMP and was circulated along with minutes of the 40<sup>th</sup> meeting of Env. Sub-group. During this meeting, after some discussions on the issue, it was observed by the Sub-group that it would be premature to discuss creation of these sanctuaries without an EIA report. Members also requested some more time for responding to the proposal. A copy of the proposal received from the Govt. of M.P. is enclosed as **ANNEX – XLI(2)**.

Members may like to discuss and review the progress on implementation of the environment protection measures in view of the progressive impoundment which has already commenced since 1994.

#### **Aquatic Environment :**

Impoundment in SSP commenced with the closure of construction sluices during Feb 1994. The impoundment has progressed with the attainment of height of E.L. 110.64m resulting in much larger water spread, requiring a number of sequential actions, in accordance with pre & post impoundment action plan suggested by the CIC/FRI to safeguard the aquatic environment as brought out below.

Requirement by MoEF / Sub-Group	Recommendation by CICFRI	Gujarat	Maharashtra	Madhya Pradesh
Gene pool, if any, likely to be affected.	8 species considered vulnerable	Plan included Measures for vulnerable species like Hilsa ilisha, Macrobrachium rosenbergii etc, taken	Revised plan received shall be put up to the HLEG for review.	Plan to be revised to include measures for vulnerable species like Mahaseer, Rita pavementata etc
Details of wildlife habitat in the region	Breeding habitation and places identified.	Existing plan this aspect		Office of DD (F) established at Barwani, details of works awaited
Measures proposed to rehabilitate endangered species of flora fauna, if any.	Measures for rehabilitation of endangered fauna delineated	Hatcheries established & reservoir was being stocked		To be included in the revised plan , it is awaited.
Assessment of the carrying capacity of the neighboring areas wherein the wildlife would disperse if the scheme were implemented	Certain studies on water quality, prey predator relation, carbon nitrogen ratio etc were suggested	Results of water quality studies upstream, downstream & estuary available with CICFRI & Pollution Control Board were to be compiled.	Studies entrusted to CICFRI likely to be completed by Dec. 2004 and required to be translated into action plan	Limnological studies were completed. Long term hydro biological monitoring was to cover, identified parameters for water quality monitoring. This is expected to be cover in the revised action plan.
Plan for rehabilitation of endangered flora & fauna.	Draft Guidelines are proposed to be finalized during the meeting scheduled to be convened on 8.11.2004 under the Chairmanship of Jt. Secretary, Fisheries, MoA, Gol	Existing plan to be revised	Existing plan to be revised	Existing plan to be revised

Most of the suggested actions as presented in the table above awaited implementation. This will have serious consequences on the aquatic environment up-stream of the SSP.

Members may like to discuss and review.

#### **Felling of the Trees in the submergence area**

Plans for felling of trees in the forest area coming under submergence to avoid the possibility of animals being trapped in the submergence area, prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc. were required for the areas in Gujarat, Maharashtra & Madhya Pradesh. Forest areas were required to be taken up for felling in a systematic manner to avoid any possibility of the same.



### Madhya Pradesh

Felling in entire forest area coming under submergence is completed except 23,318 trees in non-forest area up to FRL as shown below. In addition, coppice crop in the forest area felled earlier shall also require felling

Districts	Forest Area			Non Forest Area		
	Total No. of trees to be felled	No. of trees felled	Balance	Total No. of Trees	No. of Trees Felled	Balance (No. of trees to be felled)
Jhabua	38,234	38234	Nil	3112	3112	Nil
Dhar	Nil	Nil	Nil	11,296	4380	6,916
Badwani	14,771	14,771	Nil	16,530	15,287	1243

### Gujarat

In Gujarat the forest area diverted was 4165.91 ha in addition 356.78 ha was diverted earlier. Thus in all 4522.69 was utilized for the SSP. Of this 4152.68 ha of the Distt. Vadodara and Bharuch required felling. The felling in Gujarat was reported to be complete. However coppice crop in the forest area felled earlier shall also require felling.

### Maharashtra

In Maharashtra an area of 6,488 ha was diverted for submergence of SSP out of which 3,157.03 ha was forest. The balance area was under river bed, nallah etc. Of this 2288.63 ha lied between 90 m & up to four meter below the FRL.

	Akkalkua Tehsil		Akrani Tehsil		Total		
	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Balance (ha)
Between 90-100 m	220.14	140.74	232.53	232.53	452.67	373.27	79.4 *
Between 100-110 m	239.72	157.10	515.73	14.11	755.45	171.21	584.24 **
Between 110 - 110.64m	Areas not marked						Not Available
Between 110-121.92 m	153.25	Awaited	460.05	Awaited	613.30	Awaited	Awaited
Between 121.92-134.68m	117.82	Awaited	349.39	Awaited	467.21	Awaited	Awaited

\* Areas could not be felled.

\*\*During meeting convened on 6<sup>th</sup> August at Mumbai by the Principal Secretary, (Energy & Environment), GoM it was reported by DCF, Sahada that most of the of area between 100m - 110m RL was clear felled except 35 ha in village Bamni which could not be felled due to objections from villagers. Further felling was ruled out as the backwater level in Maharashtra villages rose to EL 114m by 6<sup>th</sup> August, 2004.

Members may like to discuss and review the progress of felling of trees in the Maharashtra, Madhya Pradesh and Gujarat.

**(e) SEISMICITY AND RIM STABILITY**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. Although there are no specific stipulations on aspects of a seismic dam design in MOEF Clearance Order, dam design in India is regulated by a national standard developed by the Bureau of Indian Standards (BIS). The BIS has classified the Indian sub-continent into 5 zones depending on tectonic, geologic and seismic consideration using available data. The River Narmada lies in the seismo-tectonic provinces of Cambay Basin and Peninsular Shield (including the Deccan Trap) and comes under Zone 3 of the BIS classification.

Moderate seismic activity has been recorded in the Cambay Basin (up to 5.4 on the Richter scale) although the majority of seismic events in the dam vicinity have been of sub-zero magnitude. Rim stability refers to the competency of reservoir base rocks to maintain natural slopes and to contain the stored water. Under stable conditions, there should be no significant losses of reservoir water due to ground water percolation or seepage. Where rocks are found to be highly permeable, mitigation measures are needed to ensure the longevity of the reservoir.

The GOG appointed a Dam Review Panel, comprising engineers and geologists, to evaluate the report and findings and a revised final report was submitted to the project authorities in 1982. The main mitigation measures suggested were as follows :

- Construction of dams and Infrastructure (Incorporating seismic design coefficients) to withstand the maximum credible earthquake
- Establishment of seismic monitoring stations at key locations around the reservoir

ACTION	STATUS
Dam design modifications : <ul style="list-style-type: none"> <li>▪ Adoption of horizontal design coefficient of 0.125g on the recommendation of the Dam Review Panel</li> <li>▪ Installation of stress monitors in the main body of the dam</li> <li>▪ Increase of the depth of the foundation to 18m below the lowest riverbed.</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ GSI (Nagpur Division) Rim Stability studies</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ Tracer Studies by CWPRS</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ Monitoring stations</li> </ul>	Rim stability studies have been completed and well equipped 9 monitoring stations along with periphery of the reservoir 4 each on either side and one at the downstream of the Sardar Sarovar reservoir. Out of a total of 9 stations, 3 in M.P. (Alirajpur, Kukshi and Badwani, 1 in Maharashtra (Shahada) and 5 in Gujarat (Kawant, Naswadi, Kevadia, Jitgaon
<ul style="list-style-type: none"> <li>▪ Results of analysis of data from monitoring stations.</li> </ul>	Received, analysed by the dam safety review panel of the SSP during October, 2001.

It was reported during 40<sup>th</sup> meeting that Seismic activity at the dam site and around the periphery was being studied by a team of experts. The data was being analysed and annual seismological bulletins were being published. GoG had requested the Director General, Indian Seismological Research Institute (ISRI), for the evaluation of the Seismic data obtained by the SSNNL.

- Regarding up-gradation of network, the technical specifications were being worked out in consultation with IMD. The up-gradation was likely to cost about Rs.5.50 crores. GoG had planned to invite tenders by August, 2004 for the same work. The work was likely to be completed by September, 2005.

Further progress may please be reported by the GoG.

#### (f) HEALTH ASPECTS

In addition to the general obligations of the State under National policy, a specific requirement for the SSP contained in the environment clearance order of GOI was that the plans for the provision of health facilities to workers and residents of the affected areas should be prepared. Each State should take necessary measures to minimise the risk of malaria, filarial, schistosomiasis and other diseases associated with water that may result from implementation of the project. Preparation of an Action Plan for the surveillance and control of malaria was also stipulated.

As per the further directions received from the MoEF, the states were required to take up measures given in the following table.

	Mitigation measures	Gujarat	Maharashtra	Madhya Pradesh
1.	Present status of the waterborne disease in the areas	Completed	Completed	Completed
2.	Screening arrangements proposed for the work force;	Completed	Not relevant	Not relevant
3.	Epidemiological Surveillance studies	Completed	Phase-II study yet to start	Completed
4.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases	Action plan under implementation	Revised Action plan awaited	Action plan revised Aug. 2003
5.	Reinforcement proposed to the existing health delivery system	Completed	Incomplete	Incomplete
6.	Surveillance of diseases	Progressing	Weak . Being implemented under M.H.S.D.P. Use of computer to record and compile the data at district level	Weak
7.	Standard formats available with the NICD to be used for diseases surveillance purpose.	Progressing	Format circulated, implementation awaited.	Awaited
8.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	Progressing	Awaited, two water quality labs working , four being operationalised. Pada Workers are appointed to perform house to house disinfections with the help of Mediclors	Awaited
9.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.	Progressing	Awaited	Awaited
10.	Regular Entomological monitoring is suggested for alterations in ecology of the area due to irrigation / impoundment.	Progressing	Awaited, preventive measures planned.	Awaited
11.	It is suggested that sanitary latrines be established at the R&R sites and  Villagers may be educated to use these to keep the cases of Gastro diseases in check.	Progressing	Awaited Health Department is performing IEC activities to educate the people.	Awaited
12.	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited	Awaited	Awaited



The status of compliance on each of the key requirement may be discussed and reviewed by the Sub-group.

**(g) ARCHAEOLOGY & ANTHROPOLOGY**

In addition to the general obligation of the States under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out below.

- 1) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- 2) Plan for rehabilitation of monuments wherever necessary.

The current status of the protection / relocation works may please be presented for the review by the Sub-group.

**(h) DOWN STREAM ENVIRONMENT**

Considering that adverse effects manifest during raising the dam, Sub-group, during 39<sup>th</sup> meeting requested a plan and timely implementation of the needed safeguard during raising the SSP dam height to EL 110.64m. In compliance a copy of the plan was received and circulated to the members along with agenda papers of the 40<sup>th</sup> meeting. Members, however, desired more time to study the plan. Dam height has been raised to EL 110.64 mtr by the end of June 2004. A compliance report on the environment safeguard measures suggested by the Environment Sub-group during 40<sup>th</sup> meeting, may please be presented by the GoG.

Adequacy of the steps taken by the State Govts. towards compliance of the conditions / stipulations/ directions/ recommendations of the Sub-group may please be reviewed by the Sub-group.

**B Status of readiness on implementation of the environment safeguard measures commensurate with raise in the height of the dam to EL 121.92 m as desired by the Sub-group is presented below**

To facilitate a review of the readiness on implementation of the Environment Safeguard measures to consider requests of the GoG for raising the dam height beyond EL 110.64m is presented below:

		Requirements for pari-passu compliance	Gujarat	Maharashtra	Madhya Pradesh
Catchment Area Treatment	Physical	Treatment of catchment area for Phase-I	Completed	Completed	Completed
	Qualitative	Assessment of adequacy	Awaited	Awaited	Awaited
Felling of trees		Entire tree growth from the submergence area should be removed before commencement of impoundment	Report on removal of Coppice crop awaited.	Report awaited	Completed in forest area. Report on removal of Coppice crop in non forest area is awaited
Flora Fauna		As per directions of the Secretary, MoEF, GOI and also by the Sub-group.	Progress on development of Sanctuary : Satisfactory	Recommendations of the EIA studies not yet implemented.	Draft plan is yet to be finalised and implemented.
Carrying Capacity			Estimated for sanctuary being ensured through sanctuary development	Not estimated	Not estimated.
Fisheries Conservation Aspects			Draft plan available. Implementation progressing	Revised plan submitted	Revised plan awaited.
Downstream Environment		Detailed plan to be submitted	Awaited	Not applicable (N.A)	N.A.
Command Area Development		Submission of the plan and its implementation	Submission of the plan awaited	N.A.	N.A.
Health		Addl. Facilities as required must be provided. Monitoring reports should also be available. Data to be put up on the web site.	Awaited	Awaited	Awaited
Seismicity & Rim Stability		Collection and analysis of data should be a continuous process.	Upto date Progress Awaited		
Archaeology		Relocation / protection / excavation	Completed	N.A.	Awaited.

In view of the above, party-states are requested to provide detailed information towards compliances on pari-passu for a review by the sub-group.

**Item No. XLI-3(191): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES INDIRA SAGAR PROJECT :**

**A. CONSTRUCTION SCHEDULE:**

Indira Sagar Project (ISP) formerly known as Narmada Sagar Project has an installed capacity of 1000 MW and annual irrigation of 1.69 lacs ha. The project is very crucial due to regulated releases of 8.12 MAF of water from this project for SSP.

After getting necessary clearances the construction works were started in May, 1992 and the dam was targeted to be completed by June, 2000. However, due to various reasons the progress lagged behind. Subsequently, the work was handed over to Narmada Hydroelectric Development Corp. (NHDC), a Joint Venture of Govt., of Madhya Pradesh and National Hydroelectric Power Corporation. The targeted date of completion has been revised to May 2005. As per the available information the concreting was completed up to minimum 245.00m RL in the central overflow portion whereas non overflow side blocks were raised up to 266.25m RL. Accordingly the ISP would submerge an area of 91,000 ha. by December, 2004 and consequently would impact the land, Flora and fauna etc.

Month / year	Level in m	Submergence area in ha.	% in relation to FRL
Level attained by June 2004	245.13	28,600	31.43
December, 2004	MRL	91,000	100

**B) Current Status of Implementation of the Environmental safeguard measures for the Indira Sagar Project is presented below for a review by the Members**

**(a) CATCHMENT AREA TREATMENT (in ha)**

As per stipulations, considering the construction schedule, works in the entire Phase-I area should be completed by December 2004. The progress achieved upto July, 2004 is depicted below.

**1. PHASED CATCHMENT AREA TREATMENT (Area in Ha.)****Phase-I**

	Area in	Treated by NVDA	Covered under Comp Afforestation	Total area treated up	Balance Area proposed to be treated by State Forest Deptt /NVDA
Non-forest	49837*	49591	00	49591	246
Forestland	11515**	4273	4587	8860	1833
Total	62,975	53864	4587	58451	2079

\* Revised targets as per micro planning( including unworkable area of 2090 ha)  
Earlier targets were 51,927 ha

\*\* Revised targets as per micro planning (including unworkable area of 822 ha)  
Earlier targets were 11,048 ha

**Phase-II**

As per stipulations, schemes for treating the Phase-II area are required to be prepared & submitted to the funding agencies like RVP/ NAED Board of MOEF/Various other ongoing schemes of the central/ State Govts. The progress achieved is about **2.26%** as depicted below.

	Area in ha.	Treated by NVDA	Already treated under other schemes	Schemes submitted	Balance Area remained to be treated
Non forest	806720	20734	00	Not available	
Forest land	108430				
Total	915150	20734			894416

During the last meeting it was informed by the NVDA that progress is behind schedule due to non availability of the required funds of the order of 645.59 crores

Members may like to discuss & review.

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

Ministry of Environment and Forest vide letter No. 8-646-84-FC Dated the 7<sup>th</sup> Oct. 1987 permitted diversion of 41,111.97 hectares of forest land in Khandwa, Dewas and Hoshangabad districts for the Narmada Sagar Multipurpose Project. under Section 2 of the Forest (Conservation), Act, 1980, subject to the following key



conditions that :

1. Compensatory afforestation will be carried out over suitable degraded forest land double the diverted forest area in extent and in addition to the equivalent area in non-forest land. However subsequently the scheme for compensatory afforestation submitted vide letter Nos. F.D /AAA/ AO/3 dated 13.11.1987, as detailed below was approved by the MOEF. However additional compensatory afforestation over 150 ha. degraded forest was directed.
2. The areas will be surveyed, demarcated and declared protected forests and placed under the control of the Forest Department for compensatory afforestation at the cost of the project. Areas not found suitable will be substituted by suitable area.
3. Forest clearance was to be done only upto 4 M below FRL

District	Area in hectares diverted for ISP	CA target in Degraded Forest	CA target in non forest area	Total target in ha.
Khandwa	33,383	30,572	2,314	32886
Dewas	4,528	17,491	802	18293
Hoshangabad	3,678	22,739	2,842	25581
Sehore		-	1,247	1,247
Dhar		-	1,001	1,001
Khargone		-	1,937	1,937
Total	<b>41,589</b>	70,802	10,143	80,945
Revised Targets		70,952*	10,452**	

\* Targets revised due to additional works over 150 ha area as penalty.

\*\* Targets revised due to release of additional 308.47 ha of land.

### Progress of implementation

During 40<sup>th</sup> meeting it was pointed out that plantations raised as vegetative measures under CAT have been accounted for against the achievement of compensatory afforestation target also. Thus, the same plantation area has been shown against the achievement of CAT target as well as compensatory afforestation target. This was contrary to the directions of the Environment Sub-group. GoMP was requested to exclude the plantation areas covered under the CAT from the achievement of compensatory afforestation.

The progress reported by GoMP by the end of June 2004 was 78,643 ha (forest area = 68,596 & Non-forest area = 10,047 ha). However after deleting the targets covered under CAT programmes balance target works out as 6,943 ha. As per stipulations these areas were required to be planted up by Monsoon of 2004.

**(c) COMMAND AREA DEVELOPMENT AND DOWNSTREAM CONSIDERATION**

The project on completion will provide annual irrigation to 1.69 lakh ha. The Command area comprises Forest:10,055ha; Grasses and pastures:10,498ha; Cultivated land: 142,406ha; Culturable fallow : 8,116 ha; Barren:18,385 ha. As per direction of the Planning Commission, project proposals are required to include the command area development plan also. MoEF clearance of 1987 also required it. The forest clearance stipulated that tree planting should also be done on either side of canal road and foreshore of the reservoir and in the wasteland / vacant lands under the control of the Irrigation Department in the command area. The key conditions attached with the investment clearance were as follows.

- The State shall comply with the conditions as laid down In the O.M.No.3-87/80-IA dated 24.6.1987 and letter No.8/646/84-FC dated 7.10.1987 both issued by the Ministry of Environment and Forest while according the environmental clearance and the approval for diversion of forest lands for this project respectively for this project and ensure completion of Rehabilitation and Resettlement Plan in scheduled time with close monitoring as per requirements of Department of Environment and Forest.
- State will establish adequate network for ground water monitoring in the command within 2 years and the State should submit to Planning Commission the time frame for establishing such network with mile-stone achievements, duly vetted through Central Water Commission, for monitoring the same by Planning Commission
- State should draw up a detailed time schedule for completion within 5 years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area ( Not already submitted) of the total command of this project.
- The State should draw up an implementation schedule segment-wise for completion of canal network, in such a manner that a segment of the canal network, taken up from head reaches, is completed in all respect so as to make the irrigation water available, for the design potential of that segment upto the outlet in that particular segment;

The Government of Madhya Pradesh have submitted command area development plan, delineating the soil classifications and land irrigability in the Narmada Sagar Command Area showing the first three phases of irrigation development by area, the land irrigability map of the Narmada Sagar Command Area during 1986. Accordingly the implementation of the plan was to be taken up in three phases for completion by December-2007. The subgroup directed updating of this plan in line with the plans being developed for the SSP in Gujarat and Rajasthan.

1. The study on impact of Agro chemicals, runoff from fields on surface & ground water quality in the command area was assigned to J.L. Agricultural University, Jabalpur. Results may please be presented
2. However the progress on the canal system is very slow. Earth work has been completed only in the first 28 kms of the main canal and mostly completed in another 13.25km length. Work for most of the distributaries is yet to be started.

As informed during the 40<sup>th</sup> meeting a GIS based CAD plan was under preparation with the help of NIC, MAPCOST and Survey of India and experts from NCA. Preparation of a comprehensive command area development plan was entrusted to MITCON consultants of Pune at estimated cost of about Rs.40.00 lacs. A multi-disciplinary expert group was constituted by the GoMP to supervise and monitor the preparation of this plan. The consultant have already started the work which was likely to be completed by June 2005.

Members may like to review & discuss.

#### (d) **FLORA, FAUNA, & CARRYING CAPACITY**

The submergence of forestland will result in the creation of new and regenerated forest habitat, the establishment and improvement of wildlife sanctuaries, the greater availability of fresh water for irrigated forestry for wildlife. The MOEF conditions for clearance, as far as they related specifically to the Flora & Fauna, were essentially the same as brought under Sardar Sarovar Project.

The objective of the suggested studies was to assess the environmental impacts as a result of the Narmada Sagar Complex, consisting of the three dams: the Narmada Sagar, Maheshwar and Omkareshwar, to ensure minimal adverse effects on wildlife as a result of the project development works. Studies were entrusted to Wildlife Institute of India, Deheradun, Friends of Nature Society, Bhopal, Limnological studies to the Universities (Jabalpur, Ujjain & Bhopal). These institutes carried out studies with a view to address the above concerns and recommended certain mitigation measures which included the following.

1. Key aquatic vertebrates species like **otter** was proposed to be restored and translocated. It was suggested to explore the possibility of capturing and translocation of impacted otters of Narmada Sagar into identified localities of the vacant niches in central Indian rivers.



2. Besides, a species restoration plan for **aquatic reptile (turtle)** was also suggested within the submergence zone and also in other stretches of the river with rocky structure and sandy banks.
3. The restoration program for **muggar crocodile** as being practised in other districts of M.P. was also suggested.
4. The studies of certain aspects of fisheries and reservoir sciences have been included in the Limnological studies being conducted by the three Universities of the State.
5. Since the topography in the reservoir area consists of rolling hills, the higher peaks to remain above the water surface level and constitute islands in the reservoir. In addition to these small islands, two large islands will be formed to the north and south of the Narmada River just upstream of the Indira Sagar Dam. These islands were required to be protected. As per suggestions of the Sub-group NVDA had presented a plan for protection which was required to be implemented.

**A) National Park / Sanctuaries for ISP areas :**

It was suggested that the severity of the impact resulting from direct and indirect losses could be minimised through restoration of some of the aquatic vertebrates and delineation of a substantial area of the contiguity forest which has similar conservation values that are being lost in submergence and to elevate its status to a protected area – a combination of a national park and sanctuary. Three new protected areas were proposed to mitigate the losses. This included Narmada National Park, Suryanmaya Sanctuary and Omkareshwar Sanctuary, as per details given below. It was however informed during the 40<sup>th</sup> meeting that the issue for implementation of the recommendations was under consideration of the State Cabinet.

Name of the Sanctuary/Park	Area in ha.		Difference in area (ha)
	As per Will	As per State committee	
Omkareshwar National Park	47522	25082	- 22440
Suryamanya Sanctuary	16370	17400	+ 1030
Narmada(Mandhata) Sanctuary	11996	6672	- 5324
<b>Total Area</b>	<b>75888</b>	<b>49154</b>	<b>- 26734</b>

Govt. of M.P. vide their letter No. F5/58/83/10/3 dated 29.05.1990, formed a committee for suggesting the steps and drawing up of the plan for conservation & management of wildlife for SSP & ISP both. It was reported by the NVDA that, to

ensure that no villages are included inside the proposed area of National Park and Wildlife Sanctuaries, the areas recommended by the EIA report was reduced by about **35.23%**. i.e. instead of covering an area of **75888 ha** recommended by the EIA studies GoMP is willing to constitute protected area only for **49155 ha**. This may have adverse consequences on the conservation of Wildlife.

Members may like to discuss the resulting impacts and consider the issues on merit.

**B) Consideration for commercial fishing activities in the proposed sanctuaries / National Parks.**

During 40<sup>th</sup> meeting of the Environment Sub-group, GoMP requested the Sub-group to consider permitting Govt. of M.P. for fishing related activities like rights of development of fishery, entry, exploitation, transportation in the proposed protected area even after issuance of the notification. The request of the GoMP was based on the facts that once the areas were notified as Protected Area such activities would not be permissible because the areas to be submerged would legally remain forest land covered by the provisions of forest conservation act 1980. The issue was discussed and it was suggested that this proposal be first got examined by the High Level Expert Group on Conservation & Development on Fisheries constituted by the NCA on the advise of the Environment Sub-group for such purposes and simultaneously this proposal may also be submitted to the MoEF. Members requested more time to respond to the proposal and a copy of the proposal received to this effect was circulated as annexure to the Minutes for perusal of the members. The meeting of the expert group is scheduled during 8<sup>th</sup> of November, 2004. Progress may please be presented by the GoMP for a review by the members.

**C) Protection of the wildlife moving out from the submergence area : Status and manner of felling of trees from the submergence area.**

A plan for felling was also required, to ensure protection to wildlife. GoMP reported that felling was under progress in 300 compartments of forest areas, 407 Khasra from 24 villages besides private areas of 125 villages. It was further reported that by the end of June 2004 all trees in the private areas were felled where out of 25,872 trees from revenue areas 21,249 trees were already removed.

However in the forest areas out of 49,27,457 about 641702 nos. of trees were yet to felled. Environmental consequences of this large scale felling were documented to by the wildlife Institute of India in the EIA studies which called for implementation of mitigation measures, commensurate with progressive filling of the reservoir.

Considering the above, the Sub-group during 38<sup>th</sup> meeting held on 10.3.2003 requested GoMP to initiate the process immediately for implementation of the recommendations within five months period. However, implementation of the plan is yet awaited. Present position may be reviewed by the Sub-group.

#### **(e) SEISMICITY AND RIM STABILITY**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. The MOEF conditions for clearance, as far as they related specifically to the Seismicity and rim stability, were essentially the same as brought under Sardar Sarovar Project.

The Narmada Sagar reservoir has a gross capacity of 12,200 million cubic meters, or about 9.9 million acre-feet, by far the largest-capacity reservoir planned in the Narmada River basin. Therefore the issues of Seismicity and the potential for reservoir-induced seismicity (RIS) were required to be attended as per recommendation of the dam safety review panel, Central Water and Power Research Station, (CWPRS) Pune and Indian Meteorological department (IMD), which suggested:

To monitor seismicity during the pre and post-impoundment phases. Network of about five stations each be developed in the Narmada Sagar, Omkareshwar, and Maheshwar areas .

- To record the ground motion intensity and response of the dams for any significant earthquake in the vicinity, installation of three strong motion seismographs at each dam site.
- To record any significant ground motion that occurs during construction, one strong motion instrument near each dam site.

Accordingly, zone a network of 10 seismological observatories with sophisticated instruments was being established. It was proposed to monitor pre and post impoundment seismicity also at these seismic stations to help in assessing the adequacy of seismic parameters adopted for designs. The location of these seismic observatories was as under:

1. Namada Nagar	2. Omkareshwar (Kothi)	3. Maheshwar	4. Khandwa	5. Indore
6. Barwani	7. Bagli	8. Kannod	9. Hirapur	10. Chhanera

In addition, to monitor local activity in and around Pandhana, one unit at Pandhana in Khandwa has been established. The complete package of seismic digital and analog recorders and sensors have been procured and installed at 10 observatories station. Man power has been deployed for day-to-day operations, maintenance and watch and ward of seismic observatories of ISP on contract basis.

It was informed that data was being recorded at all the observatories except at Kannod and for data acquisition and analysis proposals from private agencies such as Indian agent of M.S. Sprengnether Instruments Inc., USA were being invited.

Considering that reservoir has been impounded up to an EL 245.13m, out come of the data analysis carried out by the identified institutions for the ISP regarding reservoir induced seismicity during progressive filling of the reservoir may please be presented.

Members may like to discuss and review.

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, specific requirements for the ISP contained in the environment clearance order of GOI were essentially the same as brought out separately under the Sardar Sarovar Project.

The Indira Sagar Project would create a 913 km<sup>2</sup> reservoir, a main canal of 332 km. and 1,820 km of distributaries. Surveys and investigation of the existing levels of health, information on specific diseases besides implementation of the planned measures in time were required in accordance with the order of clearance.

Three specific diseases namely Malaria, Schistosomiasis, and Filariasis were studied and diseases like leishmaniasis, scabies, etc., were investigated. The geographical reconnaissance study, to identify the potential breeding sites of malaria vector, was suggested. Other key suggestions included

1. Measures to control schistosomiasis should include physical, chemical, and biological means. The biological mitigation measures would include the use of predator species that would eat the secondary host snails.



2. Since the Anopheline mosquito vector has the potential to proliferate in the reservoir, the large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Some experimental resistance of adult mosquitoes to commonly used biocides was noted under laboratory conditions. Thus research to maintain effective biocides was to be continued on long term basis. Land leveling and land filling operations as well as appropriate vegetation clearing are being integrated. Control measures was to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites.

In pursuance the NVDA was required to update and implement the plan on health aspect for ISP. A copy of the plan was received from the NVDA. It covered the up-stream, dam site, command area and the rehabilitation sites of the Indira Sagar and Omkareshwar projects. The plan estimated to cost Rs.6.49 crores included provisions towards ISP for 30 bedded hospital at Punasa, 1 mobile unit, 29 Sub-Health Centers, 2 Public Health Centers besides strengthening of 6 existing health sub-centers. Provisions for IEC, control of Arthropods, provision of insecticides and surveillance were also incorporated.

Observations of the ICMR on the health plan identified gaps in plan. These were annexed with the minutes of the 40<sup>th</sup> meeting.

Status of compliance / implementation of the plan may please be presented, for perusal /observations and review by the members

#### **(g) ARCHAEOLOGY**

In addition the general obligations of the State under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out under the Sardar Sarovar Project

Investigations of the basin revealed that valley was rich in archaeological belongings. A survey of the 254 villages for identification of the archaeological monuments falling within the submergence area was carried out by the State Department of Archaeology and Museum, Bhopal. The current status of monuments is as below.

- 254 villages surveyed for identification of Archaeological monuments coming under submergence.
- 8 Nos. of monuments have been identified which require relocation/ protection.



- 153 statues have already been collected and preserved at Museum at Dewas, Hoshangabad and Khandwa.
- Shiv Mandir Dharikotla has been relocated to Sarlaya R&R site
- Archaeological Survey of India has also resurveyed 167 villages for identification of the monuments of significance.
- Archaeological Survey of India have prepared a plan for protection of monuments coming under the submergence of Narmada Sagar Complex area. According to this plan, the well situated in the midst of north bastion of Joga Fort, a centrally protected monument, will be fully submerged at FRL + 262.10 M. However, this will remain submerged for 2-3 months during monsoon when reservoir might be at FRL. As far as backwater effect is concerned, the temporary rise due to backwater will be about 0.60 M near well, above HFL. Archaeological Survey of India had prepared an estimate of Rs.1.50 crores for construction of a wall to protect the in-take well. It was decided that NVDA will carry out the work through NHDC under supervision / guidance of ASI.

During 40<sup>th</sup> meeting it was informed that NHDC has prepared an estimates of Rs.25.00 lacs for construction protection wall which has been approved by the Archaeological Survey of India and that NHDC was directed to carry out the work latest by Sept. 2004.

Further progress on re-survey being carried out by the ASI, protection of other identified monuments and progress on protection of intake well of the Joga Fort may please be presented for a review by the members.

#### **(h) ANTHROPOLOGY**

The Narmada Valley can be divided into three physiographic units (1) Western Vindhyas (2) Narmada through West and South and (3) Western Satpuras. Some Indologists place the Narmada-Chambal civilisation of Malwa as a contemporary of Indus civilisation. Navada Toli is a site contemporary to Harappa where evidence of early farming villages were discovered. Findings of a hominoid skull from Hathnora indicated the possibilities of the existence of human bio-cultural remains within the basin. Excavation of the early historic mound in village Khedinama in Hoshangabad district was completed earlier during 1993-94. Ancient tools and artifacts were found. The entire area was scanned by the Anthropological Survey of India under Narmada Salvage Plan and some ancient tools have been found. NVDA has also planned to establish a Center on Religious and Cultural heritage of the Narmada Basin, initial discussions were held with the experts by the NVDA during the meeting convened for the purpose on 11<sup>th</sup> July 2003. Further progress may please be presented.

After detailed studies NVDA prepared a plan for excavation of five sites in District Dewas, Khandwa. As per the information received from the NVDA excavation works on all the five identified mounds was completed by the State Archaeological Department after taking permission from the Archaeological Survey of India.

A report on findings of the excavations may please be presented for a review by the Members.

**Item No. XLI - 4 (192) :SHARAING THE COST OF THE TREATEMENT OF FREELY DRAINING CRITICALLY ERODED CATCHMENT AREA**

Catchment area treatment was one of the condition stipulated by the Ministry of Environment and Forest, Government of India while according clearance to SSP. As per NWDT Award, the cost of treatment of degraded areas in the catchment of the project was not charged to the project. Subsequently the Committee of Union Secretaries decided on 3.7.1992 [Annex-XLI(3)] that only the treatment of critically degraded areas which drain directly in the reservoir **(Phase-I)** should be charged to the Project. The cost of treating the freely or indirectly draining area **(Phase-II)** is not to be charged to the project.

The cost of the treatment of directly draining critically degraded catchment area i.e. Phase-I is to be charged to the project and shared by the party states. The proportion in which this cost is to be shared is the issue on which there are divergent views. Discussions on this issue have been held in various meetings of NCA and RCNCA since April, 1989. The matter has been recently discussed in the 12<sup>th</sup> RCNCA meeting held on 9.9.2004 wherein the Govt. of MP desired to discuss the cost sharing aspect of the CAT of phase-II area also as it has direct bearing on the cost sharing aspect of the CAT of phase-I according to them.

Targets and achievements of the treatment of phase-II CAT of SSP is as below :

Phase-II Plan	Area	Achievements
Govt., of Gujarat	657 ha	Completed
Govt., of Maharashtra	77,568 ha	20,861 ha
Govt., of Madhya Pradesh	3,18,118 ha	35,312 ha

It was observed during the 35th ESG meeting that due to decentralization of the funding components of the watershed management schemes and placement of funds at the disposal of the respective State Govts, needed steps should be taken by the Sates for continued support to the soil and moisture conservation works as envisaged. It was, however, informed that the progress on treatment of Phase-II areas of catchment was very less due to inadequate financial commitment

received for treatment of the Phase-II areas. State Govt., therefore, requested from the sub-group for obtaining funds for treatment of the Phase-II works.

GOMP has desired that the cost of phase-I and phase-II CAT should be distinguished from one another and should be charged to the project and among the party states in the proportion to be decided by the RCNCA. Also, GOMP has proposed that Ministry of Agriculture, GOI should launch a Central scheme of soil and moisture conservation in the entire CAT with 100% assistance. That the question of sharing the cost of phase-II to CAT by the party states should remain an issue. Funding under such scheme should be made directly to NVK, not through the Agriculture Department of the State Govt. Otherwise the GOMP should be allowed to go ahead with the quantum of funding received from GOI without any delay to the time frame envisaged in the action plan for which MOEF is required to issue its clearance orders.

GOMP has requested that the above provision should apply to the sharing of the cost of phase-I & phase-II CAT of SSP and ISP both.

The RCNCA in its 12<sup>th</sup> meeting held on 9.9.2004 has desired that the proposal of GOMP should be discussed by the Environment Sub-group and the NCA and the decision should be placed before RCNCA for its consideration.

The members may like to discuss and decide.

**Item No. XLI – 5 (193): REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

**1. Phase-I Establishment of Silt Monitoring Stations.**

In pursuance to the recommendations of the Environment Sub-group for establishing silt monitoring stations to assess the efficacy of the treatment works Sardar Sarovar Narmada Nigam Ltd., decided to entrust this work to Central Soil & Water Conservation Research & Training Institute, Vasad. Studies carried out by the Space Application Research Centre, Ahmedabad through satellite imagery for the period 1985-86/ 1994/ showed that there was considerable improvement in the conditions of the catchment. Data pertaining to 2002 was got analysed and made available by the SSNNL. During last meeting it was directed that dedicated focused monitoring for assessment of the CAT works is a continuous process and arrangements made for the same should be continued.

- Report on silt monitoring works entrusted to CSR &TI was awaited from Govt. of Gujarat.
- Report on periodical updating of the focused studies carried out for the sub-watersheds already treated, through FSI was awaited from Govt. of Maharashtra.
- GoMP was taking steps for entrusting the studies to CSR &TI. Progress may please be reported by the GoMP.

**B. MONITORING WORKS IN MAHARASHTRA**

- 1. Agency for Inter Departmental Coordination for effective implementation of the plans in time and funding of the works on implementation of action plans for mitigation of adverse impacts on environment.**

In pursuance to the recommendations of the Environment Sub-group during 40<sup>th</sup> meeting a series of steps were taken by the Govt. of Maharashtra and Environmental Cell for strengthening Inter Departmental Coordination has been formed.



Similarly steps have also been taken for release of funds for implementation of environment safeguard measures like implementation of plan on health, plan on fisheries, plan on flora & fauna etc.

A copy of the notification & actual release of fund may please be presented by Govt. of Maharashtra.

**C. SARDAR SAROVAR PROJECT : PUBLICATIONS / SEMINARS  
ENVIRONMENT MANAGEMENT**

During earlier meetings it was desired that good works being done by the Project Authorities are to be published. Publication brought out by the project authorities were presented and It was informed earlier that the thrust areas have been identified for publishing success stories. Further progress may please be presented.

**D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND  
IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

In order to frame yard sticks on the cost estimates of the water resources Projects, the Chairman of the Sub-group during earlier meeting desired compilation of the estimates and expenditure incurred on survey, studies and implementation of the suggested safeguard measures for the SSP / ISP. Updating of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level is requested from the Govts. of Gujarat, Madhya Pradesh and Maharashtra.

**Item No. XLI-6(194) :** Any other item

**Date and venue of the next meeting**

# ANNEXURES



**ANNEX – XLI –(1)**

To

Dr. Pawan Kumar  
Director(Environment)  
Narmada Control Authority  
116-BG, Scheme No. 74-C  
Vijay Nagar, INDORE 452 010 MP

Dear Dr. Pawan Kumar,

I received the Minutes of the 40th Meeting of Env. Sub Group of NCA held on 28/6/04.  
My comments follow:

Page 16 C. Study of the Implementation of the environment safeguard measures corresponding to 110.64m height of SSP.

"Prof. S. Ramaseshan .....to the extent possible."

This does not represent either my request or the decision. I had never asked for copies of plans and reports which formed part of the discussions. It may be modified as follows: Prof. S. Ramaseshan observed that details, generally presented (as Annexures) in the Agenda Notes of earlier Meetings of the Sub Group were helpful in understanding the technical implications of the environmental aspects. Unfortunately they are missing in the Agenda Notes recently. Because of their usefulness, Prof. Ramaseshan suggested the continuation of the earlier practice. In particular he mentioned that in an earlier meeting, he could point out an error in the backwater curve only because these details were ~~ade~~ available in the Agenda Notes. The Chairman summed up the view of a number of (official) members that the Agenda Notes are adequate for their requirements. The Chairman stated that, while the new practice may continue, if and when any member requested for additional information, it be made available to him before the meeting by the Secretariat. The words "to the extent possible" is to be deleted as the information is available to the Secretariat and is needed by the member to meaningfully participate in the deliberations of the Sub Group. With best regards,

Yours sincerely,

Ramaseshan

**Government of Madhya Pradesh  
Narmada Valley Development Department  
Mantralaya, Bhopal**

No. /NVDD/E&F/2004/

Bhopal, dated

To,  
Secretary,  
Government of Gujarat,  
Forest Department,  
Gandhi Nagar (Gujarat)

**Subject:- Constitution of Wildlife Sanctuaries under Sardar Sarovar Project.**

Govt. of India, Ministry of Environment and Forest, vide its memo no. 3-87/80-IA dated 8<sup>th</sup> Sept. 1987, has accorded approval for diversion of 133385.45 hectares (6488.54 ha. in Maharashtra, 4165.91 ha. in Gujarat and 2731.00 ha in Madhya Pradesh) of forest land for Sardar Sarovar Project. A number of conditions were stipulated in the above approval. Later on GoI, MoEF, vide its even numbered memo dated 6<sup>th</sup> Jan. 1989 added the following condition no. (xii) :-

*"Condition (xii) : For conservation and management of Wildlife, a committee will be constituted by the State Govt. by 31<sup>st</sup> January, 1989 which will include a representative from the Govt. of India. The Committee will suggest the necessary steps to be taken and draw up a plan which will be implemented at the cost of the Project."*

2. Consequently GoMP, Forest Department, vide its memo No.F-5/58/83/10/3 dated 29-5-1990 revised its previous order dated 8-1-1988 regarding constitution of "Committee for Conservation and Management of Wildlife affected due to submergence of Narmada Sagar" and renamed the Committee as "Committee for Conservation and Management of Wildlife affected due to submergence of Narmada Sagar and Sardar Sarovar Project".
3. NVDA entrusted "Floral, Faunal & Carrying Capacity Studies of SSP" to State Forest Research Institute, Jabalpur. The final study report was placed before the Wildlife Committee for its consideration. The Wildlife Committee, during its meeting held on 14<sup>th</sup> Nov. 2002 under the Chairmanship of Principal Chief Conservator of Forests (Wild Life), Madhya Pradesh, Bhopal, recommended the constitution of two Wildlife Sanctuaries viz. Mathwad Wildlife Sanctuary and Katthiwada Wildlife Sanctuary in Madhya Pradesh. A copy of the minutes of the above meeting is enclosed herewith as Annexure-1.
4. The detailed estimates of various improvement works proposed to be carried out in these two Wildlife Sanctuaries have been recommended by Wild Life Committee in its meeting dated 16/12/2003 and forwarded by Principal Chief Conservator of Forests (Wild Life), Madhya Pradesh, Bhopal, vide his U.O. Note dated 30.12.2002. A copy of this note is enclosed herewith as Annexure-2.

5. Government of Madhya Pradesh, Narmada Valley Development Department, vide its memo no. /NVDA/E&F/2004/1123 dated 25.06.2004, requested Secretary, Govt. MoEF and Chairman, Environment Sub-group of Narmada Control Authority to include Ex-Agenda item (no.2) regarding permission to constitute two Wildlife Sanctuaries under Sardar Sarovar Project in the Agenda of the 40<sup>th</sup> meeting of Environment Sub-group scheduled on 28<sup>th</sup> Jun., 2004. The above Ex-Agenda was included in the Agenda and discussed during the meeting held on 28<sup>th</sup> Jun., 2004. A copy of above mentioned memo dated 25.06.2004 is enclosed herewith as Annexure-3.

It is hereby requested that the above issue of constitution of two Wildlife Sanctuaries viz. Mathwad Wildlife Sanctuary and Katthiwada Wildlife Sanctuary in Madhya Pradesh may be examine by Govt. of Gujarat and its comments may be made available to GoMP.

Encl.: As above.

S. P. -  
(Pradip Bhargava)  
Principal Secretary,  
Government of Madhya Pradesh,  
Narmada Valley Development Department,  
Bhopal

/Endt. No. /NVDD/E&F/2004/ 1166

Bhopal, dated 7/7/04

Copy to : Member (Environment & Rehabilitation), Narmada Control Authority and Member Secretary, Environment Sub-group of NCA, Indore for information and necessary action. A set of above mentioned annexures are enclosed herewith.

Encl.: As above.

Principal Secretary,  
Government of Madhya Pradesh,  
Narmada Valley Development Department,  
Bhopal

**Government of Madhya Pradesh**  
**Narmada Valley Development Department,**  
**Mantralaya, Bhopal**

No. NVDD/2004/23

Bhopal, dated 25/6/04

To,

Secretary,  
 Govt. of India,  
 Ministry of Environment & Forests, and  
 Chairman,  
 Environment Sub-group of Narmada Control Authority,  
 Parganah Bhawan, Block-B,  
 C.G.D. Campus, Lodi Road,  
 New Delhi.

Sub. : Request for inclusion of two ex-agenda items in the agenda of the meeting of Environment Sub-group to be held on 28<sup>th</sup> June, 2004.

Kindly find enclosed herein following two ex-agenda items proposed to be included in the agenda of the meeting of Environment Sub-group to be held on 28<sup>th</sup> June, 2004 :-

Ex. Agenda Item No. 1: Permission to continue fishing activities in the Indira Sagar Project Reservoir and other Reservoirs involving diversion of forest land duly sanctioned by Govt. under provisions of FCA, 1980 and in the water bodies located within the boundaries of proposed protected areas.

Ex. Agenda Item No. 2: Permission to constitute two Wild Life Sanctuaries under Sardar Sarovar Project.

It is requested that these two ex-agenda items may kindly be included in the agenda and discussed in the meeting.

Encl. : As above.

(Pradip Bhargava)  
 Principal Secretary,

Narmada Valley Development Department  
 Mantralaya, Bhopal

Bhopal, dated 25/6/04

Encl. No. NVDD/2004/23

✓ Copy to : Member (Environment & Rehabilitation), Narmada Control Authority and Member Secretary, Environment Sub-group of NCA, Indore for information and necessary action. As above mentioned Ex-agenda items is enclosed herein.

Encl. : As above.

Principal Secretary,  
 Narmada Valley Development Department  
 Mantralaya, Bhopal

**ANNEX – XLI –(3)**

No. 15/94/90-PP  
Ministry of Water Resources  
Govt. of India  
\*\*\*

Shram Shakti Bhawan,  
Rafi Marg, New Delhi,  
The 8<sup>th</sup> July, 1992.

To

**The Chief Secretary  
Government of Rajasthan/MP/Maharashtra/Gujarat,  
Jaipur, Bhopal, Bombay, Gandhinagar.**

**Sub: Catchment Area Treatment of Reservoirs.**

Sir,

Committee of Secretaries in their meeting held on 3.7.92 at 4.45 P.M. in the Committee Room of Cabinet Secretariat have discussed catchment area treatment of reservoirs and decided as under:

- a) In view of the differences in the geographical situations around the different reservoirs, it would be difficult to provide for any standardized package for treatment of the watershed around the reservoir rim for improving their carrying capacity. The proposals will have to be looked into on a case to case basis and settled in consultation with the Ministry of Environment & Forests at the time of clearance of the project. But the objective would be to keep this treatment to a reasonable extent and not to unduly burden the project with general land improvement activities as such.
- b) The Planning Commission in consultation with the Ministry of Agriculture and the Ministry of Environment & Forests should separately review the provisions required for improving the degraded lands in the different basins. These provisions and the programmes thereof need not be tagged with any specific project in reservoir basin as such.

contd.....



2 //

c) The work envisaged on account of the immediate and direct adverse impact of the project during the construction phase along with the work in the catch draining sub watershed for improving the carrying capacity of the degraded/ highly degraded lands along the river should be carried out pari passu with the construction programme of the project and provided for in the cost estimates of the project.

You are requested to take further necessary action in the light of the above decision of the Environmental Action Plan with regard to catchment area treatment of the river and other projects in your State.

Yours faithfully,  
Sd/  
( B.S. AHUJA )  
Joint Commissioner

1. Mr. B.S. AHUJA, Joint Commissioner, SCAC,  
2. Mr. B.S. AHUJA, Joint Commissioner, SCAC,  
3. Mr. B.S. AHUJA, Joint Commissioner, SCAC,  
4. Mr. B.S. AHUJA, Joint Commissioner, SCAC.

2) The water conservation aspect of the immediate and direct construction phase along with the watershed for improving the highly degraded lands along the construction with the construction cost estimates of the

...take further necessary action in the light of the above decision in respect of Environmental Action Plan with regard to catchment area treatment of Sardar Sarovar and other projects in your State.

Yours faithfully,  
Sd/  
( B.S. AHUJA )  
Joint Commissioner

(PP)

Copy to :

- 1) Member (WP), CWC
- 2) Vice Chairman / Secretary, SSCAC.
- 3) Vice Chairman, SSNNL.
- 4) Executive Member, NCA.

केवल सरकारी प्रयोग के लिए

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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**इकतालीसवी बैठक का कार्यवृत्त**  
**Minutes of the 41<sup>st</sup> Meeting**

6 जनवरी, 2005 को

पर्यावरण भवन, नई दिल्ली में हुई

Held at Paryavaran Bhawan, New Delhi on 6<sup>th</sup> January, 2005

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

इन्दौर

Indore



**MINUTES OF THE 41<sup>ST</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NCA HELD ON 6<sup>TH</sup> JANUARY, 2005  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

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**MINUTES OF THE 41<sup>ST</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NCA HELD ON 6<sup>th</sup> JANUARY, 2005  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

The 41<sup>ST</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held at Paryavaran Bhawan, CGO Complex, New Delhi, under the Chairmanship of Dr. Prodipto Ghosh, Secretary, Ministry of Environment & Forests (MoEF), Govt. of India. The Chairman welcomed all the Members and Invitees to the meeting and discussions on the agenda items were taken up thereafter.

List of participants is enclosed at **Annex-XLI-Min-(1)**.

**Item No.XLI-1(189) : CONFIRMATION OF THE MINUTES OF THE 40<sup>TH</sup> MEETING OF THE SUB-GROUP.**

The Sub-Group considered and accepted the correction in the minutes on Page-16 Para-1 brought out in the agenda as requested by Prof. S.Ramaseshan.

The Managing Director, SSNNL referred to his letter dated 23<sup>rd</sup> September 2004 [copy placed at **Annex-XLI-Min-(2)**], seeking corrections in the minutes under item No.XL-2(185)/(B)(C) on page-8 in the last para. He explained that it was not technically possible to let down the water back into the river, after generation of power, as the maximum discharge capacity of the Godbole gates was limited to about 7000 cusecs only whereas the discharge from the CHPH (all the five units) after generation of power was of the order of 25000 cusecs. The Chairman however stated that the minutes as recorded reflect as to what was stated during the last meeting but in view of the submission of the Govt. of Gujarat as brought above, the issue could be discussed. The Vice Chairman, NVDA expressed the opinion that the corrections suggested by Managing Director, SSNNL, being factual could be considered and accepted.

The Sub-Group considered the request and agreed for partial amendments to the written text and deleting the expressions "... and till then this water must be released into the Narmada river system" and the last para was modified to read as below.

"The Chairman summed up the discussions by saying that water might be drawn from the SSP for generation of power if so envisaged but after generation of power it should not be utilized for irrigation in the SSP command until approved plan to mitigate negative impact was implemented".

The minutes of the 40<sup>th</sup> meeting were approved with the above amendments.

Item No.XL-2(190)

**REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES.****A. CONSTRUCTION SCHEDULE:**

The Chairman opened the discussions for assessment of the Environment Safeguard Measures for raising the dam height as brought out in the agenda papers. Prof. Ramaseshan stated that as per decisions of the Sub-Group, status of compliance on implementation of the environment safeguard measures is required to be assessed with respect to the submergence being caused by the back water levels and not with respect to the pool level submergence.

The Vice Chairman, NVDA informed the Sub-group that status of compliance reported by the states was with respect to back water profile only and assured that this is being strictly followed for rehabilitation as well as for the environment safeguard measures.

**Current Status of Implementation of the Environmental Safeguard Measures.****(a) CATCHMENT AREA TREATMENT**

Prof. S. Ramaseshan stated that the areas of the sub-watersheds where the catchment area treatment works could not be taken up i.e. area not available for treatment as mentioned in the agenda should be shown distinctly along with reasons, for the information of the members. The Vice Chairman, NVDA pointed out that the detailed information on such areas was already submitted to the Sub-Group earlier and could be referred to.

The Director, MOEF pointed out that though the progress of physical works completed in the field was satisfactory, the assessment on efficacy of the treatment works is required to be made so as to initiate further requisite measures, if so required.

**Govt. of Gujarat:**

The Managing Director, SSNNL informed that the Govt. of Gujarat had already submitted detailed reports on progress of qualitative assessment of the physical works for the forest areas during 1998 and thereafter during 2001. He further informed that for the non forest areas work as per suggestions of the Environment Sub-group was entrusted to Valsad Centre of the Central Soil Research & Training Institute, Dehradun.

One interim report was submitted and the work is making good progress. Four silt monitoring stations have been established and data collection has already been started and an interim report has been submitted by the agency. He further informed that these works are of continuous nature and would need monitoring over a period of time. It was assured by the GOG that a comprehensive report would be submitted by the end of January, 2005.

#### **Govt. of Maharashtra**

The Principal Secretary, (Energy & Environment), GOM informed that Forest Survey of India, Nagpur Centre is carrying out sub watershed wise assessment of efficacy of the catchment treatment works in the forest areas. However for the agricultural areas, Central Soil Research & Training Institute has been asked to conduct such studies.

#### **Govt. of Madhya Pradesh**

The Vice Chairman, NVDA informed that Forest Survey of India is already carrying out periodical assessment of the forest cover for the entire country including that of the Madhya Pradesh. Similarly Central Water Commission was also monitoring the silt load in the river and that this should suffice.

Prof. Ramaseshan mentioned that the areas treated required dedicated focus monitoring as per the decisions of the 40<sup>th</sup> meeting of the Sub-Group. He further stated that the data received from Central Water Commission needs to be analysed with respect to the catchment area treatment locations.

The Chairman summing up the discussions stated that compliance on qualitative assessment in all the States needed to be expedited and directed that, the assessment of the forest cover for the areas treated should be analysed with the help of satellite imageries and the report on assessment for both forest and non forest areas should be placed before the Sub-Group by the party States.

#### **(b) COMPENSATORY AFFORESTATION**

The Director (Environment), NCA informed that works on plantations in the forest as well as non forest areas was completed earlier as reported to the Sub-Group and the progress achieved by the State of Gujarat, Maharashtra and Madhya Pradesh was satisfactory as per the progress report submitted. The Sub-Group however desired to

know the status of transfer of planted non forest areas to the regular territorial divisions and declared as forest and desired regular monitoring to know the rate of survival, composition of species at least till such time these areas were handed over to the regular forest department for further upkeep and maintenance.

In response to a query from the Chairman, it was explained that plantations are maintained with replacement of casualties and maintenance along with watch and ward and being carried out till such time these are handed over to the regular territorial divisions and these are at the cost of the project. This period varied between 5 to 10 years.

The Chairman directed that the areas where survival rate is poor should be supplemented with casualty replacements and a report on composition, survival count etc should be presented before the Sub-Group along with the information on the areas which were already transferred. He suggested that a report, on the plantations carried out during 1989-90 must have been established by now and should be presented to the Sub-Group.

**(c) COMMAND AREA DEVELOPMENT**

**Command area in Gujarat**

The Director (Environment), NCA mentioned that the decision of the Environment Sub-Group and the conditions contained in the order of clearance required pari-passu completion of the plans and their implementation commensurate with progressive irrigation. As informed to the Sub-Group earlier about 39,000 ha of area was irrigated last year and there is a definite demand for irrigation in the Phase-I command from the waters of the Sardar Sarovar Project. In order to ensure that ill effects of the irrigation do not cause environmental degradation, the measures recommended by the EIA studies for safeguarding the environment are to be implemented by the Govt. of Gujarat along with the development of irrigation in a progressive manner. If farmers are allowed to draw water as per their requirement without making use of the ground water though planned, 9 MAF water allocated to Gujarat will be insufficient to irrigate 3.4 million hectare of the anticipated gross command.

The Joint Director, Botanical Survey of India stated that to reduce the stress on the natural vegetation, the command area development was expected to include schemes for plantations not only on the canal banks but also on all available vacant

land besides agro forestry and establishment of botanical gardens for conservation of flora of the region.

Prof. Ramaseshan pointed out that laying out the drains simultaneous to construction of canal is essential and one should not wait until water logging raises its head. There is a need to monitor the water quality of the surface/ground water, rise/decline in the water table specially in view of the salinity and the prevailing climatic conditions. This problem may be more serious in certain tracks which are not favourable for irrigation & coastal areas. He suggested that farmers themselves are unlikely to pump out the water specially when good quality Narmada water was available and resources for sinking tube wells are scarce and uncertain. It was the commitment of the Govt. of Gujarat that water would be supplied with low delta and on volumetric basis to prevent negative impacts of irrigation. Govt. of Gujarat therefore is required to provide financial and institutional support through well defined policy for ensuring consumptive use and also to assist the farmers to construct field drains which may ultimately emptying into drains along with the minors and sub minors.

Prof. R.K.Katti emphasized the need for monitoring water quality both for the surface as well as ground water and ensuring of the conjunctive use. He stated that the land was in equilibrium for a long time and irrigation would shift this equilibrium. There was, therefore, a need for a close monitoring of the above activities.

The Director General, Indian Council of Agriculture Research stated that despite certain measures taken up in developing the command of Indira Gandhi canal, serious problems of water logging was observed. He suggested that identified areas could be tacked by mixing gypsum to reduce salinity.

The Managing Director, SSNNL informed the Sub-group that there was no organised irrigation by the Govt. of Gujarat in any areas of either Phase-I or Phase-II as yet, however some limited irrigation was being resorted to by the farmers through pumping from the canal. As the water table was much below, the problems of water logging are not expected in near future. It was further pointed out by him that drainage channels are being constructed simultaneous to construction of canal and that the Govt. of Gujarat could only educate the farmers on the benefits of consumptive use but cannot compel them. Plantations on the canal bank have been taken up and there was a substantial progress. He stated that incremental facilities on health aspects would also

be put in place in the areas under consideration by March,2005. He further informed that detailed plan for Phase-I as well as Phase-II was already made available to the NCA both in physical as well as electronic form which has also been circulated amongst the members. The comments received for Phase-I plan have also been attended to and the comments on Phase-II plan are yet awaited.

The Chairman stated that it was essential to develop the area before commencement of the irrigation to prevent environmental degradation. He stated that in addition to the above there was a need for fixing tariff for irrigation, appraisal planning, avoiding risk of water logging, environmental considerations related to flora and fauna. He further stated that if more water than what could be absorbed is allowed to be drawn it will have serious implications and therefore are required to be managed and monitored on regular basis. He suggested that this could be supplemented by properly educating the farmers and the societies through educational programmes by the party States.

#### **Command area in Rajasthan**

Shri B.G. Varghese drew the attention of the members towards non availability of the information regarding CAD plans for the areas in Rajasthan. The representative of Rajasthan mentioned that the areas to be brought under the command of Narmada waters in Rajasthan has been increased from 75,000 ha to about 2.3 million ha using modern techniques. The representative of the NCA informed that EIA studies for the increased command area were conducted by the WAPCOS on the TOR approved by the Sub-Group. The report suggested alternatives through modified technologies to irrigate 2.3 Million ha and the revised plan was circulated to the members and their comments received in the NCA secretariat have been forwarded to the GOR.

On a request from Prof Ramaseshan that the points raised by him should also be attended to, it was clarified by the representative of NCA that the replies received from the GOR were inadequate and therefore GOR have been requested to submit detailed plan on the lines as submitted by Gujarat which is awaited.

The Chairman directed that Govt. of Rajasthan should examine the technological options and should choose appropriate approved technology for mitigating the negative impacts on environment and report back during the next meeting of the Sub-Group.



**(d) Flora, Fauna and Carrying Capacity****Govt. of Maharashtra**

The representative of GOM informed that there was substantial progress on felling of trees but the planned measures for the environmental safeguard could not be taken up actively mainly due to constraint of funds. Director (Environment), NCA informed that implementing Department / Agencies of the GOM when pursued for early implementation have been demanding funds from NCA, even though the cost of survey & implementation of Environment Safeguard Measures has to be met by the States as their obligation for the project. The non-realisation of the same is the main cause for delay in implementation of the Environment Safeguard Measures for the areas in Maharashtra.

The Principal Secretary, Energy & Environment, Govt. of Maharashtra stated that he has been reviewing the progress at his level vigorously and the representative of NCA has been associated with these reviews and as such NCA is aware of the bottlenecks in this regard. The Sub-Group has directed for formation of a Environment Cell for ensuring dedicated monitoring at the state level but due to procedural delays and lack of appreciation of the urgent need towards release of funds, it has not been possible to start the work as brought out above. He however assured that he would apprise the Chief Secretary on the concerns raised here. He stated that the felling of trees upto EL 110m was completed except for 27 ha in village Bamni. He also assured that the tree felling between 110 to 121.92m RL would be completed by March, 2005.

The Chairman stated that availability of the funds for the project should not be an issue for a premier state like Maharashtra but its allocation for the environmental works is required to be addressed on priority. After some discussions, it was decided that a letter addressed to Chief Secretary of Govt. of Maharashtra for resolving the financial bottlenecks towards timely implementation of the environment safeguard measures could be written by Chairman of the Sub-Group. The Chairman mentioned that he shall discuss these issues with the Govt. of Maharashtra during his visit to the State also.

**Govt. of Madhya Pradesh**

The Director (Environment), NCA informed that the conditions/ clearance issued by MOEF required implementation of the plan for protective/ameliorate/restorative measures for protection of flora and fauna pari-passu with submergence. Presently

though submergence has already commenced measures to protect environment in accordance with the plans received are not yet complete.

Prof. V.B. Mathur pointed out that as per decision of the last meeting of the Environment Sub-group, a detailed EIA report was required which is not yet available and accordingly further discussions on the subject would not be meaningful.

The Vice Chairman, NVDA stated that proposal for establishment of sanctuaries and sharing the cost thereof was placed before the Sub-group during its last meeting. Members needed some more time to study the proposal. Details of the proposal have been sent to the NCA secretariat vide NVDA's letter dated 1.1.2005. He stated that Rs.3.14 crores has been given to State Forest Department for implementation of the social forestry plan.

**(e) Seismicity & Rim stability**

Progress presented was noted.

**(f) Health Aspects**

**Govt. of Gujarat**

The Commissioner (Fisheries), GOG informed that there was substantial progress on health aspects and the recommendations of the expert committee on health has been complied with.

**Govt. of Madhya Pradesh**

The Vice Chairman, NVDA stated that there was substantial progress, after the last reporting. A health cell with full computerized information system has been established in the NVDA for analysing the data and for suggesting remedial measures. The control of malaria is being attended to by the state department. Malaria Research Center is also carrying out studies in the impacted areas with the help of regular field visits. The State government was taking care of biological waste

**Govt. of Maharashtra**

The Principal Secretary, Energy & Environment, Govt. of Maharashtra stated that epidemiological surveillance studies for Phase-II areas were entrusted to Government Medical College, Dhule and a final report is expected by March, 2005. For incremental health facilities, a revised plan has been submitted and funds are also released and all activities in this regard would be completed by March, 2005.

The Director (Environment), NCA informed that the progress on implementation of the environment safeguard measures was received only a few days back and is under scrutiny. Preliminary observations however reveal that the progress reports sent is not in response to the action plan submitted instead appears to be cover only the general activities of the health department.

**(g) Archaeology & Anthropology**

**Govt. of Madhya Pradesh**

The Vice Chairman, NVDA stated that no monument shall be impacted by raising the dam height to EL 121.92m, however two Shiva temples at Roligaon and Chhoti Khasrawad shall be impacted by the backwater levels of the Sardar Sarovar Project. Relocation of temple at Roligaon has been completed whereas work related to relocation of other temple at Chhoti Khasrawad is being opposed by the local villagers. The issue shall be settled soon. He further stated that no mound shall be impacted.

**(h) Downstream Environment**

The M.D, SSNNL stated that the reports submitted by HR Wallingford have been accepted by the Govt. of Gujarat for management of downstream areas and the recommendation made therein shall be followed for implementation.

Prof. Ramaseshan stated that a comprehensive plan for management of downstream environment was not yet available. The study report of the HR Wallingford states that downstream management would depend upon a number of studies which were under progress at the time the report was submitted. A draft plan which was circulated and on which observations were made by him is not yet finalised. He pointed out that HR Wallingford in their studies of 1995 have brought out a series of actions required to be taken during pre and post impoundment phases of Sardar Sarovar Project.

These measures included

- ▶ Provisions for complimentary flows for mitigating pollutions in the downstream, restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone,

- ▶ Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality including physical, chemical and biological parameters,
- ▶ Developing of mathematical modeling for prediction of likely impacts of different operational scenarios for mitigation, studies on ecology and resources for the downstream environment, narrowing of river channel,
- ▶ Legal agreement between the party states for regulated releases to ensure that project works as planned.

He further pointed out that the assumptions that the water received in the downstream through the regenerated flows coupled with discharges from the industries located downstream shall take care of the needs is erroneous considering that such flows would be loaded with pollutants like pesticides, insecticides, municipal and industrial sewage. He stated that such releases downstream may also have to be diluted for keeping the surface as well as ground water in good condition. He stated that reports on implementation of these measures was awaited.

The representative of NCA pointed out that Narmada Water Dispute Tribunal Award, 1979 has not quantified any water for requirement of environmental control downstream. The Sub-Group has, however, directed that minimum quantity of water required from environmental consideration must be released downstream of the SSP. As per recommendations of the MS University, Vadodara 45 cumecs, of water flow restricted the salinity ingress to 3 PPM at about 72 km from mouth of the estuary. CWPRS have observed that 30 cumecs water can keep the salinity ingress to about 75 km. Besides salinity, the issues related with health hazards, fisheries, conservation, river morphology, sedimentation, water table, pollution etc. have to be addressed.

Considering all these issues, the Sub-group has directed for maintaining minimum flows downstream and accordingly even during closure of construction sluices, Govt. of Gujarat maintained minimum flows downstream by pumping through electric motors. A breach in this condition was reported recently when flows downstream were stopped during repair of stilling basin of the Godbole gates.

The Chairman stated that it is necessary to maintain downstream flows to a minimum level otherwise it may be hazardous for the environment downstream

specially with regard to flora and fauna, fishes, pollution, health etc. He desired that bare minimum quantity of water is required to be assessed and flows maintained accordingly in downstream by all means without fail. He desired NCA to monitor and evolve a mechanism to ensure that the water downstream never falls below the minimum specified. If feasible this should be monitored hourly. In case of any shortfall, reservoir operation should be controlled in such a manner that minimum quantity downstream never gets restricted. This was agreed to by the party States.

Member (E&R), NCA suggested that this could be ensured through the Sardar Sarovar Reservoir Regulation Committee constituted for the reservoir operations and could be included in the terms of reference of the committee. Possibilities of installation of sensor etc. to collect this information through a real time data acquisition system could be explored later on. The Managing Director, SSNNL pointed out that the study report have indicated that 600 cusecs of flow would be adequate for maintaining environmental downstream and he assured that the Govt. of Gujarat shall be maintaining such flows as would be necessary for meeting the additional downstream requirements for safeguarding the environment.

**B. Status readiness on implementation of the environment safeguard measures commensurate with raise in the height of the dam to EL-121.92 m as desired by the Sub-Group.**

The representative of the party States of GOG and GOM mentioned that the information contained in the compilation of progress presented with the agenda was as back as September 2004 and a lot of progress has been made in almost all the areas of concern after that. The Sub-Group, therefore, may review the status of all the issues based on the information provided during the meeting and consider giving clearance for raising the dam to the next stage of construction i.e EL-121.92 m.

In response to a question from the Chairman, Director (Environment), NCA informed that the progress reports of the works beyond what was presented in the agenda papers were received from the project authorities and is under scrutiny. The Chairman desired that the latest status of progress received from the project authorities and as informed during the meeting should form a part of the minutes. Abstracts of the report are placed at **Annex-XLI-Min-(3)**.

The Director (IA), MOEF stated that it was necessary to assess the status of compliance with the help of independent experts/agencies. He suggested that status of

compliance should be assessed in a given time frame through such agencies. The Vice Chairman, NVDA stated that NCA is an autonomous organization which can be entrusted for any verification that might be required by the Sub-Group instead of involving any other agency.

To a query from the Chairman regarding the mechanism followed by the NCA for assessment of the status of compliance, it was informed by the Director (Environment), NCA that in accordance with the suggestions of the Environment Sub-Group, Peer groups consisting of experts drawn from premier organizations on identified issues such as flora and fauna, archaeology, seismicity and rim stability, fisheries, health etc were formed earlier. These groups have been reviewing the reports and plans received from the party states and have been suggesting the corrective actions for improvements and avoiding delays. Last review was taken by Health experts who visited the project sites in Madhya Pradesh, Maharashtra and Gujarat during 2001. It was pointed out that Environment Sub-Group has also formed committees of experts for visiting the project areas, review of the action plans etc from time to time. Similar exercises could again be taken up for assessment of the progress of works in accordance with the requirements.

Shri B.G.Varghese, stated that, it shall be appropriate to give clearance for raising of the height of Sardar Sarovar Dam as the benefits from the project have already started pouring after having invested huge amount of money in it. He stated that a decision has to be taken considering the scenario with project and without project.

**Govt. of Madhya Pradesh:**

The Vice Chairman, NVDA stated that there have been substantial compliances by Govt. of Madhya Pradesh and the remaining work would also as assured shall be completed by the end of March, 2005.

**Govt. of Gujarat :**

The Managing Director, SSNNL stated that as per the construction schedule dam height is required to be raised to EL 121.92 M by the end of June, 2005 i.e before the monsoon of 2005 and that it would take about 5 months time to complete the required construction by that date. He therefore requested the Sub-group to consider

the request of Govt. of Gujarat favourably specially in view of the fact that there was substantial compliance on almost all the areas by Govt. of Gujarat and the areas where there are little shortfalls are mostly long term issues. The status for such issues would remain the same even after a year. He conveyed assurance of the project authorities for completion of all the remaining works as promised by the end of March, 2005.

The Sub-Group reviewed the implementation of the environmental action plans and preparedness of the project authorities for completion of the remaining works. A brief of the review based on the progress submitted by the state governments of Gujarat, Maharashtra and Madhya Pradesh during the meeting is presented in a tabular format enclosed at **Annex-XLI-Min-(4)**,

It was observed by the members of the Sub-Group that there was substantial compliance on most of the areas, but still there are gaps, which are required to be filled up by concrete actions on the ground by the party states and considering that Govt of Gujarat, Maharashtra and Madhya Pradesh have conveyed their assurance for completion of all the remaining activities by the end of March 2005, Sub-Group gave clearance for raising the dam height from EL-110.64 m & upto EL-121.92 m and at the same time asked the party States to implement all the environmental safeguard measures, as discussed, in the letter and spirit. The Sub-Group recommended to NCA to permit raising the height of dam to the next stage of construction i.e upto EL-121.92 m from environmental angle.

**Item No. XLI-3(191): REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES - INDIRA SAGAR PROJECT**

**Item No. XLI- 4 (192) : SHARING OF THE COST OF THE TREATMENT OF  
FREELY DRAINING CRITICALLY ERODED CATCHMENT  
AREAS.**

**Item No. XLI- 5 (193) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF  
THE PREVIOUS MEETINGS.**

On a request from the party states of Gujarat and Madhya Pradesh, the above agenda items were deferred for discussions during the next meeting of the ESG of NCA. Chairman, however, desired that concerned officer from the Planning Commission should be associated in the meetings of the Sub-Group for meaningful discussions on the issues related with Command Area, Catchment Area Treatment etc.

The meeting ended with vote of thanks to the Chair.



**DATE AND VENUE OF THE NEXT MEETING**

The 42<sup>nd</sup> meeting of the Environment-Sub Group was fixed for 9.00 A.M. on 7<sup>th</sup> April 2005 at Paryavaran Bhawan, New Delhi.

# ANNEXURES

**LIST OF PARTICIPANTS OF THE 41<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF NCA HELD ON 6<sup>th</sup> January, 2005 AT PARYAVARAN BHAWAN, NEW DELHI.****Ministry of Environment & Forests**

1. Dr. Prodipto Ghosh, Secretary, MOEF, New Delhi
2. Shri R. Chandra Mohan, Joint Secretary, MOEF, New Delhi.
3. Dr. Shiva Kumar, Director, MOEF, New Delhi

**Ministry of Water Resources.**

1. Shri A.D. Bhardwaj, Commissioner (PR), MOWR, New Delhi.
2. Shri P. Padmanabhan, Sr. Jt. Commissioner (PR), MOWR, New Delhi.

**Narmada Control Authority**

1. Shri Jhujhar Singh, Member (E&R), NCA, Indore
2. Dr. Pawan Kumar, Director (Environment), NCA, Indore

**Sardar Sarovar Construction Advisory Committee**

1. Shri Indra Raj, Secretary, SSCAC, Vadodara

**Botanical Survey of India**

1. Dr. K.P. Singh, Joint Director, B.S.I., Allahabad

**Wildlife Institute of India**

1. Dr. V.B. Mathur, Professor, WLI, Dehradun.

**Archaeological Survey of India**

1. Shri R.S. Jamwal, SAE, ASI, New Delhi.

**Anthropological Survey of India**

1. Dr. A.K. Bhatia, An.S.I., New Delhi

**Indian Council of Medical Research**

1. Dr. D.K. Paul, Asst. Director General (WTA), ICAR. KB., New Delhi

**EXPERT MEMBERS**

1. Prof. R.K Katti Expert Member, New Delhi.
2. Prof S . Ramashesan Expert Member, New Delhi.
3. Shri B.G. Varghese, Expert Member,

### **GOVERNMENT OF GUJARAT**

1. Shri S.K.Mohapatra, Managing Director, SSNNL, Gandhinagar.
2. Dr. Amar Jit Singh, Commissioner Health, Govt. of Gujarat.
3. Shri Arjun Singh, Principal Secretary, Forest & Environment, Govt. of Gujarat.
4. Shri A.S. Bharti, Director (CAD), SSNNL, Gandhinagar
5. Dr. A.K. Varshney, Conservator of Forests, SSNNL, Gandhinagar.
6. Shri Ashwin Parmar, Spl.(Env.), SSNNL, Gandhinagar
7. Shri Anil B. Mandavia, Director (C), SSNNL.
8. Shri Dhimant B. Vyas, Executive Engineer (CAD), SSNNL, Gandhinagar.

### **GOVERNMENT OF MADHYA PRADESH**

1. Shri Pradip Bhargava, Vice Chairman, NVDA, Bhopal
2. Shri A.K. Dubey, Member (E&F), NVDA, Bhopal
3. Dr. P.W. Kavathakar, Health Advisor, NVDA, Bhopal.
4. Shri A.K. Jain, Subject Matter Specialist (Afforestation), NVDA, Bhopal.
5. Shri V.B. Bhatt, Dy. Manager (Env.) , NHDC, Bhopal

### **GOVERNMENT OF MAHARASHTRA**

1. Shri B.P. Pandey, Principal Secretary, (Energy & Env.) Govt. of Maharashtra, Mumbai.
2. Shri Sarvesh Kumar, CCF, Dhule Circle, Dhule ,Maharashtra.
3. Shri B.N. Patil, Sc.-II, Environment Department, Govt. of Maharashtra.

### **GOVERNMENT OF RAJASTHAN**

1. Shri Lalit Mehra, Secretary Environment, Govt. of Rajasthan, Jaipur.

**ANNEX-XLI -Min-(2)****SARDAR SAROVAR NARMADA NIGAM LTD**

(A wholly owned undertaking of Government of Gujarat)

**S.K. Mohapatra, IAS**  
**Managing Director**

CAD-TECH/ESG/8:04 / 18  
 23<sup>rd</sup> September, 2004

✓ The Director (Environment)  
 Narmada Control Authority  
 116-BG, Scheme No.74-C  
 Vijaynagar  
 Indore – 452 010  
 Madhya Pradesh

Sub: Minutes of the 40<sup>th</sup> meeting of Environment Sub-group  
 Ref: Your letter No.Env-3(40)2004/dated 5<sup>th</sup> August, 2004

Dear Sir,

The minutes of the 40<sup>th</sup> meeting of Environment Sub-group held at New Delhi on 28.6.2004 is received vide letter under reference.

2. Your attention is drawn on item No.XI-2(185)(B)(C) wherein on page No.8 in the last para it is mentioned as under:

“The Chairman summed up the discussions by saying that water might be drawn from the SSP for generation of power if so envisaged but after generation of power it should not be utilized for irrigation in S.S.P Command. until approved plan to mitigate negative impacts was implemented and till then this water must be released into the Narmada river system”

3. I would like to invite your attention to the fact that during the meeting this point was not decided in this manner. During the meeting it was discussed that pari passu formulation and implementation of CAD plan should be carried out along with raising of the dam height. As you are aware, CAD plan for the area falling under irrigation for dam a height of 110.64 mtrs (i.e. phase-I) has already been formulated and circulated to NCA and members of Environment Sub-group. Even the comments of the members were complied with and the compliance was also discussed in the 39<sup>th</sup> meeting and was found acceptable in

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130

general. Hence the question of not utilizing the water for irrigation does not arise at all.

4. You are requested to take step to delete this portion from minutes of the meeting.

Thanking you,

Yours sincerely,



(S.K. MOHAPATRA)

Copy for kind information to:

1. The Secretary (WR) & Chairman  
Narmada Control Authority  
Shram Shakti Bhavan  
Rafi Marg, New Delhi 110 001
2. The Chief Secretary,  
Government of Maharashtra,  
Mantralaya  
Mumbai
3. The Chief Secretary  
Government of Rajasthan  
Secretariat  
Jaipur
4. The Chairman  
SSNNL
5. The Director (CAD), SSNNL
6. The Chief Conservator of Forests, SSNNL
7. The Ex-Engineer, CAD Wing, SSNNL

**ANNEX – XLI-Min.(3)****ABSTRACT OF THE ATR RECEIVED FROM THE STATES OF GUJARAT, MAHARASHTRA & M.P. AFTER CIRCULATION OF THE AGENDA PAPERS OF THE 41<sup>ST</sup> MEETING OF ENVIORNMENT SUB-GROUP.****Govt. of Maharashtra**

<b>Sl.No</b>	<b>Letter No. &amp; Date</b>	<b>Subject</b>	<b>Abstract</b>	<b>Remarks</b>
1.	D-2/Plan/ CR-71/03- 04/ow. 548 of 04-05 dtd. 22.11.04	Environment Safeguard Measures	<p><b>CAT:-</b></p> <p><b>forest area:</b> quality report within 4 to 5 months</p> <p><b>Non forest area :</b> Quality assessment by Water Conservation Research and Training Institute, Vasad cost Rs.1.5 lacs study to commence by monsoon of 2005.</p> <p><b>CA :</b></p> <p>53% Notification completed remaining in progress.</p> <p>Survival rate of the plantation for 14710 ha reported as 48%. Balance information shall be submitted soon.</p> <p><b>FFC:</b></p> <p>No endangered wildlife species.</p> <p>Rehabilitation measures for the wildlife moving out from the submergence area in form of buffer zone plantation shall be started after receipt of funds.</p> <p>Other activities are also subject to receipt of funds.</p> <p><b>Felling of Trees :</b></p> <p>Upto 110m. completed except for 27 ha.</p> <p>Between 110m and 134.68m shall be completed before Monsoon of 2005 subject to receipt of fund.</p>	Subject to verification.
2.	Matysa(I)/01 1403/2168 date 4.12.04	Fisheries Conservation & Development	Revised action plan for Rs.298.85 lacs received.	Implementation unlikely due to bottlenecks

3.	D-2/Pln/CR-58/02-03/644 of 2004-05 dtd. 24.12.2004	Rehabilitation of Wildlife moving out from the submergence area.	Request for release of funds from Secretary (CAD), GoM.	Bottleneck is allocation of resources
4.	DHS/PDE/Environment Study/7 A/04 dated 1.1.2005 and DHS/PDE/Narmada Control/D-7 a/04 dated 17.11.04	Health Aspects :	<p>Reports on progress on health aspects.</p> <ul style="list-style-type: none"> <li>► Epidemiological studies commence interim report by March 2005.</li> <li>► Implementation of the Action plan held up as the Cheque issues was dishonored by the bank due to technicalities.</li> </ul>	Subject to verification. by experts.

**Govt. of Madhya Pradesh**

Sl.No.	Letter No. & Date	Subject	Abstract	Remarks
5.	NVDA/E&R/Tech./1925 dated 4.12.2004	ESM	<p>CAT Quality</p> <p><b>Forest Area</b> : Not justified.</p> <p><b>Non forest area</b> : Negotiations with Central Soil Water Conservation and Research and Training Centre, Datia making progress.</p> <p><b>Comp. Afforestation</b>: Yardstick for assessment of success for plantations enclosed.</p> <p><b>FFC</b> : Social forestry programme started at an estimated cost of Rs.5.0945 crores by the State Department.</p> <p>Proposal for rehabilitation of Wildlife through creation of sanctuaries and other measures is under consideration of Environment Sub-Group.</p> <p>Fisheries : Revised plan includes measures for rehabilitation of vulnerable species.</p> <p>Asst. Director (Fish.) collection information on fish landing and social economic</p>	Subject to verification.



			<p>survey.</p> <p>Measures for rehabilitation of endangered species shall be included in the revised plan.</p> <p>Studies of Limnology on making progress.</p> <p><b>Felling of Trees:</b> Completed in forest areas whereas non forest areas felling was in progress.</p> <p><b>Health Aspects :</b> Reports progress on incremental health facilities.</p> <p>Archaeology :</p> <p>Relocation of Shiv temple at Choti Kasrawad affected by backwater of SSP at 121.92m RL is held up due to resistance.</p>	
6.	DO No. SMS/4/04/198 dated 1.1.2005	Health Aspects	<p>Reports on incidence of diseases for the SSP/ISP &amp; OSP for the period 2003-04.</p> <p>Further work was making progress.</p>	Subject to verification.
7.	NVDA/E&F/ Tech./18	ESM	Information requested by Dr. Shekhar Singh Member, ESG, NCA	

**Govt. of Gujarat:**

Sl.No	Letter No. & Date	Subject	Abstract	Remarks
8.	SSNNL/Env/ESG-41/1057 dated January 1, 2005	Supplementary ATR on CAD	<p>Programs for providing incentives to the farmers willing to adopt measures recommended in the reports such as educational &amp; training, incentives.</p> <p>Short note on existing facilities for agricultural extension in the Command area with emphasis of education. Awareness programs for limiting pesticides and Weedicides.</p>	Subject to verification of the implementation of the planned measures commensurate with the progressive irrigation.
9.	SSNNL/Env/ESG-41/798-99 dated October 19, 2004	Additional agenda proposed	Request for permission for raising the dam height	
10.	SSNNL/Env/ESG-41/1017 dated	Compensatory	Copies of the notification for the	Subject to

	Dec 27/28, 2004	Afforestation	plantations areas.	verification.
11.	SSNNL/Env/ESG-41/1007 dated December 27, 2004.	ESM :	Information submitted for forwarding it to Dr. Shekhar Singh, Member (ESG)NCA.	
12.	SSNNL/Env/ESG-41/1971 dated Dec. 07, 2004 and SSNNL/Env/ESG-41/958 dated Dec.07, 2004	ESM	Reports on progress of survey / studies / implementation of the environment safeguard measures	Subject to verification.
13.	SSNNL/Env/ESG-41/888-89 dated Nov. 9, 2004	CAT	Reports on progress of qualitative assessment of the completed CAT works	Subject to verification.
14.	SSNNL/Env/ESG-41/982 dated Dec. 10/13, 2004	CAD & Downstream	Provides short notes on the siltation aspects in the main canal and soil salinity in the downstream areas in Bharuch and Vadodara District.	
15.	SSNNL/Env/Nal/A P/929 to 37 dated Dec. 1, 2004	Sanctuary Development	Encloses Action on Nal Sarovar Bird Sanctuary in Gujarat.	

**Govt. of Rajasthan**

Sl.No.	Letter No. & Date	Subject	Abstract	Remarks
16.	SE/NCPC/T-23/04-05/3270 dtd. 13.12.04	Command Area	Progress on Environment Management Plan	In adequate and not satisfactory.
17.	se/ncpc/t-23/04-05/38 dated 3.1.05 Fax Message	-do-	2 pages from the plan submitted as plan for Management of Environmental Impacts.	-do-
18.	TF(3)1/NMC/ACE/11127 dtd. 28.10.04	CAD	Table showing proposed cost of plantations along with canal bank	-do-
19.	T/F(3)1/NMC/Env /ACE/Ju/11654 dated 16.11.2004	CAD	Replies to the observations of Dr. S. Ramaseshan.	Sent to Dr. S. Ramaseshan.

**ANNEX – XLI-Min.(4)****Status of readiness on implementation of the environment safeguard measures commensurate with raise in the height of the dam to EL 121.92 m as presented to the Environment Sub-Group during its 41<sup>st</sup> meeting held on 6<sup>th</sup> January, 2005**

State Govts. presented the information for a review by the members of the Sub-Group as brought out in the table below :

		<b>Requirements for pari-passu compliance</b>	<b>Gujarat</b>	<b>Maharashtra</b>	<b>Madhya Pradesh</b>
<b>Catchment Area Treatment</b>	<b>Physical</b>	Treatment of catchment area for Phase-I	Completed	Completed	Completed
	<b>Qualitative</b>	<b>Assessment of adequacy</b>  Final reports assured for submission by March, 2005.	► <b>Forest areas :</b> Report under updating. ► <b>Non-forest areas:</b> Interim report submitted.	► <b>Forest areas:</b> Forest Survey of India, Nagpur entrusted with updating the report. ► <b>Non forest areas:</b> negotiations with Central Soil Research & Training Institute are progressing. Reports assured.	► <b>Forest areas:</b> Forest Survey of India is updating the report. ► <b>Non forest areas:</b> negotiations with Central Soil Research & Training Institute are progressing. Reports assured.
<b>Felling of trees</b>		Entire tree growth including coppice crop from the submergence area should be removed before commencement of impoundment Final reports assured for submission by March, 2005.	Completed Reports on coppice crop assured.	Completed upto 110 MRL except 27 ha. work progressing for 120.92m RL.  Completion reports assured.	Completed in Forest areas Reports on non forest area assured.  Completion reports assured.
<b>Flora Fauna</b>		Completion reports assured for submission by March, 2005.	► Implementation report on recommendations of the studies ► Progress on development of Sanctuary :	► Implementation report on recommendations of the studies such as Buffer zone plantations, as planned could not be taken up for the allocation of resources.	► Implementation report on recommendations of the studies & social forestry plan assured ► EIA report on proposed sanctuaries assured.
<b>Carrying Capacity</b>			Estimated for sanctuary being ensured through sanctuary development	Reports assured.	Reports assured.

<b>Fisheries Conservation Aspects</b>		Draft plan available. Implementation progressing	<ul style="list-style-type: none"> <li>► Studies entrusted to CICFRI assured for completion.</li> <li>► Implementation of the plan could not be taken up due to problems both legal and allocation of resource.</li> </ul>	<ul style="list-style-type: none"> <li>► Implementation progressing.</li> <li>► Revised plan assured.</li> </ul>
<b>Down-stream Environment</b>	Detailed plan & Implementation report to be submitted by March 2005.	Compliance on the issues raised during the meeting to be submitted.	Not applicable (N.A)	N.A.
<b>Command Area Development</b>	implementation of the planned measures commensurate with progressive irrigation in the command. Submission of the volume-II of the Phase-II plan.	Compliance to be submitted by March 2005.	N.A.	N.A.
<b>Health</b>	Addl. Facilities as required must be provided. Monitoring reports should also be available. Data to be put up on the web site.	Compliance to be submitted by March 2005.		
<b>Seismicity &amp; Rim Stability</b>	Collection and analysis of data should be a continuous process.	Compliance to be submitted by March 2005.		
<b>Archaeology</b>	Relocation / protection	Completed	N.A.	Compliance to be submitted by March 2005.
<b>Anthropology</b>	protection / excavation	N.A.	N.A.	Completed.



केवल सरकारी प्रयोग के लिए  
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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**बयालिसवी बैठक की कार्यसूची**  
**Agenda for the 42<sup>th</sup> meeting**

स्थान : पर्यावरण भवन, नई दिल्ली  
Venue : Paryavaran Bhawan, New Delhi

दिनांक : 7 अप्रैल 2005 9.00 बजे पूर्वाह्न  
Date : 7<sup>th</sup> April, 2005, 9.00 A.M.

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**मार्च, 2005**  
**Indore**  
**March, 2005**

## AGENDA FOR THE 42<sup>nd</sup> MEETING OF ENVIRONMENT SUB-GROUP

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## AGENDA FOR THE 42<sup>nd</sup> MEETING OF ENVIRONMENT SUB-GROUP

### Item No. XLII-1(194) : CONFIRMATION OF MINUTES OF THE 41<sup>st</sup> MEETING OF THE ENVIRONMENT SUB-GROUP.

Minutes of 41<sup>st</sup> Meeting of Environment Sub-Group of Narmada Control Authority held on 6<sup>th</sup> January, 2005 were circulated to all Members and Invitees vide NCA Office letter No.Env-3(41)/2005/1014-1054 dated 11<sup>th</sup> February, 2005.

Managing Director, Sardar Sarovar Narmada Nigam Ltd. (SSNNL) vide his letter No. CAD/TECH/ESG/8/P.II/2005/106 dated 7<sup>th</sup> March, 2005 **Annex-XLII-(1)**, has desired corrections in the minutes of the 41<sup>st</sup> meeting referring to modified para of the minutes of the 40<sup>th</sup> meeting as brought out below:

As recorded in 40 <sup>th</sup> meeting	As recorded in 41 <sup>st</sup> meeting	Corrections as suggested. M.D., SSNNL.
<p>The Chairman summed up the discussions by saying that water might be drawn from the SSP for generation of power if so envisaged but after generation of power it <b><u>should not be utilised for irrigation</u></b> in SSP command, until approved plan to mitigate negative impacts was implemented <b><u>and till then this water must be released into the Narmada river system.</u></b></p>	<p>The Managing Director, SSNNL referred to his letter dated 23<sup>rd</sup> September 2004 [copy placed at <b>Annex-XLI-Min-(2)</b>], seeking corrections in the minutes under item No.XL-2(185)/(B)(C) on page-8 in the last para. <u>He explained that it was not technically possible to let down the water back into the river, after generation of power</u>, as the maximum discharge capacity of the Godbole gates was limited to about 7000 cusecs only whereas the discharge from the CHPH (all the five units) after generation of power was of the order of 25000 cusecs. <b>The Chairman however stated that the minutes as recorded reflect as to what was stated during the last meeting</b> but in view of the submission of the Govt. of Gujarat as brought above, the issue could be discussed.</p> <p>The Sub-Group considered the request and agreed for partial amendments</p> <p>"The Chairman summed up the discussions by saying that water might be drawn from the SSP for generation of power if so envisaged but after generation of power it should not be utilized for irrigation in the SSP command until approved plan to mitigate negative impact was implemented".</p>	<p>"The Chairman summed up the discussion by saying that water might be drawn from the SSP <b><u>both for power and irrigation</u></b> but the implementing state must ensure that all measures as envisaged in the CAD plan are properly implemented so that there is no negative impact of such irrigation."</p>

The minutes are put up for confirmation.



**Item No. XLII-2(195): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.SARDAR SAROVAR PROJECT:**

During the last meeting the Sub-group on the request received from the Party States, reviewed the preparedness on of the project authorities for raising the dam height from EL 110.64m to EL 121.92 m vis-à-vis status of implementation of the Environment Safeguard Measures.

The resulting impoundment upstream of SSP would submerge an area of 16,814.57 ha, out of a total of 37,533 ha., as was ascertained from the area capacity curve of the SSP annexed with the project report.

After discussions and assurances by the Party States for completion of the remaining works related to Environmenetal Safeguard Measures by the end of March, 2005, the sub-group recommended to the NCA to permit raising in the dam height to EL 121.92m. Action Taken Report as on 15<sup>th</sup> March 2005 is presented below for a review by the Sub-group.

**A) Action Taken Report on implementation of the environment safeguard measures.**

		Requirements for pari-passu compliance	Gujarat	Maharashtra	Madhya Pradesh
Catchment Area Treatment	Qualitative	<i>Assessment of adequacy</i>  Final reports assured for submission by March, 2005.	<b>Awaited.</b>	<b>Awaited.</b>	<b>Awaited.</b>
Compensatory Afforestation	Qualitative	<ul style="list-style-type: none"> <li>▪ <i>Afforested areas to be declared as forest.</i></li> <li>▪ <i>Survival percentage, crop composition to be assessed.</i></li> </ul>	<b>Works are progressing, Completion report awaited.</b>		

<b>Felling of trees</b>	<b>Quantitative</b>	Entire tree growth including coppice crop from the submergence area should be removed before commencement of impoundment.	Completion Reports on coppice crop  <b>awaited.</b>	Completion reports for felling of trees between ❖ 110 to 110.64 ❖ 27 ha in village Bamni ❖ 110.64 to 121.92  <b>awaited. .</b>	Completion reports on non forest area  <b>awaited.</b>
<b>Flora Fauna</b>			<ul style="list-style-type: none"> <li>► Implementation report on recommendations of the studies</li> <li>► Progress on development of Sanctuary</li> </ul> <b>awaited..</b>	<ul style="list-style-type: none"> <li>► Implementation report on recommendations of the studies such as Buffer zone plantations, as planned could not be taken up for the allocation of resources</li> </ul> <b>awaited.</b>	<ul style="list-style-type: none"> <li>► Implementation report on recommendations of the studies &amp; social forestry plan progress reported.</li> <li>► EIA report on proposed sanctuaries</li> </ul> <b>awaited.</b>
		Completion reports assured for submission by March, 2005.	<b>progressing</b>	<b>awaited.</b>	<b>awaited. .</b>
<b>Carrying Capacity</b>			<b>progressing</b>	<ul style="list-style-type: none"> <li>► Studies entrusted to CICFRI assured for completion.</li> </ul> <b>No Progress reported</b> <ul style="list-style-type: none"> <li>► No Progress due to non allocation of resources</li> </ul>	<ul style="list-style-type: none"> <li>► Implementation progressing.</li> <li>► Revised plan awaited</li> </ul>
<b>Fisheries Conservation Aspects</b>			Compliance on the issues raised during the meeting to be submitted.	Not applicable (N.A)	N.A.
<b>Down-stream Environment</b>		Detailed plan & Implementation report to be submitted by March 2005.	Compliance to be submitted by March 2005.	N.A.	N.A.
<b>Downstream Flows</b>		To ensure flows downstream from Environmental Consideration	<b>Awaited.</b>		

<b>Command Area Development</b>	Submission of the volume-II of the Phase-II plan.  Implementation of the Incremental measures commensurate with progressive irrigation in the command.	Not submitted yet  Compliance awaited.		
<b>Health</b>	Addl. Facilities as required must be provided. Monitoring reports should also be available. Data to be put up on the web site.	No Compliance reported.		
<b>Seismicity &amp; Rim Stability</b>	Collection and analysis of data should be a continuous process.	Completed	N.A.	Compliance to be submitted by March 2005.
<b>Archaeology</b>	Relocation / protection	N.A.	N.A.	Completed.
<b>Anthropology</b>				

**B) Current Status of Implementation of the Environmental safeguard measures commensurate with dam height of EL 121.92m and beyond**

To facilitate a review of the compliances of the directions given by the Sub-group, for considering raise in the dam height, status of the implementation of the environment safeguard measures is presented below

**(a) CATCHMENT AREA TREATMENT**

Out of total Catchment of 24,45,163 ha, 28.4% was found critically degraded. 6.66% of the total catchment was treated under phase-I and balance area is proposed for treatment under Phase-II.

❖ **Phase-I.**

- i) Project authorities were required to prepare plans for treating those critically degraded sub-watersheds which were identified as directly draining into the reservoir. The implementation of the plan was to be pari-passu with the construction of the dam:
  - o It was informed by the Party States that the physical works on the available areas were completed.
- ii) To assess the success or failure of the CAT measures implemented at the cost of huge investments and for ensuring that structures were maintained and

remained functional monitoring through establishment of silt studies stations / remote sensing was directed by the Sub-group earlier.

S.No.	States	Forest area	Non-Forest area
1.	Govt. of M.P.	No work proposed	Progress awaited.
2.	Govt. of Gujarat	Progress awaited	Progress awaited.
3.	Govt. of Maharashtra	Progress awaited	Progress awaited.

#### ❖ Phase-II

The balance sub-watersheds were to be treated under programme for implementation in a time frame to be determined separately by the project authorities in consultation with the Ministry of Environment & Forests.

**Govt. of Gujarat :** The Phase-II areas in Gujarat was less and therefore Govt. of Gujarat treated this area under Phase-I itself. Treatment works were already completed.

**Govt. of Maharashtra :** Govt. of Maharashtra reported progress in 20861 ha against a target of 77568 ha. area

**Govt. of Madhya Pradesh:** The gross area for which plans are required to be submitted for Phase-II programme is 3,18,118 ha. However, Govt. of M.P. have expressed inability in treating these areas commensurate with progressive filling of the reservoir due to lack of resources, the progress reported was 35,312 ha.

#### (b) COMPENSATORY AFFORESTATION :

##### QUANTITATIVE.

- It was informed by the Party States that the physical works on the available areas were completed.

##### QUALITATIVE

In terms of the order of clearance the non forest areas planted up by the project authorities are required to be handed over to the regular territorial forest divisions for regular upkeep & maintenance and till such time these were to be handed over plantations were required to be maintained with watch & ward as per the planned programme.

Environment Sub-Group during 39<sup>th</sup> & 40<sup>th</sup> meeting also directed

1. Impact Assessment Studies for the new eco-system that developed in the areas planted up under the compensatory afforestation programme specially for the areas in Gujarat being away from the Narmada Ecological zone.
2. Sub-Group also directed that survival count along with species composition, year of count and the areas under each category should be regularly presented.

No further report is received from the Party States. Summary of the progress achieved by each state is presented in the **Annex – XLII-(2)**

Members may like to discuss & review.

**(c) COMMAND AREA DEVELOPMENT AND ENVIRONMENT MANAGEMENT OF DOWNSTREAM AREAS**

The command area of the project has been fixed on the basis of areas included by NWDT for purposes of considering requirement of Narmada water for irrigation. Stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India required series of actions to be taken on the field before commencement of irrigation. Key requirement is indicated in the **Annex – XLII- (3).**

**GOVT OF GUJARAT**

1. In Gujarat the GCA of the project is 3.43 million hectares of which Cultivable command is estimated to be 2.12 million hectares. In order to achieve increase in efficiency of irrigation with the limited quantity of water without impacting the environment adversely, the Govt of Gujarat planned to introduce several measures. However stipulated action as per the CAD plan on formation of the farmers' co-operatives, volumetric water release to them, rotational water distribution, canal automation etc are not yet operational as brought out in the table placed at **Annex-XLII-(4).**
2. In addition Gujarat also planned to provide drinking water to Saurashtra and Kachchh regions through a separate drinking water project. Detailed project report and mitigatory measures planned on this project are awaited.
  - Progress on implementation of the Safeguard measures to contain identified negative consequences of the irrigation and also to enhance the positive impacts environment safeguard incremental measures proposed in the CAD Plan giving details on scheduling and budget commensurate with irrigation plan as brought out in the table above(ATR), is yet awaited.
  - A plan for management of downstream environment was made available by the GOG earlier. However this plan lacked details on the measures proposed for safeguarding the drinking water supplies, health, flora and fauna, salinity ingress; breeding of fishes, water quality etc. Phased programme along with budget and monitoring proposal is yet awaited. A detailed report on steps taken by Govt. of Gujarat for protection of the Environment during raising of the dam height is also awaited.

Progress may please be presented by the Govt. of Gujarat for a review by the members.

**Govt. of Rajasthan**

In Rajasthan for 2.3 million ha of GCA, Command Area Development Plan is required to be prepared and implemented commensurate with the development of irrigation in the command area.

Command area Macro plan for the areas in Rajasthan was received and circulated to the Members. This plan included a reconnaissance report on general flora & fauna of the command. A copy of this report is placed at **Annex – XLII-( 5).**

This report lacked necessary details. The Sub-group have directed GoR to carry out the study and preparation of the plan on the lines carried out by Govt. of

Gujarat. Accordingly a detailed phased plan with budget & monitoring for implementation of the Environment Safeguard Measures as brought out by the EIA study reports commensurate with progressive development of the Command Area is awaited.

<b>Rajasthan</b>	
Initial plan was submitted during 1990	Sub-group directed for revision & EIA studies.
EIA studies	Completed by WAPCOS. Area to be irrigated was increased
Preparation of the Plan through ICCB	Plan submitted by GoR and circulated to the Members for a review. A phased programme with budget & monitoring awaited.

During the last meeting also, it was suggested that Govt. of Rajasthan should examine the technological options and should choose appropriate approved technology for mitigating the negative impacts on environment and report back during the next meeting of the Sub-Group. GOR have been requested by the Environment Sub-Group to submit detailed plan on the lines as submitted by Gujarat. The GoR may brief the Sub-Group about the progress.

#### **(d) FLORA, FAUNA & CARRYING CAPACITY**

The guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora and fauna present can be assessed, listed (rare and endangered) species can be detected, if present, and appropriate conservation measures devised before commencement of the submergence.

Implementation of the recommendations contained in the EIA studies carried out by the agencies engaged by the Gujarat, Maharashtra & Madhya Pradesh were required to be implemented in time. The present status towards key recommendations on which progress is awaited are presented in the **Annex – XLII (6)** :

##### **Govt. of Maharashtra :**

EIA reports indicated presence of rare, endangered and threatened species of wildlife calling special measures for their conservation. State Govts. proposed amongst others two critical restorative measures as brought out below :

1. Buffer zone plantations for rehabilitation of wildlife moving out from the submergence area.
2. Management of corridors for shifting of wildlife, several corridors, passing through moderate to good ( $0 > 3$ ) vegetation cover.

No progress is reported as brought out in the table below:

These measures were required to be taken before commencement of submergence in terms of the order of clearance and direction of the Sub-group. However Govt. of Maharashtra due to lack of inter departmental coordination allotted no resources for implementation of the safeguard measures resulting in difficult situation. Sub-Group considered the requests on the assurances of the project authorities for completion of needed safeguard measures in time. No progress is reported yet where as 80% of the submergence is already affected in Maharashtra.

##### **Govt. of Gujarat :**

M.S. University, Vadodara conducted EIA & recommended several measures

for preparation of Environmental Management plan for the upstream environment. Key recommendations focused amongst others on the following issues.

- Rehabilitation plan for the identified animals and plants.
- Recommendations of the M.S. University, focusing on activities of the joint forest management committees and specific recommendations for the protection and conservation of *Butea monosperma* (yellow variant) and *Radermachera xylocarpa* which were unique and represented important and rare floral element
- To undertake development programmes in rural areas in natural watershed unit.
- Training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state.
- An independent monitoring and evaluating infrastructure for successful execution of these strategies and action plans.

Govt. of Gujarat reported progress on development of Shoolpaneshwar Wildlife Sanctuary. Further progress on other recommendations of the EIA study group is awaited. A detailed report on development works under implementation in the Sanctuary areas and on migration of wild animals during progressive filling of the reservoir may please be presented.

#### **Govt., of Madhya Pradesh :**

State Forest Research Institute, Jabalpur carried out the EIA for the areas in Madhya Pradesh and recommended measures for drawing up of the environmental management plan. The key recommendations of the study report are presented in Annex-XLII-(3). State Govt. however proposed restorative and ameliorative safeguard measures as brought out below :

1. To cater to increase requirement of timber, fuel-wood etc., social forestry programme at an estimated cost of Rs.5.0945 crores chargeable to SSP (price level of 1999-2000) with escalation of 9% pre annum was approved by the State Wildlife Committee.
2. 60 islands which will be formed in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.
3. Studies recommended creation of two wildlife sanctuaries namely Mathwad (34.659 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district. The State Wildlife Committee had not accepted these recommendations during its earlier meeting (July, 2000). However, during its meeting convened recently (November, 2002) reconsidered its decision and recommended creation of Mathwad sanctuary (at an estimated cost of Rs.21.76 crores) as per recommendation of SFRI but instead of Bokrata Sanctuary recommended Kathiwada Sanctuary (at an estimated cost of Rs.13.97 crores) a little away but within the same ecological zone.

GoMP also proposed formulae for sharing of the cost of the development of all the sanctuaries and National parks, proposed to be developed in the basin from ISP to SSP, in the same proportion as agreed for dam and appurtenant works for ISP and SSP. A proposal in this regard was submitted by the GoMP and was circulated along with minutes of the 40<sup>th</sup> meeting of Env. Sub-group. During this meeting, after some discussions on the issue, it was observed by the Sub-group that it would be pre-mature to discuss creation of these sanctuaries without an EIA report.

Members may like to discuss and review the progress on implementation of the

environment protection measures in view of the progressive impoundment which has already commenced since 1994.

### **Aquatic Environment :**

Impoundment in SSP commenced with the closure of construction sluices during Feb 1994. The impoundment has progressed with the attainment of height of E.L. 110.64m resulting in much larger water spread, requiring a number of sequential actions, in accordance with pre & post impoundment action plan suggested by the CICFRI to safeguard the aquatic environment as brought out in the **Annex – XLII – (7)**.

Most of the suggested actions as presented in the table at Annex – XLII-(7) awaited implementation. This will have serious consequences on the aquatic environment up-stream of the SSP.

Members may like to discuss and review.

### **Felling of the Trees in the submergence area**

Plans for felling of trees in the forest area coming under submergence to avoid the possibility of animals being trapped in the submergence area, prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc. were required for the areas in Gujarat, Maharashtra & Madhya Pradesh. Forest areas were required to be taken up for felling in a systematic manner to avoid any possibility of the same.

#### **Madhya Pradesh**

Felling in entire forest area coming under submergence is completed. However 8,159 trees in non-forest area up to FRL were yet to be felled. Details are presented in **Annex – XLII-(8)**.

#### **Govt. of Gujarat**

In Gujarat the forest area diverted was 4165.91 ha in addition 356.78 ha was diverted earlier. Thus in all 4522.69 was utilized for the SSP. Of this 4152.68 ha of the Distt. Vadodara and Bharuch required felling. The felling in Gujarat was reported to be complete. However coppice crop in the forest area felled earlier might also require felling.

#### **Govt. of Maharashtra**

In Maharashtra the forest area of 6,488 ha was diverted for submergence of which 3,157. 03 ha was forest. The balance area was under river bed, nallah etc. Of this 2288.63 ha lied between 90 m & up to four meter below the FRL.Felling of Trees



completed upto 110m. completed except for 27 ha and for the areas between 110m and 134.68m is progressing. The progress is however subject to receipt of funds. Details are presented in Annex – XLII-(8).

Members may like to discuss and review.

**(e) SEISMICITY AND RIM STABILITY**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameters. Dam design in India is regulated by a national standard developed by the Bureau of Indian Standards (BIS). The BIS has classified the Indian sub-continent into 5 zones depending on tectonic, geologic and seismic consideration using available data. The River Narmada lies in the seismo-tectonic provinces of Cambay Basin and Peninsular Shield (including the Deccan Trap) and comes under Zone 3 of the BIS classification.

**Rim stability** refers to the competency of reservoir base rocks to maintain natural slopes and to contain the stored water. Under stable conditions, there should be no significant losses of reservoir water due to ground water percolation or seepage. Where rocks are found to be highly permeable, mitigation measures are needed to ensure the longevity of the reservoir.

The GOG appointed a Dam Review Panel, comprising engineers and geologists, to evaluate the report and findings and a revised final report was submitted to the project authorities in 1982. The main mitigation measures suggested were as follows :

- Construction of dams and Infrastructure (Incorporating seismic design coefficients) to withstand the maximum credible earthquake
- Establishment of seismic monitoring stations at key locations around the reservoir

ACTION	STATUS
Dam design modifications : <ul style="list-style-type: none"> <li>▪ Adoption of horizontal design coefficient of 0.125g on the recommendation of the Dam Review Panel</li> <li>▪ Installation of stress monitors in the main body of the dam</li> <li>▪ Increase of the depth of the foundation to 18m below the lowest riverbed.</li> </ul>	Completed

▪ GSI (Nagpur Division) Rim Stability studies	Completed
▪ Tracer Studies by CWPRS	Completed
▪ Monitoring stations	Rim stability studies have been completed and well equipped 9 monitoring stations along with periphery of the reservoir 4 each on either side and one at the downstream of the Sardar Sarovar reservoir. Out of a total of 9 stations, 3 in M.P. (Alirajpur, Kukshi and Badwani, 1 in Maharashtra (Shahada) and 5 in Gujarat (Kawant, Naswadi, Kevadia, Jitgaon
▪ Results of analysis of data from monitoring stations.	Received, analysed by the dam safety review panel of the SSP during October, 2001.

Regarding up-gradation of network, the technical specifications were being worked out in consultation with IMD. The up-gradation was likely to cost about Rs.5.50 crores. GoG had planned to invite tenders by August, 2004 for the same work. The work was to be completed by September, 2005.

It was reported during 40<sup>th</sup> meeting that Seismic activity at the dam site and around the periphery was being studied by a team of experts. The data was being analysed and annual seismological bulletins were being published. GoG had requested the Director General, Indian Seismological Research Institute (ISRI), for the evaluation of the Seismic data obtained by the SSNNL

Further progress may please be reported by the GoG for a review by the members .

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, a specific requirement for the SSP contained in the environment clearance order of GOI was that the plans for the provision of health facilities to workers and residents of the affected areas should be prepared. Each State should take necessary measures to minimise the risk of malaria, filarial, schistosomiasis and other diseases associated with water that may result from implementation of the project. Preparation of an Action Plan for the surveillance and control of malaria was also stipulated.

As per the further directions received from the MoEF, the states were required to take up measures given in the following table.

	Mitigation measures	Gujarat	Maharashtra	Madhya Pradesh
1.	Present status of the waterborne disease in the areas		Completed	

2.	Screening arrangements proposed for the work force;	Completed	Not relevant	Not relevant
3.	Epidemiological Surveillance studies	Completed	Phase-II study yet to start	Completed
4.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases	Action plan under implementation	Revised Action plan awaited	Action plan revised Aug. 2003
5.	Reinforcement proposed to the existing health delivery system commensurate with height of 110.64 m RL.	Completed	Incomplete	Incomplete
6.	Surveillance of diseases	Progressing	Weak . Being implemented under M.H.S.D.P. Use of computer to record and compile the data at district level	Weak
7.	Standard formats available with the NICD to be used for diseases surveillance purpose.	Progressing	Format circulated, implementation awaited.	Awaited
8.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	Progressing	Awaited, two water quality labs working , four being operationalised. Pada Workers are appointed to perform house to house disinfections with the help of Mediclors	Awaited
9.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.	Progressing	Awaited	Awaited
10	Regular Entomological monitoring is suggested for alterations in ecology of the area due to irrigation / impoundment.	Progressing	Awaited, preventive measures planned.	Awaited
11	It is suggested that sanitary latrines be established at the R&R sites and  Villagers may be educated to use these to keep the cases of Gastro diseases in check.	Progressing	Awaited Health Department is performing IEC activities to educate the people.	Awaited
12	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited	Awaited	Awaited

The status of compliance of requirement may be discussed and reviewed by the Sub-group.

#### (g) ARCHAEOLOGY & ANTHROPOLOGY

In addition to the general obligation of the States under the provisions of the

1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out below.

- 1) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- 2) Plan for rehabilitation of monuments wherever necessary.

The current status of the protection / relocation works is presented below :

		Gujarat	Maharashtra	Madhya Pradesh
Monuments	FRL	2 ( 2 completed)	Nil	23(4)
	Commensurate with 110.64			NVDA assured that no approach shall be impacted
Mounds	FRL	Nil	Nil	15(9)
	Commensurate with 110.64			NVDA assured that not likely to be impacted
Museums/ Park	FRL			4 ( 1 completed)
	Commensurate with 110.64			Not relevant

Further progress may be informed for a review by the Sub-group.

#### (h) DOWN STREAM ENVIRONMENT

Considering that adverse effects manifest during raising the dam, Sub-group, during 39<sup>th</sup> meeting requested a plan and timely implementation of the needed safeguard during raising the SSP dam height to EL 110.64m. In compliance a copy of the plan was received and circulated to the members along with agenda papers of the 40<sup>th</sup> meeting. Members, however desired more time to study the plan. Dam height, however was raised upto the recommended height by the end of June 2004. A report on the environment safeguard measures towards compliance of the conditions / stipulations/ directions/ recommendations of the Sub-group is awaited.

During 41<sup>st</sup> meeting Prof. Ramaseshan pointed out that a comprehensive plan for management of downstream environment was not yet available. He pointed out that HR Wallingford in their studies of 1995 have brought out a series of actions required to be taken during pre and post impoundment phases of Sardar Sarovar Project as brought out below:

- ▶ Provisions for complimentary flows for mitigating pollutions in the downstream, restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone,
- ▶ Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality including physical, chemical and biological parameters,
- ▶ Developing of mathematical modeling for prediction of likely impacts of different operational scenarios for mitigation, studies on ecology and resources for the downstream environment, narrowing of river channel,
- ▶ Legal agreement between the Party States for regulated releases to ensure that project works as planned.

In addition he also mentioned that releases downstream may also have to be diluted for keeping the surface as well as ground water in good condition.

During 40<sup>th</sup> meeting it was directed by the Chairman that it was necessary to maintain downstream flows to a minimum level otherwise it may be hazardous for the environment downstream specially with regard to flora and fauna, fishes, pollution, health etc. He desired that bare minimum quantity of water is required to be assessed and flows maintained accordingly in downstream by all means without fail. He desired NCA to monitor and evolve a mechanism to ensure that the water downstream never falls below the minimum specified. If feasible this should be monitored hourly. In case of any shortfall, reservoir operation should be controlled in such a manner that minimum quantity downstream never gets restricted.

Sub-Group may discuss the status.

**Item No. XLII-3(196): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES INDIRA SAGAR PROJECT : [Deferred agenda of the previous meeting No.XLI-3(186)]**

**A. CONSTRUCTION SCHEDULE:**

Indira Sagar Project (ISP) formerly known as Narmada Sagar Project has an installed capacity of 1000 MW and annual irrigation of 1.69 lacs ha. The project is very crucial due to requirement of regulated releases of 8.12 MAF of water from this project for SSP.

After getting necessary clearances the construction works were started in May, 1992 and the dam was targeted to be completed by June, 2000. However, due to various reasons the progress lagged behind. Subsequently, the work was handed over to Narmada Hydroelectric Development Corp. (NHDC), a Joint Venture of Govt., of Madhya Pradesh and National Hydroelectric Power Corporation. The targeted date of completion has been revised to May 2005. As per the available information the concreting was completed up to minimum 245.00m RL in the central overflow portion whereas non overflow side piers were raised up to 266.25m RL and some of the blocks have also been raised. Accordingly the ISP was to submerge an area of 91,000 ha. after raising the dam to this height and consequently the land, Flora and fauna etc. shall be serious impacted.

Month / year	Level in m	Submergence area in ha.	% in relation to FRL
Level attained by June 2004	245.13	28,600	31.43
June, 2005*	MRL	91,000	100

\*It was planned to complete by Dec. 2004, now delayed .

**B) Current Status of Implementation of the Environmental safeguard measures for the Indira Sagar Project is presented below for a review by the Members**

**(a) CATCHMENT AREA TREATMENT (in ha)**

As per stipulations, considering the construction schedule, works in the entire Phase-I area should be completed by December 2004. The progress achieved upto July, 2004 is depicted below.

**1. PHASED CATCHMENT AREA TREATMENT (Area in Ha.)****Phase-I**

	Area in ha.	Treated by NVDA	Covered under Comp Afforestation	Total area treated up	Balance Area proposed to be treated by State Forest Deptt /NVDA
Non-forest	49837*	49598	00	49598	239
Forestland	11515**	4273	4587	8860	1833
Total	62,975	53871	4587	58458	2072

\* Revised targets as per micro planning( including unworkable area of 2090 ha)  
Earlier targets were 51,927 ha

\*\* Revised targets as per micro planning (including unworkable area of 822 ha)  
Earlier targets were 11,048 ha

**Phase-II**

As per stipulations, schemes for treating the Phase-II area are required to be prepared & submitted to the funding agencies like RVP/ NAED Board of MOEF/Various other ongoing schemes of the central/ State Govts. The progress achieved is about 2.26% as depicted below.

	Area in ha.	Treated by NVDA	Already treated under other schemes	Schemes submitted	Balance Area remained to be treated
Non forest	806720	20734	00	Not available	
Forest land	108430				
Total	915150	20734			894416

During the last meeting it was informed by the NVDA that progress is behind schedule due to non availability of the required funds of the order of 645.59 crores

Members may like to discuss & review.

**(b) COMPENSATORY AFFORESTATION : Planning and progress**

Ministry of Environment and Forest vide letter No. 8-646-84-FC Dated the 7<sup>th</sup> Oct. 1987 permitted diversion of 41,111.97 hectares of forest land in Khandwa, Dewas and Hoshangabad districts for the Namada Sagar Multipurpose Project. under Section 2 of the Forest (Conservation), Act, 1980, subject to the following key conditions that :

1. Compensatory afforestation will be carried out over suitable degraded forest land

double the diverted forest area in extent and in addition to the equivalent area in non-forest land. However subsequently the scheme for compensatory afforestation submitted vide letter Nos. F.D /AAA/ AO/3 dated 13.11.1987, as detailed below was approved by the MOEF . However additional compensatory afforestation over 150 ha. degraded forest was directed.

2. The areas will be surveyed, demarcated and declared protected forests and placed under the control of the Forest Department for compensatory afforestation at the cost of the project. Areas not found suitable will be substituted by suitable area.
3. Forest clearance was to be done only upto 4 M below FRL

District	Area in hectares diverted for ISP	CA target in Degraded Forest	CA target in non forest area	Total target in ha.
Khandwa	33,383	30,572	2,314	32886
Dewas	4,528	17,491	802	18293
Hoshangabad	3,678	22,739	2,842	25581
Sehore		-	1,247	1,247
Dhar		-	1,001	1,001
Khargone		-	1,937	1,937
Total	<b>41,589</b>	70,802	10,143	80,945
Revised Targets		70,952*	10,452**	

\* Targets revised due to additional works over 150 ha area as penalty.

\*\* Targets revised due to release of additional 308.47 ha of land.

#### **Progress of implementation**

During 40<sup>th</sup> meeting it was pointed out that plantations raised as vegetative measures under CAT have been accounted for against the achievement of compensatory afforestation target also. Thus, the same plantation area has been shown against the achievement of CAT target as well as compensatory afforestation target. This was contrary to the directions of the Environment Sub-group. GoMP was requested to exclude the plantation areas covered under the CAT from the achievement of compensatory afforestation.

The progress reported by GoMP by the end of June 2004 was 78,643 ha (forest area = 68,596 & Non forest area = 10,047 ha). However after deleting the targets covered under CAT programmes balance target works out as 6,943 ha. As per stipulations these areas were required to be planted up by Monsoon of 2005.

#### **(c) COMMAND AREA DEVELOPMENT AND DOWNSTREAM CONSIDERATION**

The project on completion will provide annual irrigation to 1.69 lakh ha. The Command area comprises Forest: 10,055 ha; Grasses and pastures: 10,498ha;



Cultivated land: 142,406ha; Culturable fallow : 8,116 ha; Barren:18,385 ha. As per direction of the Planning Commission, project proposals are required to include the command area development plan also. MoEF clearance of 1987 also required it. The forest clearance stipulated that tree planting should also be done on either side of canal road and foreshore of the reservoir and in the wasteland / vacant lands under the control of the Irrigation Department in the command area. The key conditions attached with the investment clearance were as follows.

- The State shall comply with the conditions as laid down in the O.M.No.3-87/80-IA dated 24.6.1987 and letter No.8/646/84-FC dated 7.10.1987 both issued by the Ministry of Environment and Forest while according the environmental clearance and the approval for diversion of forest lands for this project respectively for this project and ensure completion of Rehabilitation and Resettlement Plan in scheduled time with close monitoring as per requirements of Department of Environment and Forest.
- State will establish adequate network for ground water monitoring in the command within 2 years and the State should submit to Planning Commission the time frame for establishing such network with mile-stone achievements, duly vetted through Central Water Commission, for monitoring the same by Planning Commission
- State should draw up a detailed time schedule for completion within 5 years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area ( Not already submitted) of the total command of this project.
- The State should draw up an implementation schedule segment-wise for completion of canal network, in such a manner that a segment of the canal network, taken up from head reaches, is completed in all respect so as to make the irrigation water available, for the design potential of that segment upto the outlet in that particular segment;

The Government of Madhya Pradesh have submitted command area development plan, delineating the soil classifications and land irrigability in the Narmada Sagar Command Area showing the first three phases of irrigation development by area, the land irrigability map of the Narmada Sagar Command Area during 1986. Accordingly the implementation of the plan was to be taken up in three phases for completion by December-2007. The subgroup directed updating of this plan in line with the plans being developed for the SSP in Gujarat and Rajasthan.

1. The study on impact of Agro chemicals, runoff from fields on surface & ground water quality in the command area was assigned to J.L. Agricultural University, Jabalpur. Results may please be presented
2. However the progress on the canal system is very slow. Earth work has been completed only in the first 28 kms of the main canal and mostly completed in another 13.25km length. Work for most of the distributaries is yet to be started.

#### **Progress of Implementation :**

As informed during the 40<sup>th</sup> meeting a GIS based CAD plan was under preparation

with the help of NIC, MAPCOST and Survey of India and experts from NCA. Preparation of a comprehensive command area development plan was entrusted to MITCON consultants of Pune at estimated cost of about Rs.40.00 lacs. A multi-disciplinary expert group was constituted by the GoMP to supervise and monitor the preparation of this plan. The consultant have already started the work which was likely to be completed by June 2005.

Members may like to review & discuss.

#### (d) **FLORA, FAUNA, & CARRYING CAPACITY**

The submergence of forestland will result in the creation of new and regenerated forest habitat, the establishment and improvement of wildlife sanctuaries, the greater availability of fresh water for irrigated forestry for wildlife. The MOEF conditions for clearance, as far as they related specifically to the Flora & Fauna, were essentially the same as brought under Sardar Sarovar Project.

The objective of the suggested studies was to assess the environmental impacts as a result of the Narmada Sagar Complex, consisting of the three dams: the Narmada Sagar, Maheshwar and Omkareshwar, to ensure minimal adverse effects on wildlife as a result of the project development works. Studies were entrusted to Wildlife Institute of India, Deheradun, Friends of Nature Society, Bhopal, Limnological studies to the Universities (Jabalpur, Ujjain & Bhopal). These institutes carried out studies with a view to address the above concerns and recommended certain mitigation measures ,which included the following.

1. Key aquatic vertebrates species like **otter** was proposed to be restored and translocated. It was suggested to explore the possibility of capturing and translocation of impacted otters of Narmada Sagar into identified localities of the vacant niches in central Indian rivers.
2. Besides, a species restoration plan for **aquatic reptile (turtle)** was also suggested within the submergence zone and also in other stretches of the river with rocky structure and sandy banks.
3. The restoration program for **muggar crocodile** as being practised in other districts of M.P. was also suggested.
4. The studies of certain aspects of fisheries and reservoir sciences have been included in the Limnological studies being conducted by the three Universities of the State.
5. Since the topography in the reservoir area consists of rolling hills, the higher peaks to remain above the water surface level and constitute islands in the reservoir. In addition to these small islands, two large islands will be formed to

the north and south of the Narmada River just upstream of the Indira Sagar Dam. These islands were required to be protected. As per suggestions of the Sub-group NVDA had presented a plan for protection which was required to be implemented.

**A) National Park / Sanctuaries for ISP areas :**

It was suggested that the severity of the impact resulting from direct and indirect losses could be minimised through restoration of some of the aquatic vertebrates and delineation of a substantial area of the contiguity forest which has similar conservation values that are being lost in submergence and to elevate its status to a protected area – a combination of a national park and sanctuary. Three new protected areas were proposed to mitigate the losses. This included Narmada National Park, Suryanmaya Sanctuary and Omkareshwar Sanctuary, as per details given below. It was however informed during the 40<sup>th</sup> meeting that the issue for implementation of the recommendations was under consideration of the State Cabinet.

Name of the Sanctuary/Park	Area in ha.		
	As per WII	As per State committee	
Omkareshwar National Park	47522	25082	- 22440
Suryamanya Sanctuary	16370	17400	+ 1030
Narmada(Mandhata) Sanctuary	11996	6672	- 5324
<b>Total Area</b>	<b>75888</b>	<b>49154</b>	<b>- 26734</b>

Govt. of M.P. vide their letter No. F5/58/83/10/3 dated 29.05.1990, formed a committee for suggesting the steps and drawing up of the plan for conservation & management of wildlife for SSP & ISP both. It was reported by the NVDA that, to ensure that no villages are included inside the proposed area of National Park and Wildlife Sanctuaries, the areas recommended by the EIA report was reduced by about **35.23%**. i.e. instead of covering an area of **75888 ha** recommended by the EIA studies GoMP is willing to constitute protected area only for **49155 ha**. This may have adverse consequences to the conservation of Wildlife.

Members may like to discuss the resulting impacts and consider the issues on merit.

**B) Consideration for commercial fishing activities in the proposed sanctuaries / National Parks.**

During 40<sup>th</sup> meeting of the Environment Sub-group, GoMP requested the Sub-group to consider permitting Govt. of M.P. for fishing related activities like rights of development of fishery, entry, exploitation, transportation in the proposed protected area even after issuance of the notification. The request of the GoMP was based on the facts that once the areas were notified as protected such activities would not be permissible because the areas to be submerged would legally remain forest land covered by the provisions of forest conservation act 1980. The issue was discussed and it was suggested that this proposal be first got examined by the High Level Expert Group on Conservation & Development on Fisheries constituted by the NCA on the advise of the Environment Sub-group for such purposes and simultaneously this proposal may also be submitted to the appropriate field of the MoEF. Members requested more time to respond to the proposal and a copy of the proposal received to this effect was circulated as annexure to the Minutes for perusal of the members. The meeting of the expert group is scheduled during 8<sup>th</sup> of November, 2004. Progress may please be presented by the GoMP for a review by the members.

**C) Protection for the wildlife moving out from the submergence area : Status and manner of felling of trees from the submergence area.**

A plan for felling was also required, to ensure protection to wildlife. GoMP reported that felling was under progress in 300 compartments of forest areas, 407 Khasra from 24 villages besides private areas of 125 villages. It was further reported that by the end of June 2004 all trees in the private areas were felled where out of 25,872 trees from revenue areas 21,249 trees were already removed. However in the forest areas out of 49,27,457 about 641702 nos. of trees were yet to felled. Environmental consequences of this large scale felling were documented to by the wildlife Institute of India in the EIA studies which called for implementation of mitigation measures, commensurate with progressive filling of the reservoir.

Considering the above, the Sub-group during 38<sup>th</sup> meeting held on 10.3.2003 requested GoMP to initiate the process immediately for implementation of the recommendations within five months period, however implementation of the plan is yet awaited. Present position may be reviewed by the Sub-group.

**(e) SEISMICITY AND RIM STABILITY**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. The MOEF conditions for clearance, as far as they related specifically to the Seismicity and rim stability, were essentially the same as brought under Sardar Sarovar Project.

The Narmada Sagar reservoir has a gross capacity of 12,200 million cubic meters, or about 9.9 million acre-feet, by far the largest-capacity reservoir planned in the Narmada River basin. Therefore the issues of Seismicity and the potential for reservoir-induced seismicity (RIS) were required to be attended as per recommendation of the dam safety review panel, Central Water and Power Research Station, (CWPRS) Pune and Indian Meteorological department (IMD), which suggested:

To monitor seismicity during the pre and post-impoundment phases. Network of about five stations each be developed in the Narmada Sagar, Omkareshwar, and Maheshwar areas .

- To record the ground motion intensity and response of the dams for any significant earthquake in the vicinity, installation of three strong motion seismographs at each dam site.
- To record any significant ground motion that occurs during construction, one strong motion instrument near each dam site.

Accordingly, zone a network of 10 seismological observatories with sophisticated instruments was being established. It was proposed to monitor pre and post impoundment seismicity also at these seismic stations to help in assessing the adequacy of seismic parameters adopted for designs. The location of these seismic observatories was as under:

1. Narmada Nagar	2. Omkareshwar (Kothi)	3. Maheshwar	4. Khandwa	5. Indore
6. Barwani	7. Bagli	8. Kannod	9. Hirapur	10. Chhanera

In addition, to monitor local activity in and around Pandhana, one unit at Pandhana in Khandwa has been established The complete package of seismic digital and analog recorders and sensors have been procured and installed at 10 observatories station. Man power has been deployed for day-to-day operations, maintenance and watch and ward of seismic observatories of ISP on contract basis.

It was informed that data was being recorded at all the observatories except at Kannod and for data acquisition and analysis proposals from private agencies such as Indian agent of M.S. Sprengnether Instruments Inc., USA were being invited

Considering that reservoir has been impounded up to an EL 245.13m, out come of the data analysis carried out by the identified institutions for the ISP regarding reservoir induced seismicity during progressive filling of the reservoir may please be presented.

Members may like to discuss and review.

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, specific requirements for the ISP contained in the environment clearance order of GOI were essentially the same as brought out separately under the Sardar Sarovar Project

The Indira Sagar Project would create a 913 km<sup>2</sup> reservoir and shall have , a main canal of about 332 km. and 1,820 km of distributaries. Surveys and investigation of the existing levels of health, information on specific diseases besides implementation of the planned measures in time were required in accordance with the order of clearance.

Three specific diseases namely Malaria, Schistosomiasis, and Filariasis were studied and diseases like leishmaniasis, scabies, etc., were investigated. The geographical reconnaissance study, to identify the potential breeding sites of malaria vector, was suggested. Other key suggestions included

1. Measures to control schistosomiasis should include physical, chemical, and biological means. The biological mitigation measures would include the use of predator species that would eat the secondary host snails.
2. Since the Anopheline mosquito vector has the potential to proliferate in the reservoir, the large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Some experimental resistance of adult mosquitoes to commonly used biocides was noted under laboratory conditions. Thus research to maintain effective biocides was to be continued on long term basis. Land leveling and land filling operations as well as appropriate vegetation clearing are being integrated. Control measures was to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites.

In pursuance the NVDA was required to update and implement the plan on health aspect for ISP. A copy of the plan was received from the NVDA. It covered the

up-stream, dam site, command area and the rehabilitation sites of the Indira Sagar and Omkareshwar projects. The plan estimated to cost Rs.6.49 crores included provisions towards ISP for 30 bedded hospital at Punasa, 1 mobile unit, 29 Sub-Health Centers, 2 Public Health Centers besides strengthening of 6 existing health sub-centers. Provisions for IEC, control of Arthropods, provision of insecticides and surveillance were also incorporated. Observations of the ICMR on the health plan identified gaps in plan. These were annexed with the minutes of the 40<sup>th</sup> meeting.

Status of compliance / implementation of the plan may please be presented, for perusal / observations and review by the members

#### **(g) ARCHAEOLOGY**

In addition the general obligations of the State under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out under the Sardar Sarovar Project

Investigations of the basin revealed that valley was rich in archaeological belongings. A survey of the 254 villages for identification of the archaeological monuments falling within the submergence area was carried out by the State Department of Archaeology and Museum, Bhopal. The current status of monuments is as below.

- 254 villages surveyed for identification of Archaeological monuments coming under submergence.
- 8 Nos. of monuments have been identified which require relocation/ protection.
- 153 statues have already been collected and preserved at Museum at Dewas, Hoshangabad and Khandwa.
- Shiv Mandir Dharikotla has been relocated to Sarlaya R&R site
- Archaeological Survey of India has also resurveyed 167 villages for identification of the monuments of significance.
- Archaeological Survey of India have prepared a plan for protection of monuments coming under the submergence of Narmada Sagar Complex area. According to this plan, the well situated in the midst of north bastion of Joga Fort, a centrally protected monument, will be fully submerged at FRL + 262.10 M. However, this will remain submerged for 2-3 months during monsoon when reservoir might be at FRL. As far as backwater effect is concerned, the temporary rise due to backwater will be about 0.60 M near well, above HFL. Archaeological Survey of India had prepared an estimate of Rs.1.50 crores for construction of a wall to protect the in-take well. It was decided that NVDA will carry out the work through NHDC under supervision / guidance of ASI.

During 40<sup>th</sup> meeting it was informed that NHDC has prepared an estimates of Rs.25.00 lacs for construction protection wall which has been approved by the Archaeological Survey of India and that NHDC was directed to carry out the work latest by Sept. 2004.

Further progress on re-survey being carried out by the ASI, protection of other identified monuments and progress on protection of intake well of the Joga Fort may please be presented for a review by the members.

**(h) ANTHROPOLOGY**

The Narmada Valley can be divided into three physiographic units (1) Western Vindhyas (2) Narmada through West and South and (3) Western Satpuras. Some Indologists place the Narmada-Chambal civilisation of Malwa as a contemporary of Indus civilisation. Navada Toli is a site contemporary to Harappa where evidence of early farming villages were discovered. Findings of a hominoid skull from Hathnora indicated the possibilities of the existence of human bio-cultural remains within the basin. Excavation of the early historic mound in village Khedinama in Hoshangabad district was completed earlier during 1993-94. Ancient tools and artifacts were found. The entire area was scanned by the Anthropological Survey of India under Narmada Salvage Plan and some ancient tools have been found. NVDA has also planned to establish a Center on Religious and Cultural heritage of the Narmada Basin, initial discussions were held with the experts by the NVDA during the meeting convened for the purpose on 11<sup>th</sup> July 2003. Further progress may please be presented.

After detailed studies NVDA prepared a plan for excavation of five sites in District Dewas, Khandwa. As per the information received from the NVDA excavation works on all the five identified mounds was completed by the State Archaeological Department after taking permission from the Archaeological Survey of India.

A report on findings of the excavations may please be presented for a review by the Members.



**Item No. XLII - 4 (197) : SHARING THE COST OF THE TREATMENT OF FREELY DRAINING CRITICALLY ERODED CATCHMENT AREA**  
**Deferred Item No. XLI - 4 (190)**

Catchment area treatment was one of the condition stipulated by the Ministry of Environment and Forest, Government of India while according clearance to SSP. As per NWDT Award, the cost of treatment of degraded areas in the catchment of the project was not charged to the project. Subsequently the Committee of Union Secretaries decided on 3.7.1992, that only the treatment of critically degraded areas which drain directly in the reservoir **(Phase-I)** should be charged to the Project. The cost of treating the freely or indirectly draining area **(Phase-II)** is not to be charged to the project.

The cost of the treatment of directly draining critically degraded catchment area i.e. Phase-I is to be charged to the project and shared by the party states. The proportion in which this cost is to be shared is the issue on which there are divergent views. Discussions on this issue have been held in various meetings of NCA and RCNCA since April, 1989. The matter has been recently discussed in the 12<sup>th</sup> RCNCA meeting held on 9.9.2004 wherein the Govt. of MP desired to discuss the cost sharing aspect of the CAT of phase-II area also as it has direct bearing on the cost sharing aspect of the CAT of phase-I according to them.

Targets and achievements of the treatment of phase-II CAT of SSP is as below :

Phase-II Plan	Area	Achievements
Govt., of Gujarat	657 ha	Completed
Govt., of Maharashtra	77,568 ha	20,861 ha
Govt., of Madhya Pradesh	3,18,118 ha	35,312 ha

It was observed during the 35th ESG meeting that due to decentralization of the funding components of the watershed management schemes and placement of funds at the disposal of the respective State Govts, needed steps should be taken by the States for continued support to the soil and moisture conservation works as envisaged. It was, however, informed that the progress on treatment of Phase-II areas of catchment was very less due to inadequate financial commitment received for treatment of the Phase-II areas. State Govt., therefore, requested for help from the sub-group for obtaining funds for treatment of the Phase-II works.

GOMP has desired that the cost of phase-I and phase-II CAT should not be distinguished from one another and should be charged to the project and shared among the party states in the proportion to be decided by the RCNCA. Alternatively GOMP has proposed that Ministry of Agriculture, GOI should launch a Central sector scheme of soil and moisture conservation in the entire CAT with 100% assistance so that the question of sharing the cost of phase-II to CAT by the party state does not remain an issue. Funding under such scheme should be made directly to NVDA and not through the Agriculture Department of the State Govt. Otherwise the GOMP should be allowed go ahead with the quantum of funding received from GOI without adhering to the time frame envisaged in the action plan for which MOEF is required to modify its clearance orders.

GOMP has requested that the above provision should apply to the sharing of the cost of phase-I & phase-II CAT of SSP and ISP both.

The RCNCA in its 12<sup>th</sup> meeting held on 9.9.2004 has desired that the proposal of GOMP should be discussed by the Environment Sub-group and the NCA and then it should be placed before RCNCA for its consideration.

The members may like discuss and decide.

**Item No. XLII - 5 (198) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS. [Deferred agenda of the previous meeting No.XLI-4(187)]**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

**1. Phase-I Establishment of Silt Monitoring Stations.**

In pursuance to the recommendations of the Environment Sub-group for establishing silt monitoring stations to assess the efficacy of the treatment works Sardar Sarovar Narmada Nigam Ltd., decided to entrust this work to Central Soil & Water Conservation Research & Training Institute, Vasad. Studies carried out by the Space Application Research Centre, Ahmedabad through satellite imagery for the period 1985-86/ 1994/ showed that there was considerable improvement in the conditions of the catchment. Data pertaining to 2002 was got analysed and made available by the SSNNL. During last meeting it was directed that dedicated focused monitoring for assessment of the CAT works is a continuous process and arrangements made for the same should be continued.

- Report on silt monitoring works entrusted to CSR & TI was awaited from Govt. of Gujarat.
- Report on periodical updating of the focused studies carried out for the sub-watersheds already treated, through FSI was awaited from Govt. of Maharashtra.
- GoMP was taking steps for entrusting the studies to CSR & TI. Progress may please be reported by the GoMP.

**2. Phase-II Submission of Catchment Area Treatment Plans and implementation.**

As per the decision of the Govt. of India of July, 1992 State Govts. were required to submit schemes for treatment of critically degraded sub-watershed other than directly draining as Phase-II programme to the funding agencies for completion of work in a time frame to be determined separately. Available progress is presented below for updating by the concerned states.

Phase-II Plan	Area	Achievements
Govt., of Gujarat	657 ha	Completed
Govt., of Maharashtra	77,568 ha	20,861 ha
Govt., of Madhya Pradesh	3,18,118 ha	35,312 ha

It was observed during the 35th meeting that due to decentralization of the funding components of the watershed management schemes and placement of funds at the disposal of the respective State Govts, needed steps should be taken by the States for continued support to the soil moisture conservation works as envisaged. It was however informed that the progress on treatment of Phase-II areas of catchment was very less due to inadequate financial commitment received for treatment of the Phase-II areas. State Govt. therefore requested for help from the sub-group for obtaining funds for treatment of the Phase-II works.

Members may like to discuss & review.

## **B. MONITORING WORKS IN MAHARASHTRA**

1. **Agency for Inter Departmental Coordination for effective implementation of the plans in time and funding of the works on implementation of action plans for mitigation of adverse impacts on environment.**

In pursuance to the recommendations of the Environment Sub-group during 40<sup>th</sup> meeting a series of steps were taken by the Govt. of Maharashtra and Environmental Cell for strengthening Inter Departmental Coordination has been formed.

Similarly steps have also been taken for release of funds for implementation of environment safeguard measures like implementation of plan on health, plan on fisheries, plan on flora & fauna etc.

A copy of the notification & actual release of fund may please be presented by Govt. of Maharashtra.

## **C. SARDAR SAROVAR PROJECT : PUBLICATIONS / SEMINARS ENVIRONMENT MANAGEMENT**

During earlier meetings it was desired that good works being done by the Project Authorities are to be published. Publication brought out by the project authorities were presented and It was informed earlier that the thrust areas have been identified for publishing success stories. Further progress may please be presented.

**D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

In order to frame yard sticks on the cost estimates of the water resources Projects, the Chairman of the Sub-group during earlier meeting desired compilation of the estimates and expenditure incurred on survey, studies and implementation of the suggested safeguard measures for the SSP / ISP. Updating of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level is requested from the Govts. of Gujarat, Madhya Pradesh and Maharashtra.

**Item No. XLII-6(198) : Any other item**

**Date and venue of the next meeting**

# ANNEXURES



## ANNEX - XLII - (1)

## SARDAR SAROVAR NARMADA NIGAM LTD

(A wholly owned undertaking of Government of Gujarat)

S.K. Mohapatra, IAS  
Managing Director

Ref. No. CAD/TECH/ESG/8/P.II/2005 / 106  
7<sup>th</sup> March 2005

To,  
✓ The Member ( E & R )  
Narmada Control Authority  
116-BG, Scheme No. 74-C,  
Vijaynagar,  
INDORE – 452 010  
Madhya Pradesh.

**Sub : Minutes of the 40<sup>th</sup> Meeting of Environment Sub-Group.**

**Ref : (1) Minutes of the 40<sup>th</sup> Meeting of Environment Sub-Group held at New Delhi on 28/06/2004 received vide letter No. Env.-3(40) 2004/ dated 05/08/2004.**  
**(2) This office letter No. CAD/TECH/ESG/8/04/18 dated 23/09/2004.**  
**(3) Minutes of the 41<sup>st</sup> Meeting of Environment Sub-Group held at New Delhi 06/02/2005.**

Dear Sir,

Please refer to my letter dated 23<sup>rd</sup> September 2004 and the discussions of the same in the 41<sup>st</sup> Meeting of the Environment Sub-Group held on 6<sup>th</sup> January 2005.

However, the minutes of the 41<sup>st</sup> meeting do not reflect the original discussions held with respect to my letter dated 23/09/2004; which the minutes are supposed to reflect.

Your attention is drawn on to Item No. "XLI-1(189): Confirmation of the minutes of the 40<sup>th</sup> meeting of the sub-group" and the modified para therein.

I would like to invite your attention to the discussions held on 6<sup>th</sup> January 2005 for the said issue during which it was clearly stated that the CAD plan which contains both measures for irrigation and measures required to prevent negative impact of such irrigation like water logging and salinity was submitted to the sub-group comments were called for and complied with. The manner in which the minutes are written seems to suggest that water is being utilized for irrigation without these measures having been taken. It was reiterated and also supported by other members present, notably representatives of Government of Madhya Pradesh that the original discussion / decision (discussions on 28/06/2004) was not on such lines. The minutes may therefore be amended as follows:

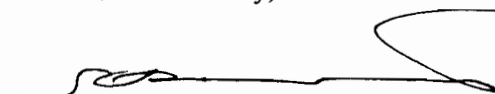


"The Chairman summed up the discussion by saying that water might be drawn from the SSP both for power and irrigation but the implementing state must ensure that all measures as envisaged in the CAD plan are properly implemented so that there is no negative impact of such irrigation."

You are requested to take necessary actions to get the minutes of the 41<sup>st</sup> Meeting modified accordingly.

Thanking you,

Yours faithfully,



**(S.K.MOHAPATRA)**

**Copy for kind information to:-**

- (1) The Secretary (WR) & Chairman  
Narmada Control Authority  
Shram Shakti Bhavan,  
Rafi Marg,  
**NEW DELHI - 110 001.**
- (2) The Chief Secretary  
Government of Maharashtra  
Mantralaya,  
**MUMBAI. (Maharashtra)**
- (3) The Chief Secretary  
Government of Rajasthan  
Secretariat,  
**JAIPUR (Rajasthan)**
- (4) The Chairman  
S.S.N.N.L., Gandhinagar
- (5) The Director (CAD) SSNNL, Gandhinagar
- (6) The Executive Engineer, CAD Wing, SSNNL, Gandhinagar.
- (7) The Deputy Conservator of Forests, SSNNL, Gandhinagar.

**Annex – XLII-(2)****Progress achieved by each state on qualitative parameters of Compensatory Afforestation.**

STATE	Studies on neo ecosystem	Success rate		Transfer to territorial forest divisions
<b>Gujarat</b> As per GOG's letter dated 23.06.04	Report awaited	survival %	Area	Reported to be progressing. But details of notification etc are awaited  Detailed report on development of neo-ecosystem developed in Runn of Kutchch due to plantation efforts is yet awaited from GOG
		Non Forest Area in Kuchchh.4,650 ha.		
		> 50%	50% area	
		30to50%	38% area	
		below 30%	12% area	
		Forest Area (9,300 ha.)		
		Awaited	Awaited	
<b>Maharashtra</b> GOM letter 5 <sup>th</sup> July 1995 & 27 <sup>th</sup> Jan2003	Not relevant	In most of the areas survival > 50% as per information of 1995 and 2003		About 6420 ha. Reportedly notified out of 10,599 ha.
<b>Madhya Pradesh</b> As per GoMP's letter dated 21.06.04	Not relevant	survival %	Area	Out of the 2184 ha plantations on revenue land 1623.782 ha has been notified as protected forest. Remaining area is under process of transfer at different stages
		> 50%	45% area	
		30to50%	5% area	
		below 30%	45% area	
		fodder	5%	

## **ANNEX – XLII ( 3)**

### **Stipulations contained in the order of clearance to the SSP issued by the MoEF related to Command Area Development Plan.**

#### **GOVT. OF GUJARAT:**

Covenants contained in the order of clearances accorded by the Central Government & the status of actions points for implementation of the suggested safeguard measures, arising out of the macro plan submitted by the Govt. of Gujarat.

#### **Covenants :**

- (i) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and In the wasteland/vacant land under the control of the Irrigation Department
- (ii) A programme of drainage and ground water balance studies has been completed for Mahi Narmada-Doab. Such a programme must be completed for the areas beyond the Mahi. The Bhal, Saurashtra, Kutch. Sami-Harij and other areas require this as a pre-condition.
- (iii) The State should set up a special group of experts to study the siltation aspect in the main canals under all operating conditions since such siltation, if occurs, is likely to pose a serious problem during the actual operation of this project and may require a huge expenditure for desilting as well as result into serious operational difficulties.
- (iv) State should draw up a detailed time schedule for completion within five years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area of the total command of this project.
- (v) Past experience of Irrigation projects have revealed that main and branch canals are completed up to the end but, in absence of micro-level networks to take irrigation water up to outlet, corresponding Irrigation benefits do not start accruing In spite of huge financial investment made. To avoid this, the State should draw up an implementation schedule, segment wise, for completion of canal network, in such a way that a segment of the canal network, taken up from head reaches is completed in all respects so as to make the irrigation waters available, for the designed potential of that segment, up to the outlet In that particular segment.

**Annex .XLII-(4)**

**Status of Environmental Safeguard Measures planned by the GoG for implementation pari-passu with the commencement of irrigation, in the areas of SSP Command.**

**A. Irrigation efficiency, water use, prevention of salinity and alkanity, water logging etc.**

Planned measures	Progress	
	Physical	financial
a. Volumetric supply(crop and field demand based water releases) of Narmada water instead as per crop requirement: introduction of automation to assist in water release decision making to ensure that the available water in the reservoir is not unnecessarily diverted and and cause degradation of the environment	Not yet in place	
b. To prevent irrigation-induced land and water degradation and reducing the chances of its misuse and to prevent the gap between the irrigation potential created and the potential utilised, tail enders' problems, water-logging and salinity:- 1. Maintenance of low delta: 2. low water allowance (550 mm/ha), 3. regulation of cropping pattern: changes between the planned and actual cropping pattern	No progress reported	
c. Conjunctive use of ground (saline) and surface water in appropriate ratio.	Progress Nil.	
d. Pre-monsoon and post-monsoon water table scenario : e. Important soil chemical parameters in the crop root zone and of the groundwater	No progress reported	
f. Vertical and horizontal drainage. 1. Increasing drainage density and drainage coefficient for surface drainage 2. Introduction of short duration, low water requiring and salt resistant crops	No progress reported	

g. Land Consolidation, land levelling and in the construction of the low level irrigation and drainage network	Progress is Nil.	
h. Limited use of pesticides / insecticides etc.		
i. Functioning of the village service area (VSA) to ensure a greater participation of the beneficiaries in maintaining the low level irrigation and drainage related infrastructure. 1. A close liaison between the VSAs and the CAD authority 2. The rights and responsibilities of the two are to be clearly defined 3. A mechanism should exist to ensure that these are honoured.	No progress reported	
j. Irrigation related on-farm developmental activities : 1. Training the cultivators on all aspects of on-farm water management 2. Establishment of well managed demonstration farms to motivate them to initiate appropriate action		
k. The measures of continuing nature such as setting up of research centre and farmers' training centre, regular monitoring of water table and soil salinity, monitoring of the impact of introducing irrigation		

**B. Targets and the progress on implementation of environment safeguard measures for the Phase-I of the command. Incremental activities (Physical & Financial) necessitated on account of SSP are to be reported.**

S. No.	Suggested actions	Incremental Planning	Annual Targets		Achievements	
			Phy	Fin.	Phy.	Fin.
1.	<b>Agriculture Development</b> <ul style="list-style-type: none"> <li>Water course and field channel</li> <li>Land leveling and shaping</li> <li>Field drains and chak drains</li> <li>Support and assistance to farms in development of ground water in conjunction with the surface water.</li> <li>Network of approach roads</li> </ul>	1. Subsidy <b>proposed</b> to water users associations 2. Education & training to farmers <b>proposed.</b> 3. Public Sector <b>involvement under considerati</b>				

	<ul style="list-style-type: none"> <li>and eventually farm roads and warehousing.</li> <li>Establishment of agricultural, research-cum-demonstration farms.</li> <li>Co-operatives or farmer-friendly structures for inputs and credit facilities.</li> <li>Provision for supply of seeds, fertilizers, pesticides etc.,</li> <li>Incremental Communication facilities</li> <li>Incremental Municipal &amp; civil facilities</li> <li>Consolidation of land holdings .</li> <li>Agricultural extension activities.</li> <li>Problems areas of Bhal and Bara track.</li> </ul>	<p>on.</p> <p>4. Five Research Stations of State Agricultural Research Universities briefed on the need.</p> <p>5. Command Area requirements included in the syllabus by the Universities for extension training.</p> <p>6. Left to the farmers, only capsules for training.</p> <p>7. Emphasis on creating awareness in the farmers on land consolidation .</p> <p>8. Trend shows less use of chemicals.</p>				
2.	<p><b>Public Health</b></p> <ul style="list-style-type: none"> <li>Strict control on supply of water.(Volumetric supply)</li> <li>Lining of canals</li> <li>Surface drains</li> <li>Drainage of borrow areas.</li> <li>Training at levels</li> <li>Presumptive treatment and</li> <li>Curative treatment               <ul style="list-style-type: none"> <li>NMCP</li> <li>Strengthening of CHCs</li> </ul> </li> <li>Strengthening of PHCs</li> <li>Strengthening of Sub Centers</li> </ul>	Before commencement of Irrigation				
				20 lacs		
				325 lacs		
				420 lacs		
				4 lacs		

	<ul style="list-style-type: none"> <li>Strengthening of Urban Health Services</li> </ul>			6 lacs		
3.	<b>Water quality :</b> <ul style="list-style-type: none"> <li>Water quality monitoring wells.</li> <li>Institutional arrangement for monitoring of surface water quality.</li> <li>Ensuring releases of fresh water for diluting the pollutants.</li> <li>Regulatory control for prevention of downstream environment by Municipal &amp; Industrial sewage.</li> <li>Surface &amp; Sub-surface drainage in region -1 to 4.</li> <li>Regulation for pesticides control.               <ul style="list-style-type: none"> <li>Research Centers for Biological control.</li> </ul> </li> <li>Integrated pest management.</li> </ul>					
4.	<b>Water logging &amp; salinity</b> <ul style="list-style-type: none"> <li>Improving the quality of the soil maps</li> <li>Volumetric supply of water through computerised system</li> <li>Improving the design of drainage system. Re-use plan</li> <li>Ground Water Modelling with new data.</li> <li>Modelling of regions with rocky strata.</li> <li>Operationalisation of the drainage studies</li> <li>Special works on coastal zone.</li> <li>Location of Peizometers / well</li> <li>Integration of GWRDC wells in the command.</li> <li>Institutional mechanism for</li> </ul>					

	monitoring water table / quality. • Legal/Financial frame work for utilization of ground water by the WUA for conjunctive use.(included in the cost estimates of the SSP).					
5.	<b>Downstream Environment</b> • Provisions for complimentary flows for mitigating pollutions in the downstream, • Restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone, • Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality. • Developing of mathematical modeling for prediction of likely impacts of different operational scenarios for mitigation, • Studies on ecology and resources for the downstream environment, narrowing of river channel, • Legal agreement between the party states for regulated releases to ensure that project works as planned.					
6.	<b>Fisheries and Aqua culture :</b> • Linking village tanks to distribution system in about 4,000 ha village pond. And other works from the budget of FFDA and Loan from Bank. • CAD plan on cost of SSP.					
	o Status paper	9.0 lacs				
	o Modification in capacity of ponds	9.0 lacs				
	o Major carp hatchery	15.0 lac				



	<ul style="list-style-type: none"> <li>o Project cells.</li> </ul>	9.0 lacs				
	<ul style="list-style-type: none"> <li>• Control fouling from saline aquifers and agricultural chemicals.</li> </ul>					
	<ul style="list-style-type: none"> <li>• Monitoring responsibilities.</li> </ul>	FFDA				
	<ul style="list-style-type: none"> <li>• Arrangements for analysis of Monitored information</li> </ul>	Commissioner(F)GOG				
7.	<b>Plantations in the command : Existing schemes. (1980-1992)</b>		<b>Annual Targets</b>		<b>Cumulative achievements</b>	
			Phy.	Fin.	Phy.	Finan.
	<ul style="list-style-type: none"> <li>• Strip plantations</li> </ul>	10,304 ha	Departmental work prior to SSP			
	<ul style="list-style-type: none"> <li>• Common lands</li> </ul>	12,213 ha				
	<ul style="list-style-type: none"> <li>• Degraded forests</li> </ul>	5,904 ha				
	<ul style="list-style-type: none"> <li>• Degraded non forest</li> </ul>	460 ha				
	<ul style="list-style-type: none"> <li>• Community forest</li> </ul>	29,000 ha				
	<b>Incremental programme (after SSP)</b>					
	<ul style="list-style-type: none"> <li>• Canal banks</li> </ul>	15,000 ha			3,510 ha	
	<ul style="list-style-type: none"> <li>• Borrow areas</li> </ul>	3,000 ha			Nil	
	<ul style="list-style-type: none"> <li>• Community forest</li> </ul>	40,000 ha			Nil	
	<ul style="list-style-type: none"> <li>• Non culturable land</li> </ul>	40,000 ha			Nil	
	<ul style="list-style-type: none"> <li>• Field bunds</li> </ul>	1,00,000 ha			Nil	
	<ul style="list-style-type: none"> <li>• Farm Forestry</li> </ul>	1,00,000 ha			Nil	
8.	<b>Flora and Fauna:</b> <ul style="list-style-type: none"> <li>• Development of Botanical Garden</li> <li>• Tree Preservation programme</li> <li>• Bio-Diversity Conservation Plan. <ul style="list-style-type: none"> <li>o Environmental stability</li> <li>o Coastal zone Eco-system</li> <li>o Denuded areas in the Command</li> <li>o Increase in tree cover by 5% (outside the forest).</li> <li>o Measures for meeting MFP requirements.</li> <li>o Awareness programme for people's participation</li> </ul> </li> <li>• Incremental Management of Nal Sarovar Environment</li> <li>• Incremental Management Valvador Environment</li> <li>• Incremental Management</li> </ul>	Before commencement of the irrigation in the Command	Nil	Nil	Nil	Nil

	of Wild Ass sanctuary Environment					
9.	<b>Monitoring responsibilities in key areas and related training:</b> <ul style="list-style-type: none"> <li>• Environment such as Fisheries, Health, Ecology, Forestry, Agriculture, Horticulture, Veterinary, Extension Centre, Wild Life, Bio-technology, Soil etc.</li> <li>• Engineering such as Ground Water, Pollution, Salinity, Water Management etc.</li> </ul>					
10.	Arrangement for Data Management (GIS) for Managers of the project in future years.					

**ANNEX - XLII - (5)****FAX NO. 0731-2554333****OFFICE OF THE SUPERINTENDING ENGINEER, NARMADA CANAL  
PROJECT CIRCLE - SANCHORE**

No.:- S.E./N.C.P.C./T-23/2004-05/ 38

Date :- 3.1.05

Dr. Pavan Kumar  
 Director Environment  
 Narmada Control Authority  
 116-BG. Scheme No. 74-C  
 Vijay Nagar, INDORE - 452010

Sub. :- 41<sup>st</sup> meeting of Environment sub group of N.C.A. to be held on  
 6.1.05.

Ref.:- Your letter No. ENV.-3(41)/2004/4771 dt. 3.12.20004 addressed to  
 Additional Chief Engineer, Irrigation Zone, Jodhpur .

Sir,

Kindly refer above cited letter, The overall modified cost of the Narmada Canal Project (Rajasthan portion) is Rs. 1446.88 crore. The provision of Environment & Ecology is Rs. 30.56 crore. This provisions has been phased with effect from 2006-07 to 2009-10. During 2006-07 the overall budget provision on Narmada Canal Project (Rajasthan portion) has been kept as 230.00 crore against which Rs. 9.00 crore has been proposed to be incurred against Environment & Ecology for plantation.

It is submitted that plantation has been proposed in two rows at spacing of 3 m on either side of Canal. The plantation shall be done in the land already acquired for construction of Canal. No separate land for plantation shall be acquired.

The common floral species & commercially important floral species in the project area has been summarized in table 2-6 (at page 2-21) & table 2-8 (page 2-25) of Environment Action Plan. It has been suggested at annexure 5-1-3 under (2) Tree species of Environment Action Plan that a forestation area be planted with locally growing trees like Acacia Nilotica, Prosopis juliflora - Flora, Casuarina equisetifolia, Terminalia arjuna, Prosopis cineraria, Tamarix articulata etc, Eucalyptus camaldulensis & Poplar species of trees have high transpiring capacity & can be planted along with other species.

The likely adverse impact of the project in operation stage have been summarized in para 4.2 of the Executive Summary of the Environment Impact Assessment and Management Plan. Para 4.2.1 gives the impact of water logging. The mitigative measures taken are summarized at page 22 (the text given in italic). The problem of water logging is taken care by providing low intensities of irrigation and crops

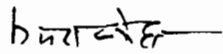
requiring lesser <sup>quantity</sup> ~~quality~~ of water. The mandatory provision of conjunctive use of ground and canal water is introduced in the project in such a manner that the entire groundwater recharge is utilized by irrigation from groundwater.

The mandatory use of pressure irrigation (Sprinkler and drip) will result in a self motivated water conservation measure and consequently low percolation to groundwater.

In view of the above no plantation is required for any bio-drainage method of prevention of water logging in the command. This has been discussed in details in the Detailed Project Report Chapter 7 – Drainage and Conjunctive Use of Water. Copy of para 7.18 of the report is enclosed. This clearly brings out that no plantation is needed for prevention of water logging. If later on a need of plantation is felt in some specific isolated areas, it will be done by the farmers along the field boundaries.

Enclosed :- Two

Yours faithfully


  
Superintending Engineer  
Narmada Canal Project  
Circle – Sanchoe

No.:- S.E./N.C.P.C./T-23/2004-05/

Date :-

Copy submitted / forwarded to the followings for information & necessary action.

1. Mrs. Savita O.S.D. to Secretary Environment, IIIrd floor, S.S.S.O. Bulding, Secret rate Raj. Jaipur.
2. O.S.D. to Secretary Irrigation, Raj. Jaipur.
3. Additional Chief Engineer, Irrigation Zone, Jodhpur.
4. Executive Engineer, Narmada Canal Division I / II, Sanchoe.

  
Superintending Engineer  
Narmada Canal Project  
Circle – Sanchoe

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**Extract from Chapter 7 – Drainage and Conjunctive Use of Water**

**7.18 Conclusion**

As described in the above paras the position of the required drainage in this area is as under

- (i) **Horizontal Drainage:** Horizontal Drainage is not needed. It is a very costly method and the maintenance of the drainage is also difficult. The water so drained out will go waste to the Runn of Kutch and will not be utilized.
- (ii) **Vertical Drainage:** This is proposed in the entire project. The brackish groundwater can be used in conjunction with fresh canal water for irrigation. The total quantity of groundwater recharge including the groundwater percolating as the result of irrigation can be used by this method. The groundwater can be drained by shallow wells. Already a large number of such wells are existing in the flow area. In 'Ned' area the number of wells is less because the groundwater is too saline but the cultivators can be expected to dig more wells. The practice of using irrigation water from dug cum bore wells to the maximum possible extent is prevalent even at present. Thus there would be no financial burden on the project in this method. Conjunctive use of groundwater along with canal water would have to be made mandatory for all water users for which appropriate provisions should be incorporated in the relevant Act and Rules.
- (iii) **Bio Drainage:** Two possible alternatives for bio drainage have been discussed:
  - a. **Bio drainage by planting trees along the canals and along the boundary of the field of cultivators.** As discussed this method itself can take care of the total groundwater re-charge. The plantation along canal system is done as a routine procedure under the head M-Plantation for which provision has been taken in the estimate. Farmers usually plant trees along their field boundaries. All farmers can be made to follow the practice. This work can be done by the farmers themselves, and as explained in para 7.17 cultivators can derive additional benefits from this plantation. The disadvantages are that the trees would compete with crops for the irrigation water applied on the fields and tree shading may affect the crop growth.

It needs to be mentioned that if the conjunctive use of surface and groundwater is adopted to the required extent, tree plantation may not be needed. On the

other hand, tree plantations will draw water, which could otherwise be used for irrigation.

It is suggested that conjunctive use may be tried first. In the event of drawl of groundwater being not sufficient, the water table will start rising. The water table can be monitored carefully and if it is seen that water table is rising, field plantation can be resorted to. The rise of water table is a gradual process and will take a few years to reach to the maximum permissible level of 2 m below the normal surface level. The plants can grow in a period of about 3-4 years. The plantation along the field boundaries can be taken up in areas where rise of water table is observed to match with the rate of rise of the water table.

**b. Bio drainage through plantation of trees in strips**

The plantation of trees in strips has advantages of providing wind breaks, providing habitat to birds and animals and grass which would be available under the trees can be used as fodder. This can also help to improve the ecology and environment.

This method would be quite costly as it involves permanent acquisition of land. The average current cost of land in this area is around Rs. 1.00 lakh per ha. Moreover, the planting and maintenance of the trees will need proper arrangements. The matter was discussed with personnel of the Forest Department and they expressed that they do not have any funds at their disposal at present to take up this plantation as Forest Department activity.

Plantation along field boundaries appears to be simpler and would not involve any cost to the project. As brought out in (a) above, plantation along field boundaries can be taken up as and when required. Plantation along the field boundaries is therefore preferred over the method of strip plantation.

**ANNEX - XLII - (6)****ANNEX – XLII ( 6)****SARDAR SAROVAR PROJECT : FLORA FAUNA & CARRYING CAPACITY****Govt. of Maharashtra :**

No progress is reported as brought out in the table below:

<b>Agency : School of Environmental Sciences, University of Pune:</b>		
	<b>Recommendation</b>	<b>Status of implementation</b>
1.	Management of corridors for shifting of wildlife, several corridors, passing through moderate to good (0>3) vegetation cover.	Routine management by the state forest department. Report on the issue during progressive filling of the reservoir achieved so far may please be presented.
2.	Tree species with high diversity in the region (e.g. Buchanania lanzan) should be conserved on large scale, in the form of multi-region seed banks. Some of these seeds from each variety, should be planted in iso-climate regions, with care, if such regions fall in degraded areas.	Buffer zone plantation in 500 m width around the wetland area of the reservoir awaits implementation
3.	Seed bank of the surface soils from low-lying (e.g. valley bottoms) areas were to be used for developing vegetation (natural) in degraded catchment.	Progress on establishment of seed banks which were to be established with the help of Forest Protection Committees working in the remote tribal areas of the Satpuda ranges, may please be reported.
4.	Conservation of soil on slopes and crests and restore adequate soil cover on undulating grounds, through deposition of soil, restoration of degraded lands, formation and retention of plant cover, improvement of high diversity vegetation cover and soil potential should be exploited and encouraged.	Assured for implementation by the GoM. Progress may please be reported.

**Govt. of Gujarat :**

M.S. University, Vadodara conducted EIA & recommended several measures for preparation of Environmental Management plan for the upstream environment. Key recommendations focused amongst others on the following issues.

- Rehabilitation plan for the identified animals and plants
- An independent monitoring and evaluating infrastructure is an absolute necessity for successful execution of these strategies and action plans.
- To undertake development programmes in rural areas in natural watershed unit.
- Institute rational land use planning,
- Undertake reseedling programmes
- Training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state.

Implementation of the Environment safe guard measures were under progress as brought out below

1. Entire catchment Over 30,000 ha area of Narmada river in Gujarat was treated up by soil moisture conservation measures. This included reforestation over 27204 ha area. A report on other recommendations of the M.S. University, focusing on activities of the joint forest management committees and specific recommendations for the protection and conservation of *Butea monosperma* (yellow variant) and *Radermachera xylocarpa* which were unique and represented important and rare floral element may please be presented.
2. In addition the area of Dhumkal sloth bear sanctuary was enlarged 4 times and now known as Shoolpaneshwar sanctuary. The sanctuary management plan was drawn up and was under implementation. A detailed report on development works under implementation in the Sanctuary areas and on migration of wild animals during progressive filling of the reservoir may please be presented.

#### **Govt., of Madhya Pradesh :**

State Forest Research Institute, Jabalpur carried out the EIA for the areas in Madhya Pradesh and recommended measures for drawing up of the environmental management plan. The key recommendations included the following:

1. Catchment protection work both engineering and biological coupled with joint forest management. Reestablishment of indigenous forest ecosystem and local diversity.
2. Production of fodder through agro-forestry or silvi-pastoral system through management of village wastelands. Production of bamboo through agro-forestry.



3. Using state-of-the-art technology for devising the management plans for the forests under study area with special reference to protection from fire and stringent control of grazing in the development area.
4. Intensive campaign for forestry-cum-environment awareness, peoples participation backed by development legislation should also be launched.
5. Introduction of quick growing exotics in interest of soil stabilization and meeting the requirement of people in short time.
6. 60 islands which will be found in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.
7. The area is stated comparatively scarce in wildlife with no species that was endemic but to provide alternate habitat for the wildlife two sanctuaries namely Mathwad (346.59 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district were proposed.

Govt., of Madhya Pradesh assured to implement the recommendations and following measures were taken up.

1. The catchment area treatment plan covering 125725 ha area is completed. Report on realization of the objectives of the recommendations may please be presented.
2. To cater to increase requirement of timber, fuel-wood etc., social forestry programme at an estimated cost of Rs.5.0945 crores chargeable to SSP (price level of 1999-2000) with escalation of 9% pre annum was approved by the State Wildlife Committee. Progress on implementation is awaited.
3. Joint Forest Management & Social Forestry schemes run by the State Forest Department incorporated involvement of local people. A report on the same may please be presented.
4. Steps taken for declaring the Island being formed during progressive filling of the reservoir as wildlife habitat may please be presented.
5. Studies recommended creation of two wildlife sanctuaries namely Mathwad (34.659 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district. The State Wildlife Committee had not accepted these recommendations during its earlier meeting (July, 2000). However, during its meeting convened recently (November, 2002) reconsidered its decision and recommended creation of Mathwad sanctuary (at an estimated cost of Rs.21.76 crores) as per recommendation of SFRI but instead of Bokrata Sanctuary recommended Kathiwada Sanctuary (at an estimated cost of Rs.13.97 crores) a little away but within the same ecological zone.

GoMP also proposed formulae for sharing of the cost of the development of all the sanctuaries and National parks, proposed to be developed in the basin from ISP to SSP, in the same proportion as agreed for dam and appurtenant works for ISP and SSP.

A proposal in this regard was submitted by the GoMP and was circulated along with minutes of the 40<sup>th</sup> meeting of Env. Sub-group. During this meeting, after some discussions on the issue, it was observed by the Sub-group that it would be pre-mature to discuss creation of these sanctuaries without an EIA report. Members also requested some more time for responding to the proposal.

Members may like to discuss and review the progress on implementation of the environment protection measures in view of the progressive impoundment which has already commenced since 1994.

#### **Aquatic Environment :**

Impoundment in SSP commenced with the closure of construction sluices during Feb 1994. The impoundment has progressed with the attainment of height of E.L. 110.64m resulting in much larger water spread, requiring a number of sequential actions, in accordance with pre & post impoundment action plan suggested by the CICFRI to safeguard the aquatic environment as brought out below.

<b>Requirement by MoEF / Sub-Group</b>	<b>Recommendation by CICFRI</b>	<b>Gujarat</b>	<b>Maharashtra</b>	<b>Madhya Pradesh</b>
Gene pool, if any, likely to be affected.	8 species considered vulnerable	Plan included Measures for vulnerable species like Hilsa ilisha, Macrobrachium rosenbergii etc, taken	Revised plan received shall be put up to the HLEG for review.	Plan to be revised to include measures for vulnerable species like Mahaseer, Rita pavementata etc
Details of wildlife habitat in the region	Breeding and places habitation identified.	Existing plan included aspect		Office of DD (F) established at Barwani, details of works awaited

Measures proposed to rehabilitate endangered species of flora fauna, if any.	Measures for rehabilitation of endangered fauna delineated	Hatcheries established & reservoir was being stocked		To be included in the revised plan , it is awaited.
Assessment of the carrying capacity of the neighboring areas wherein the wildlife would disperse if the scheme were implemented	Certain studies on water quality, prey predator relation, carbon nitrogen ratio etc were suggested	Results of water quality studies upstream, downstream & estuary available with CICFRI & Pollution Control Board were to be compiled.	Studies entrusted to CICFRI likely to be completed by Dec. 2004 and required to be translated into action plan	Limnological studies were completed. Long term hydro biological monitoring was to cover, identified parameters for water quality monitoring. This is expected to be cover in the revised action plan.
Plan for rehabilitation of endangered flora & fauna.	Draft Guidelines are proposed to be finalized during the meeting scheduled to be convened on 8.11.2004 under the Chairmanship of Jt. Secretary, Fisheries, MoA, GoI	Existing plan to be revised	Existing plan to be revised	Existing plan to be revised

**ANNEX – XLII – (7)****KEY COMPONENTS OF THE ACTION PLAN SUGGESTED BY THE  
CICFRI TO SAFEGUARD THE AQUATIC ENVIRONMENT AND PROGRESS.**

Requirement by MoEF / Sub-Group	Recommendation by CICFRI	Gujarat	Maharashtra	Madhya Pradesh
Gene pool, if any, likely to be affected.	8 species considered vulnerable	Plan included Measures for vulnerable species like Hilsa ilisha, Macrobrachium rosenbergii etc, taken	Revised plan received shall be put up to the HLEG for review.	Plan to be revised to include measures for vulnerable species like Mahaseer, Rita pavementata etc
Details of wildlife habitat in the region	Breeding and habitation places identified.	Existing plan this aspect		Office of DD (F) established at Barwani, details of works awaited
Measures proposed to rehabilitate endangered species of flora fauna, if any.	Measures for rehabilitation of endangered fauna delineated	Hatcheries established & reservoir was being stocked		To be included in the revised plan , it is awaited.
Assessment of the carrying capacity of the neighboring areas wherein the wildlife would disperse if the scheme were implemented	Certain studies on water quality, prey predator relation, carbon nitrogen ratio etc were suggested	Results of water quality studies upstream, downstream & estuary available with CICFRI & Pollution Control Board were to be compiled.	Studies entrusted to CICFRI likely to be completed by Dec. 2004 and required to be translated into action plan	Limnological studies were completed. Long term hydro biological monitoring was to cover, identified parameters for water quality monitoring. This is expected to be cover in the revised action plan.
Plan for rehabilitation of endangered flora & fauna.	Draft Guidelines are proposed to be finalized during the meeting scheduled to be convened on 8.11.2004 under the Chairmanship of Jt. Secretary, Fisheries, MoA, Gol	Existing plan to be revised	Existing plan to be revised	Existing plan to be revised

## ANNEX - XLII - (8)

Status of Felling of the Forest trees from the submergence area**Madhya Pradesh**

Districts	Forest Area			Non Forest Area		
	Total No. of trees to be felled	No. of trees felled	Balance	Total No. of Trees	No. of Trees Felled	Balance (No. of trees to be felled)
Jhabua	38,234	38234	Nil	3112	3112	Nil
Dhar	Nil	Nil	Nil	11,296	4380	6,916
Badwani	14,771	14,771	Nil	16,530	15,287	1243

**Maharashtra**

	Akalkua Tehsil		Akrani Tehsil		Total		
	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Submergence Area (ha.)	Progress (ha.)	Balance (ha)
Between 90-100 m	220.14	140.74	232.53	232.53	452.67	373.27	-
Between 100-110 m	239.72	157.10	515.73	14.11	755.45	728.45	27
Between 110 - 110.64m	Areas not marked						Not Available
Between 110-121 m	153.25	Awaited	460.05	Awaited	613.30	Awaited	Awaited
Between 121-134.68m	117.82	Awaited	349.39	Awaited	467.21	Awaited	Awaited

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पर्यावरण उपदल  
ENVIRONMENT SUB-GROUP

बयालीसवीं बैठक का कार्यवृत्त  
Minutes of the 42<sup>nd</sup> Meeting

7 अप्रैल, 2005 को  
पर्यावरण भवन, नई दिल्ली में हुई  
Held at Paryavaran Bhawan, New Delhi on 7<sup>th</sup> April, 2005

नर्मदा नियंत्रण प्राधिकरण  
NARMADA CONTROL AUTHORITY

इन्दौर  
मई, 2005  
Indore  
May, 2005

**MINUTES OF THE 42<sup>nd</sup> MEETING OF ENVIRONMENT SUB-GROUP  
HELD ON 7<sup>th</sup> APRIL, 2005**

**I N D E X**

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**MINUTES OF THE 42<sup>nd</sup> MEETING OF ENVIRONMENT SUB-GROUP**  
**HELD ON 7<sup>th</sup> APRIL, 2005**

The 42<sup>nd</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held on 7<sup>th</sup> April 2005 at Paryavaran Bhawan, CGO Complex, New Delhi, under the Chairmanship of Dr. Prodipto Ghosh, Secretary, Ministry of Environment & Forests (MOEF), Govt. of India.

The Chairman welcomed all the Members and Invitees to the meeting and discussions on the agenda items were taken up thereafter. A list of participants who attended the meeting is enclosed at **Annex-XLII-Min-(1)**.



**Item No.XLII-1(194) : CONFIRMATION OF THE MINUTES OF THE 41<sup>st</sup> MEETING OF THE SUB-GROUP.**

Member (E&R) informed that the GOG vide letter No. CAD/TECH/ESG/8/P-II/2005/106 dated 7<sup>th</sup> March 2005 have requested for modifications of the minutes under item No.XLII-1(194) relating to the Command Area Development. He read out what was re-recorded during the last meeting and the text now suggested by the GOG as brought out in the agenda. He also informed that the GOM vide letter No. NCA/2005/CR19/TC3 dated 4<sup>th</sup> April 2005 have also objected to the re-recorded minutes and requested to revert back what was recorded during the 40<sup>th</sup> meeting of the Environment Sub-Group. The above letter dated 4<sup>th</sup> April 2005 of the GOM and one that of GOG of even No.129 dated 1<sup>st</sup> April 2005 were circulated during the meeting. After hearing the view point of the GOG and GOM, the Chairman stated that the issue raised now by GOM was a new point and the GOM, if so desired, could bring up the issue before the Sub-Group as a separate item. Any afterthought of GOM cannot be incorporated now as a part of the proceedings. The Chairman further stated that the minutes as recorded in the 41<sup>st</sup> meeting were based on the views of the Members during that meeting and do not require any modification now.

The Sub-Group, thereafter confirmed the minutes of the 41<sup>st</sup> meeting of the Sub-Group as circulated vide letter of NCA's letter No.ENV-3(41)/2005/1014-1054 dated 11<sup>th</sup> February, 2005 .

**Item No.XLII-2(195): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

**(A) Action Taken Report on implementation of the environment safeguard measures.**

It was pointed out by expert member Dr. Shekhar Singh and by Prof. S. Ramaseshan that the ATR submitted by the States indicated limited compliance on several issues which may have serious implications later on. Director(Env), Narmada Control Authority informed that the issues related to submergence were required to be addressed before commencement of submergence whereas some other works which were of continuing nature could be allowed to be completed with a different schedule later on. After some discussions the Chairman asked the State Govts. to make efforts to complete the remaining works also well in time.

**(B) Status of Implementation of the Environmental safeguard Measures commensurate with dam height of EL 121.92m and beyond.**

**(a) CATCHMENT AREA TREATMENT**

The Director (Env.), NCA informed that the physical works of CAT as reported by the State Govts. were nearly completed. The assessment of the efficacy/qualitative assessment of the treatment works in Maharashtra & Gujarat was in progress while Govt. of M.P. did not take up this work on the plea that since these works related to Sardar Sarovar and Indira Sagar Projects are already being carried out by Central Water Commission and Forests Survey of India, no useful purpose will be served by taking-up this exercise.

The representative of GOG informed that they have already submitted the report on the qualitative assessment of the physical works for the forest area during 1998 and thereafter during 2001. Further updating was in progress. For the non-forest areas, the work as per suggestions of the Environment Sub-Group had been entrusted to Valsad Centre of the Central Soil Research and Training Institute, Dehradun who have submitted an interim report in 2004-05. Copy of the report submitted by GoG during the meeting is enclosed as **Annex-LXII-Min.2**.

The representative of GOM informed that the Forest Survey of India, Nagpur center was carrying out sub watershed wise assessment of the efficacy of Catchment Area Treatment works in the forest area. However, for the agricultural areas, Central Soil Research and Training Institute has been asked to conduct the studies. The initial estimate of Rs.3 lakhs has also been revised to Rs.16 lakhs. Prof. S. Ramaseshan stated that the areas of the sub-watersheds where the catchment area treatment works could not be taken up due to litigation, possibility should be explored for treating these areas if become available in near future.

The Chairman mentioned that there is definitely a need for assessment of the efficacy of the Catchment Area Treatment works. He mentioned that the data generally available with the Forest Survey of India may be quite old and whatever has been done during the last five years shall not be reflected in the imageries. He mentioned that regular assessment of the areas treated is required and suitable agencies have to be engaged for this work. The qualitative assessment of Catchment Area Treatment works and that of forest cover of the areas treated has to be analysed. The reliance, however, could be placed on aerial photographs, if available for the recent period otherwise there is no way out, but to identify the agencies and get the same.

Chairman also suggested that the field visits to the areas for sample verification of the quality and quantity of the forest cover by associating CCF of MOEF could be organized by NCA within two to three months time and suitable recommendations for engaging agencies towards procurement and analysis of the aerial photograph should be brought out.

#### **(b) COMPENSATORY AFFORESTATION**

The Director (Environment), NCA informed that works on plantations in the forest as well as non-forest areas were nearly completed. Transfer of the afforested areas to the regular territorial divisions and declaration of these areas as forest land was making progress. In that about 80% in Gujarat, 60% in Madhya Pradesh and 80% in Maharashtra were reported to be under final process of

notification. However, updates on rate of survival, composition of species were not being received regularly. As per the last information received, about 45% areas were having survival rates below 30% in Madhya Pradesh. Similarly such areas in Gujarat were 12%. In addition about 38% area in Gujarat and 5% in Madhya Pradesh the survival count was below 50%. A detailed report on the plantations carried out during 1989-90 was also awaited. Report on development of neo-ecosystem in kutch plantation, Gujarat was awaited.

After some discussions, the Chairman directed that the areas where survival rate was poor should be supplemented with casualty replacements, proper maintenance and watch and ward and also adequate provision of funds should be made for the purpose. He further instructed that the committee undertaking field visits should also assess such areas and make suitable recommendations in this regard.

**(c) COMMAND AREA DEVELOPMENT**

**Gujarat**

The Director (Environment), NCA informed that the micro plan for the phase-1 of the Command Area Development has not been made available by the GOG. The measures planned for safeguarding the environment were not in place and the works related to the provisions of botanical gardens, health facilities on farm and off farm developmental works have to be taken up and completed early. The CAD estimates originally prepared by the GOG for Rs.685 crores were also to be revised considering the additionalities that emerged from the completed studies. These were awaited from the GOG.

The CMD, SSNNL mentioned that the command area in Gujarat was very large and measures for each area will be specific due to variations in geology, morphology, sociology and other factors. It was, therefore, not possible to develop the entire area before commencing the irrigation. He pointed out that in most of the areas in Gujarat, water table was at much lower level and that it could take several years from now before any drainage measures would be needed. He elaborated different measures such as lining of the canal, lower delta, volumetric supply of water as key features planned by Govt. of Gujarat for the first time in India to tackle the

problems of water logging, salinity etc. He assured the Sub-Group of the commitment of the Govt. of Gujarat for implementation of all the needed environment safeguard measures as suggested by the Sub-Group from time to time before irrigation.

Prof. Ramaseshan reiterated the point raised by him during earlier meetings of the Sub-Group and stressed that Govt. of Gujarat was required to provide financial and institutional support through well defined policy for ensuring consumptive use and also to assist the farmers to construct field drains which may ultimately empty into drains along with the minors and sub minors.

The Joint Director, Botanical Survey of India stated that to reduce the stress on the natural vegetation, the command area development was expected to include schemes for incremental plantations not only on the canal banks but also on all available vacant land besides agro forestry and establishment of botanical gardens for conservation of flora of the region in accordance with the recommendations. Representative of the Wild Life Institute of India stated that there are several other major issues such as movement of wild Ass across the Rann of kutch which are required to be addressed professionally.

The GoG representative stated that certain variant species of trees which have been suggested for conservation in fact were found in abundance, however ex-situ conservation measures for the identified species were already in place.

The Chairman stated that the ex-situ measures are not always desirable and therefore alternative methods of protection / conservation are required to be considered. He mentioned that the issues raised by Botanical Survey of India / the Wild Life Institute of India are required to be resolved through consultation / discussions before implementation. All the environmental aspects have to be covered and needed safeguards implemented in identified areas. The state governments has to prepare micro level action plans for the purpose. The representatives of the GOG, however mentioned that they were identifying a segment of about 44000 ha of area where they plan to commence irrigation in the

initial stages. He mentioned that they shall be submitting the micro plans for the measures need to be provided in identified segments to the NCA secretariat.

### **Rajasthan**

The Director (Environment), NCA mentioned that the action plan for implementation of the environment safeguard measures received was not in accordance with the directions given by the Sub-Group from time to time and that it required revision.

The Secretary, Environment, Govt. of Rajasthan stated that Rajasthan had adapted appropriate and approved technology for mitigating the negative impacts on environment which included measures like sprinkler irrigation and low delta much lower than that of Govt. of Gujarat and scheme of plantations on the canal banks. Prof. Ramaseshan pointed out that the plan prepared by Rajasthan if implemented as it is, would lead to large scale water logging and salinity in almost the entire command area. He, suggested that a detailed review of the CAD plan of Govt. of Rajasthan needs to be made by the Sub-Group.

The representative of GOR assured that all the suggestions given by the Sub-Group would be considered by the Govt. of Rajasthan.

The Chairman mentioned that the CAD plan submitted by the GOR may have to be revised to include concern of the members of the Sub-Group. He suggested that GOR should resolve the issues through discussions / consultations and arrange a presentation on the issues resolved / revised plan to the Sub-Group in its next meeting.

### **(d) FLORA, FAUNA AND CARRYING CAPACITY**

The Director (Environment), NCA informed that the desired plans for declaration of sanctuaries/national parks/conservation and development of fisheries, flora and fauna, migratory corridors etc for the wildlife moving out from the submergence area for safeguarding the terrestrial and aquatic eco system are

awaited in Maharashtra and Madhya Pradesh though the submergence up to EL-121.92 m is expected this year.

The representative of GOG informed that the implementation of the management plan for development of Shoolpaneshwar sanctuary was making progress. Removal of coppice crop was expected to be completed by the end of April 2005.

The representative of GOM informed that there was substantial progress on felling of trees and it would be possible to complete the felling by June, 2005, but the planned measures for the environmental safeguard like buffer zone plantation could not be taken up actively mainly due to constraint of funds. He further informed that funds have been released only during last week of March and therefore it would be possible to start the works only beginning of April, 2005.

The representative of the NVDA stated that Govt. of Madhya Pradesh had put up a proposal for consideration of the Sub-Group towards sharing the cost of the proposed development and that directions in this regard were awaited from the Sub-Group. It was pointed out by Director (Environment), NCA that detailed EIA report on the proposed creation of the sanctuary/national park directed by the Sub-Group during its last meeting was awaited from Madhya Pradesh.

The Sub-Group discussed the view point of Govt. of Madhya Pradesh in this regard and after some discussions it was suggested by the Chairman that a proper EIA would be necessary before considering the issue raised. This was agreed to by the GOMP.

**(e) SEISMICITY & RIM STABILITY**

The Sub-Group noted the progress and SSNNL was requested to expedite analysis of the data and up gradation of the equipment.

**(f) HEALTH ASPECTS**

The representative of NCA informed that the incremental facilities over and above the normal state budget were required to be provided for to take care of the people on the periphery of the proposed reservoir, at the project site for migrant workers and at newly created R&R sites.

In Gujarat, some progress is reported for the facilities at the dam site and R&R sites, the progress report on provision of such facilities in the command was awaited.

In Madhya Pradesh, the progress on construction of building at new R&R sites has been reported. The report on implementation of the provision of Incremental facilities towards posting of doctors, purchase of medicines/equipments, spray of insecticides etc. for the village on the periphery of the reservoir was awaited.

The representative of Govt. of Maharashtra stated that epidemiological surveillance studies was making progress and report was expected shortly. He further stated that facilities in the impact areas are being created by the State Govts. and are not been charged to the Sardar Sarovar Project. It was pointed out by Director (Env.), NCA that there were discrepancies in the implementation report with that of the plan submitted. The disease surveillance system continued to be weak as only a few diseases were being monitored. The reports received indicated increasing trend in malarial cases.

The Chairman summed up the discussions by saying that, a formal complete plan giving details of the facilities covered under the state plan and incremental facilities necessitated on account of the recommendations of the EIA study group/field visit reports may be prepared by the Govt. of Maharashtra giving the budget provisions. Pari-passu compliance of the various activities be submitted in the next meeting of the Sub-Group by all the concerned states.



**(g) ARCHAEOLOGY & ANTHROPOLOGY**

The Sub-Group noted the progress as brought out in the agenda.

**(h) DOWNSTREAM ENVIRONMENT**

The Director (Environment), NCA pointed out that in the last meeting, the Sub-group has directed for maintaining minimum flows downstream towards the requirements of environmental control and for evolving a mechanism to ensure that the water downstream should never fall below the minimum specified and that it could be monitored hourly. This was awaited. Compliance report on the recommendations of the H.R. Wallingford was also awaited.

The CMD, SSNNL stated that Gujarat was very much concerned with the downstream supplies for use by the people of the townships located on either bank of the river and also for pushing the salinity ingress to prevent salinisation of the drinking water supplies. The Chairman however pointed out that requirement laid down for safeguarding the identified environmental concerns shall also be ensured by the GOG.

The Member (Civil) I/c (E&R) informed that the average of daily downstream releases as recorded by the GOG are being obtained by the Vadodara office of the NCA. He informed that recently on noticing that the spill over the dam got reduced on the last day of March 2005 due to decreased inflows and shut down of the RBPH, the GOG was requested to operate the river sluices to let enough water downstream as per requirement which was promptly attended to by GOG. He however requested Govt. of Gujarat to delegate authority for regulation of reservoir and operation of river sluices to the local Chief Engineer at Kevadia who should take necessary action immediately under such circumstances to avoid any delayed response. The Govt. of Gujarat agreed and assured necessary action in this regard.

The representative of the SSNNL stated that the proposal to amplify the terms of references of the Sardar Sarovar Reservoir Regulation Committee to include monitoring of downstream releases as brought out in the last meeting is acceptable.

However, the possibility of installation of sensors etc. to collect this information through a Real Time Data Acquisition System also needs to be explored by NCA.

Dr. Shekhar Singh referred to the minutes of the last meeting wherein it was considered desirable by the Sub-group to assess the status of compliance with the help of independent experts/agencies or by the group of expert committee under Narmada Control Authority. The Chairman desired that field visits for verification/review of works by the project authorities on the suggested parameters should be taken up by the NCA, as already discussed.

**Item No. XLII-3(196): REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES - INDIRA SAGAR PROJECT**

- (a) **Catchment Area Treatment**  
and  
(b) **Compensatory Afforestation**

The progress reflected in the agenda was noted by the Sub-Group. Chairman desired that a presentation on completion of the pari-passu requirement of safeguard measures for the Indira Sagar Project in relation to construction activities should be presented during its next meeting by GOMP.

The Director (Environment), NCA briefed the Sub-group about status of the physical works reportedly completed by the NVDA. He informed that the treatment of entire Phase-I (except for 2000 ha area) of directly draining watersheds was completed. Similarly the compensatory afforestation was completed except for minor shortfalls necessitated due to additional plantation work to be carried out in the areas subsequently identified for CAT works by the All India Soil & Land Use Survey Organisation, New Delhi.

The Chairman desired that assessment of the efficacy of CAT and CAF works for ISP should also be undertaken in the same manner as was suggested for the Sardar Sarovar Project.

**(c) Command Area Development & Downstream considerations**

The Director (Environment), NCA informed that as per the latest reports received, the construction of canal network and distributaries was slow but preparation of command area development plan was making progress. It was suggested that GOMP's plan should follow the pattern of the plan prepared for the areas in Gujarat and its downstream to the extent relevant for the areas in Madhya Pradesh.

Prof. Ramaseshan expressed that up-dation of mathematical modeling for the ground water (an essential component for the command area development) was a

time consuming process and was required to be dealt professionally. He offered his help and guidance if so required by the project authorities of GOMP.

It was informed by the representative of the NVDA that initial plan submitted during 1986 was being updated on the basis of latest technological advances and directions of the Sub-Group through MITCON Consultant. Inception report has been received recently and project information volume (Database) would be available soon. He informed that while data collection was in progress, mapping part was getting delayed due to delay in clearances required from the Ministry of Defence for the digitization of the relevant maps got prepared through the Survey of India.

After discussions, Chairman agreed to make reference to the Ministry of Defence in this regard and desired that a formal request giving complete details as to what exactly is required from Ministry of Defence should be sent to the Ministry of Environment by the Govt. of Madhya Pradesh.

**(d) Flora, Fauna and Carrying Capacity**

**Terrestrial Environment**

It was informed by the Director (Environment), NCA that according to the communication received from the WLI, copy placed at **Annex-XLII-Min-(3)**, there were problems in preparation of the desired plans for safeguarding terrestrial and aquatic eco system though dam height had already reached to EL 245.13 m.

The representative of the NVDA informed that though Wildlife Institute in their EIA studies have recommended creation of certain parks and sanctuaries, these could not be implemented as it required rehabilitation of certain villages. Therefore to overcome the difficulties Indian Institute of Forest Management (IIFM) was engaged to carry out realistic studies in this regard and plans were prepared by the Govt. of Madhya Pradesh for complying with the recommendations of IIFM, after following due process laid down in the order of clearance. He informed that felling of trees in the submergence area was nearly completed.

The representative of the Wildlife Institute of India stated that except for two villages, all were excluded from the sanctuary development plan in their recommendations, however, Govt. of Madhya Pradesh while instituting another

study have not consulted the Wildlife Institute of India (WLI). She submitted that under the circumstances the studies carried out and efforts made by the WLI would become in-fructuous.

It was pointed out by the representative of the NVDA that WLI was also represented on the committee which approved plan for implementation. Copies of the minutes of the meeting were also sent to the WLI and no comments were received, therefore the concurrence of the WLI was implied.

After some discussions Chairman stated that the issue of extent and quality of the areas requiring declaration of sanctuaries or parks, in terms of the order of clearance was required to be resolved by taking into consideration the views of WLI also on priority for implementation of the recommendations in time.

### **Aquatic Environment**

The representative of the NVDA stated that the issue of carrying out fishing in the areas on the fringes of the reservoir was required to be resolved. Request in this regard was already placed before the Sub-Group during the last meeting. He drew the attention of the Sub-Group on the discussions of the last meeting where it was suggested that the issue might be placed before the high level expert group on fisheries development and conservation and should be put up with their recommendations. It was also suggested that the GOMP may forward their proposal to the concerned Divisions of the MOEF for examination. Accordingly the issue was discussed and it was observed that permitting commercial fishing on fringe areas of the reservoir was outside the mandate of the HLEG and has to be resolved by the MOEF.

It was, however, brought to the notice of Sub-Group that for the similar issues on Sardar Sarovar Project various possibilities including subsistence fisheries by the stake holders was being explored with the help of IIM, Ahmedabad. The IIM, Ahmedabad had discussions with officers of the MOEF, Ministry of Agriculture, NCA and SSNNL recently and that discussions were proposed with Govt. of Madhya Pradesh and Maharashtra on 13<sup>th</sup> April for ascertaining their view points and possible solution might also be applicable for the ISP.

After some discussions on this issue the Chairman suggested that specific proposal of Govt. of Madhya Pradesh is required to be examined by the concerned Divisions of the MOEF from legal considerations. The concept paper being prepared

at the instance of the HLEG after finalisation shall be put up to the Environment Sub-Group. A decision on Indira Sagar can only be suggested thereafter.

**(e) Seismicity and Rim stability**

The progress presented in the agenda was noted by the Sub-group and GOMP was requested to expedite analysis of the data as brought out in the agenda.

**(f) Health Aspects**

The Director (Environment), NCA mentioned that during verification in 2001 by experts under the umbrella of Narmada Control Authority, some deficiencies were observed in implementation of safeguard measures, which needed to be taken care of. The NVDA thereafter have submitted a revised plan for implementation but the progress was not being received in Narmada Control Authority. The Govt. of Madhya Pradesh was requested for submission of the progress report.

**(g) Archaeology**

The progress given in the agenda was noted. It was informed by GOMP that protection work towards north bastion of the Joga fort was completed. GOMP was requested to expedite remaining works related to completion of survey by the ASI.

**(h) Anthropology**

The progress presented was noted and GOMP was requested to expedite submission of the detailed report as brought out in the agenda.

**Item No. XLII- 4 (197) : SHARING OF THE COST OF THE TREATMENT OF  
FREELY DRAINING CRITICALLY ERODED  
CATCHMENT AREAS.**

The Director (Environment), NCA explained that the clearance accorded by the Ministry of Environment & Forests contained conditions related to treatment of critically degraded sub-watersheds (catchment area) only. The delineation of critically degraded area carried out by All India Soil & Land Use Survey Organization, New Delhi indicated that about 28% of the area required treatment. Since the area was large the issue of the extent of area to be treated at the cost of the project cropped up. The issue was finally settled by an order of the Govt. of India dated 8<sup>th</sup> July 1992 and the project authorities were required to treat only those critically degraded sub-watersheds which were directly draining into the reservoir at the cost of Sardar Sarovar Project. The schemes for treatment of balance critically degraded sub-watersheds were also to be prepared by the project authorities and how and where to charge the cost of such treatment was to be decided separately in consultation with the Ministry of Environment & Forests.

It was further informed that there are differences on the manner in which the cost of treatment of directly draining critically degraded catchment area (Phase-I) is required to be shared. Various formulas for sharing the cost were suggested but differences persisted. The issue was taken to the Review Committee of Narmada Control Authority which in turn referred this issue to the Environment Sub-Group for discussion/advice.

The representative of the Govt. of Madhya Pradesh stated that the cost of sharing the CAT works of directly draining sub-watersheds is linked with the treatment cost of balance of the critically degraded sub-watersheds, as the clearance accorded by the MOEF has not distinguished such categories. It was further pointed out that there have been no modifications in the conditions of the order of clearance by the MOEF which required that entire critically degraded sub-watersheds should be treated ahead of impoundment. He expressed inability of Govt. of Madhya Pradesh to comply with these requirements because of resource constraints and said that the cost of both Phase-I Phase-II should be charged to the project and

shared by all the party states. He stressed that this issue is required to be resolved before any consensus could be reached on sharing formula.

The Executive Member, NCA stated that the issue before the RCNCA was for evolving a formula for sharing the cost of critically degraded directly draining sub-watersheds only. He referred to the decision of RCNCA in this regard which called for recommendations of ESG on the manner of sharing the cost of treatment works between the party states.

Prof. S Ramaseshan suggested that the Sub-Group was not the right forum to discuss the issue of sharing of the cost of Catchment Area treatment and may be considered separately.

Keeping in view that the clearance order issued by the MOEF has not distinguished between Phase-I & Phase-II areas and also the view point advanced by the Govt. of Madhya Pradesh, the Chairman directed that all the party states should give their views by 30<sup>th</sup> April positively and thereafter separate discussion with concerned officials of the Planning Commission, Ministry of Environment & Forests could be held before any recommendation was made by the Environment Sub-Group in this regard.



**Item No. XLII- 5 (198) : REVIEW OF THE ACTION TAKEN ON THE DECISION  
OF THE PREVIOUS MEETINGS.**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

- 1. Phase-I Establishment of Silt Monitoring Stations.**
- 2. Phase-II Submission of Catchment Area Treatment Plans and implementation.**

Discussions on these issues were already covered under other Items.

**B. MONITORING WORKS IN MAHARASHTRA**

**Agency for Inter Departmental Coordination for effective implementation of the plans in time and funding of the works on implementation of action plans for mitigation of adverse impacts on environment.**

It was informed by the representative of Govt. of Maharashtra that in pursuance to the recommendations of the Environment Sub-group a series of steps were taken by the Govt. of Maharashtra. Environmental Cell for strengthening Inter Departmental Coordination has accordingly been formed. Funds have also been released and that it would start functioning by 1<sup>st</sup> April 2005.

**C. SARDAR SAROVAR PROJECT: PUBLICATIONS/SEMINARS  
ENVIRONMENT MANAGEMENT**

The Sub-Group noted the progress.

**D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND  
IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

Director (Environment), NCA informed that GOMP has submitted updated estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level. The information is awaited from Gujarat and Maharashtra. The Chairman desired that the concerned States also should submit the same at the earliest.

The meeting ended with a vote of thanks to the Chair.

**ANNEX-XLII-Min-(1)**

**LIST OF PARTICIPANTS OF THE 42<sup>nd</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 7<sup>th</sup> April, 2005 AT PARYAVARAN BHAWAN, NEW DELHI.**

**Ministry of Environment & Forests**

1. Dr. Prodipto Ghosh, Secretary, MOEF, New Delhi
2. Shri R. Chandra Mohan, Joint Secretary, MOEF, New Delhi.
3. Dr. S. Bhowmik, Addl. Director, MOEF, New Delhi

**Ministry of Water Resources.**

- 1) Shri A.D. Bhardwaj, Commissioner (PR), MOWR, New Delhi.
- 2) Shri P. Padmanabhan, Sr. Jt. Commissioner (PR), MOWR, New Delhi.

**Narmada Control Authority**

1. Shri A.C. Gupta, Executive Member, NCA, Indore
2. Shri Jhujhar Singh, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore

**Sardar Sarovar Construction Advisory Committee**

1. Shri Janardhana Babu R. Dy. Secretary, SSCAC, Vadodara

**Ministry of Agriculture**

1. Shri R.K. Tiwari, Asstt. Commissioner (WP), MOA, GOI, New Delhi.

**Botanical Survey of India**

1. Dr. K.P. Singh, Joint Director, B.S.I., Allahabad

**Wildlife Institute of India**

- 1) Dr. Asha Rajvanshi, Professor, WLI, Dehradun.

**Anthropological Survey of India**

1. Dr. A.K. Bhatia, An.S.I., New Delhi

**EXPERT MEMBERS**

1. Dr. Shekhar Singh, Expert Member.
2. Prof. R.K Katti Expert Member, New Delhi.
3. Prof S. Ramashesan Expert Member, New Delhi.
4. Shri B.G. Varghese, Expert Member,

## **GOVERNMENT OF GUJARAT**

1. Shri P.K. Laheri, Chairman/M.D., SSNNL, Gandhinagar.
2. Shri S.J. Desai, Director (Canal), SSNNL.
3. Shri A.S. Bharti, Director (CAD), SSNNL, Gandhinagar
4. Shri Anil B. Mandaviã, Director (C), SSNNL.
5. Dr. A.K. Varshney, Conservator of Forests, SSNNL, G'Nagar..
6. Shri Ashwin Parmar, Spl.(Env.), SSNNL, Gandhinagar
7. Shri Dhimant B. Vyas, Executive Engineer (CAD), SSNNL, Gandhinagar.

## **GOVERNMENT OF MADHYA PRADESH**

1. Shri Ranbir Singh, Addl. Chief Secretary & Vice Chairman, NVDA, Bhopal
2. Shri A.K. Dubey, Member (E&F), NVDA, Bhopal
3. Dr. Kawthekar, Advisor Health, NVDA, Bhopal
4. Shri R.K. Behre, SMS (CAD), NVDA, Bhopal.
5. Shri A.K. Jain, Subject Matter Specialist (Afforestation), NVDA, Bhopal.
6. Shri S.N. Chatterjee, Fisheries Consultant, NVDA
7. Shri V.B. Bhatt, Dy. Manager (Env.) , NHDC, Bhopal
8. Shri V.K. Jain, Exe. Director (T), NHDC.

## **GOVERNMENT OF MAHARASHTRA**

1. Shri Krishna S. Vatsa, Secretary, Relief & Rehabilitation, GoM, Mantralaya, Mumbai.
2. Dr. B.N. Patil, Sc.-II, Environment Department, Govt. of Maharashtra.

## **GOVERNMENT OF RAJASTHAN**

1. Shri Lalit Mehra, Secretary Environment, Govt. of Rajasthan, Jaipur.
2. Shri N.R. Mehta, SE, Narmada Canal Project Circle, Sanchoe, Rajasthan.
3. Shri M.C. Jain, Ex. Engineer, Narmada Canal Div.-I, Sanchoe (Raj.).

**ANNEX - XLII-Min-(2)**

*For official use only*

**Rainfall, Runoff and Sediment yield Measurement in the Catchment Area of  
Sardar Sarovar Project lying within Gujarat**

**INTERIM REPORT**

2004-05



*Sponsored by*  
**Sardar Sarovar Narmada Nigam Limited**  
**Gandhinagar**



**केन्द्रीय मृदा एवं जल संरक्षण अनुसंधान और प्रशिक्षण संस्थान**  
**अनुसंधान केन्द्र, वासद - ३८८३०६, जि: आणंद (गुजरात)**

**Central Soil & Water Conservation Research & Training Institute**  
**Research Centre, Vasad – 388306, Dist: Anand (Gujarat)**

**Project Team**

1. Dr. J. S. Samra	DDG, NRM (ICAR)	Advisor
2. Dr. V. N. Sharda	Director CS&WCR&TI Dehardun	Director
3. Dr. Virendra Kumar	Ex- Head CS&WCR&TI, Research Centre, VASAD	Team Leader (till 31 <sup>st</sup> Oct, 2002)
4. Dr. R. S. Kurothe	Head CS&WCR&TI, Research Centre, VASAD	Team Leader (from 1 <sup>st</sup> Nov.,2002)
5. Dr. D. R. Sena	Scientist 'SS' (Engg.)	Associate
6. Dr. S. P. Tiwari	Sr. Scientist (Soils)	Associate
7. Mr. V. C. Pande	Scientist 'SG' (Econ.)	Associate
8. Dr. H. B. Singh	Pr. Scientist (Agron.)	Associate

**Technical Assistance**

1. Dr. R. M. Samarth	Technical Officer (Soils)
2. Mr. M. J. Baraiya	T-4 (Engineering)
3. Mr. M. H. Vaghela	T-4 (Soils)
4. Mr. D.G. Damor	T-II (Plant Science)
5. Mr. S. K. Ramesh	Lab Attendant

An extensive treatment works in the catchment area of SSP, lying within Gujarat have been taken up by SSNNL authorities. It was felt necessary by the Narmada Control Authority (NCA) to measure the effectiveness of these treatments. In this context SSNNL, Gandhinagar approached Central Soil & Water Conservation Research & Training Institute, Research Centre, Vasad 388 306 and signed MoU on the consultancy project entitled "Rainfall, runoff and Sediment yield measurement in the catchment area of Sardar Sarovar Project lying within Gujarat" in September, 2002.

The study initiated from the rainy season 2004 after construction of weirs, observer's room/shelter and posting of observers at the six gauging sites by the forest department SSNNL authorities as per the terms of reference envisaged in the MoU.

Six representative micro watersheds of Narmada catchment located on both the river banks and spread over in three forest division were identified by the research centre in consultation with forest department for sample studies. Micro watersheds selected for sample studies are presented in table 1.

**Table 1: Micro watersheds selected for the sample study in Sardar Sarovar Catchment.**

Name of the watershed	Range	Division
Ambadungar	Kawant	Vadodara
Padar	Kawant	Vadodara
Gulwani	Gulwani	Kevadia
Gadher	Gulwani	Kevadia
Kokam I	Dediapada	Rajpipla
Kokam II	Dediapada	Rajpipla

#### **BASELINE SURVEY**

##### **Vegetation composition, distribution and diversity**

Vegetation survey was conducted in the permanently fixed randomly selected replicated quadrats of size 10 m X 10 m at top, middle and lower reach of the watershed. Shrubs were counted diagonally opposite 5 m X 5 m and grasses 1 m X 1 m within each quadrat.

##### ***Gulwani***

*Butea monosperma* was the predominant species. The total basal area occupied by trees worked out to be 60 m<sup>2</sup>/ha. Among the tree species, the maximum basal area was occupied by *Dendrocalamus spp*, followed by *Bombax ceiba*, *Morinda tomentose*, *Butea monosperma*, *Tectona grandis* and *Azadirachta indica*, respectively. The top story had good (more than 0.7) closed canopy cover. Except for *Butea monosperma*, the other species had

random distribution. In the under story, the shrub species occupied 0.03 m<sup>2</sup>/ha basal area dominated by *Anogeissus latifolia* and *Acacia catechu*, with majority of the species (more than 60%) having contagious distribution. Survey during post rainy season revealed that the grasses occupied a ground cover of 350 m<sup>2</sup>/ha.

#### **Gadher**

The total basal area covered by trees worked out to be 23.7 m<sup>2</sup>/ha, with predominance of *Tectona grandis* among the species. Among the tree species, the maximum basal area was occupied by *Dendrocalamus spp* followed by *Eleodandron roxberghii*, *Morinda tomentosa* and *Acacia catechu*, respectively. The canopy cover in the top story is good and closed. The overall tree distribution was random to contagious. The shrub species 0.16 m<sup>2</sup>/ha basal area dominated by *Wrightia tinctoria* and *Diospyros melanoxylon*, with majority of the species (more than 70%) having contagious distribution. The grasses occupied a ground cover of 717.6 m<sup>2</sup>/ha.

#### **Kokam I**

The trees occupied 83.5 m<sup>2</sup>/ha basal area, with predominance of *Terminalia tomentosa* (Sadad) and *Tectona grandis* among all species. However, *Asan* (*Bridelia retusa*) occupied maximum (39%) basal area followed by *Kalam* (*Mitragyna parviflora*) (38%). The top canopy cover is good, with distribution being random to contiguous. The shrubs occupied total basal area of 11.2 m<sup>2</sup>/ha, with predominance of *Umb* (*Melia tomentosa*) followed by *Bamboo*. Among the basal area of all the species, *Bamboo* occupied the maximum (42%) followed by *Sadad* (19%) and *Kudi* (*Wrightia tinctoria*) (13%).

#### **Kokam II**

The trees occupied 76.8 m<sup>2</sup>/ha basal area, with predominance of *Sag* and *Sadad* among all species. However, *Kalam* occupied maximum (39%) basal area followed by *Biyo* (16%). The top canopy cover is good, with random distribution of trees. The shrubs occupied total basal area of 54.4 m<sup>2</sup>/ha, with predominance of *Bamboo* followed by *Sadad*. Among the basal area of all the species, *Bamboo* occupied the maximum (42%) followed by *Mokho* (*Schrebera switenoides*) and *Sadad* (10% each).

#### **Ambadungar**

The trees occupied 32.9 m<sup>2</sup>/ha basal area, with predominance of *Kuvadi* among all species. However, *Ohan* occupied maximum (54%) basal area followed by *Odo* (18%) and *Simdo* (16%). The top story has closed and good canopy cover, with distribution being by and large contagious. The shrubs occupied total basal area of 4.26 m<sup>2</sup>/ha, with predominance of *Kudi* followed by *Timru*. Among the basal area of all the species, *Khejadi* occupied the maximum (18%) followed by *Timru* and *Sag* (15% each).

#### **Padar**

The trees occupied 18.7 m<sup>2</sup>/ha basal area, with predominance of *Khakhra* among all species. However, *Dhavad* (*Anogeissus latifolia*) occupied maximum (26%) basal area

followed by *Aladi* (13%) and *Sag* (11.4%). The top canopy cover is medium, with distribution being random to contagious. The shrubs occupied total basal area of 4.2 m<sup>2</sup>/ha, with predominance of *Kakhra* followed by *Dhavad*. Among the basal area of all the species, *Bamboo* occupied the maximum (73%).

#### **Land and Soils Features of the watersheds**

The reconnaissance soil survey conducted revealed that surface features of all the watersheds were almost similar, represented with hilly terrain composed of hills and ridges and folded ridges and dominantly occupied by very shallow to shallow, well to excessively drained soils. Soil depths varied widely and limited at many places in the micro-catchments. They are severely eroded and have significant surface and sub-surface stoniness. Rock outcrops were common in all the watersheds.

Analysis of composite soil samples, collected from surface and sub-surface of each watershed covering top, middle and lower reach of the micro- catchment revealed that, soils of all the micro- watersheds were non – calcareous, neutral in reaction ranged from pH 6.7 to 7.0 at surface and pH 6.8 to 7.3 in sub-surface except Kokam-I which was slightly acidic in nature (pH 6.2). No excessive salinity hazard noticed, in the micro- catchments having EC below 1.0 dSm<sup>-1</sup>.

Soils of all the micro-watersheds were rich in organic carbon content. The average organic carbon content of surface and sub surface soils varied from 0.77% to 0.99 % and 0.57% to 0.93% respectively. Mean available P<sub>2</sub>O<sub>5</sub> content was recorded high (67 and 144 kg/ha) in Padar and Ambadungar, medium (37 to 45 Kg/ha) in case of Gadher, Gulwani and Kokam -II, whereas it was low in case of Kokam-I ( 18 Kg/ha). Available K<sub>2</sub>O content was generally high (304 to 518 kg/ha) in all the catchments under study except Gadher ranked medium with a mean value of 298 kg/ha). Some of the soil physico-chemical properties are given in Table-2.

#### **Watershed survey**

The survey of watersheds for boundaries and drainage channels were carried out using Global Positioning System (GPS). The physiographic details of the six watersheds are given in Table 3.

The drainage maps of the micro-watersheds are illustrated in figures 1 through 6. The areas of the watersheds vary from 1.62 to 77.03 ha. These areas are chosen based on the prevailing land use practices of the watershed. A small watershed of 1.62 ha in Kokam-II was chosen to find out the effect of biotic interferences in the watershed on sediment yield. In this watershed the top of the watershed is used for cultivation of the crops and are the most serious problem in sediment yield patterns.



Figure 1. Drainage Map of Ambadungar watershed

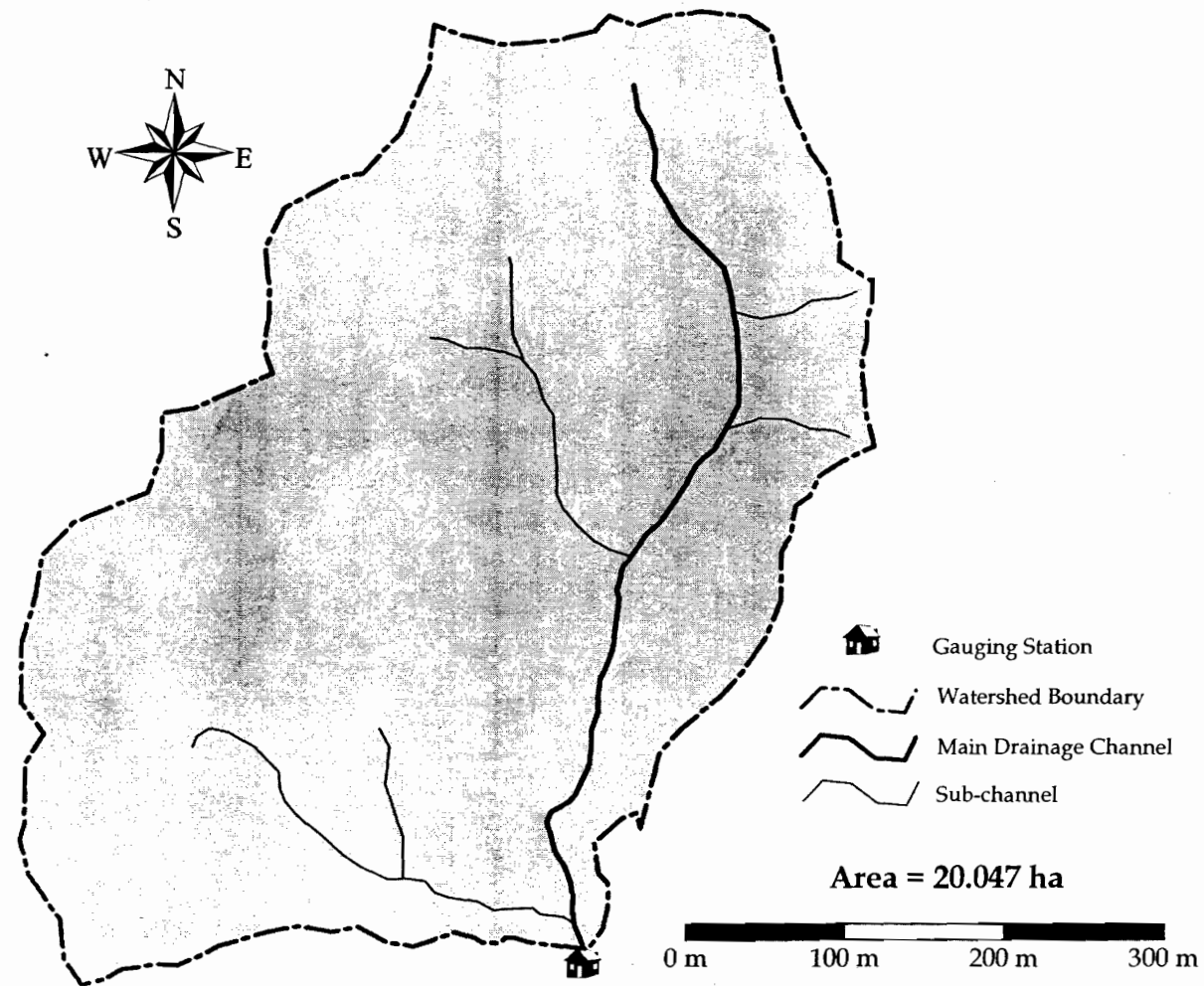
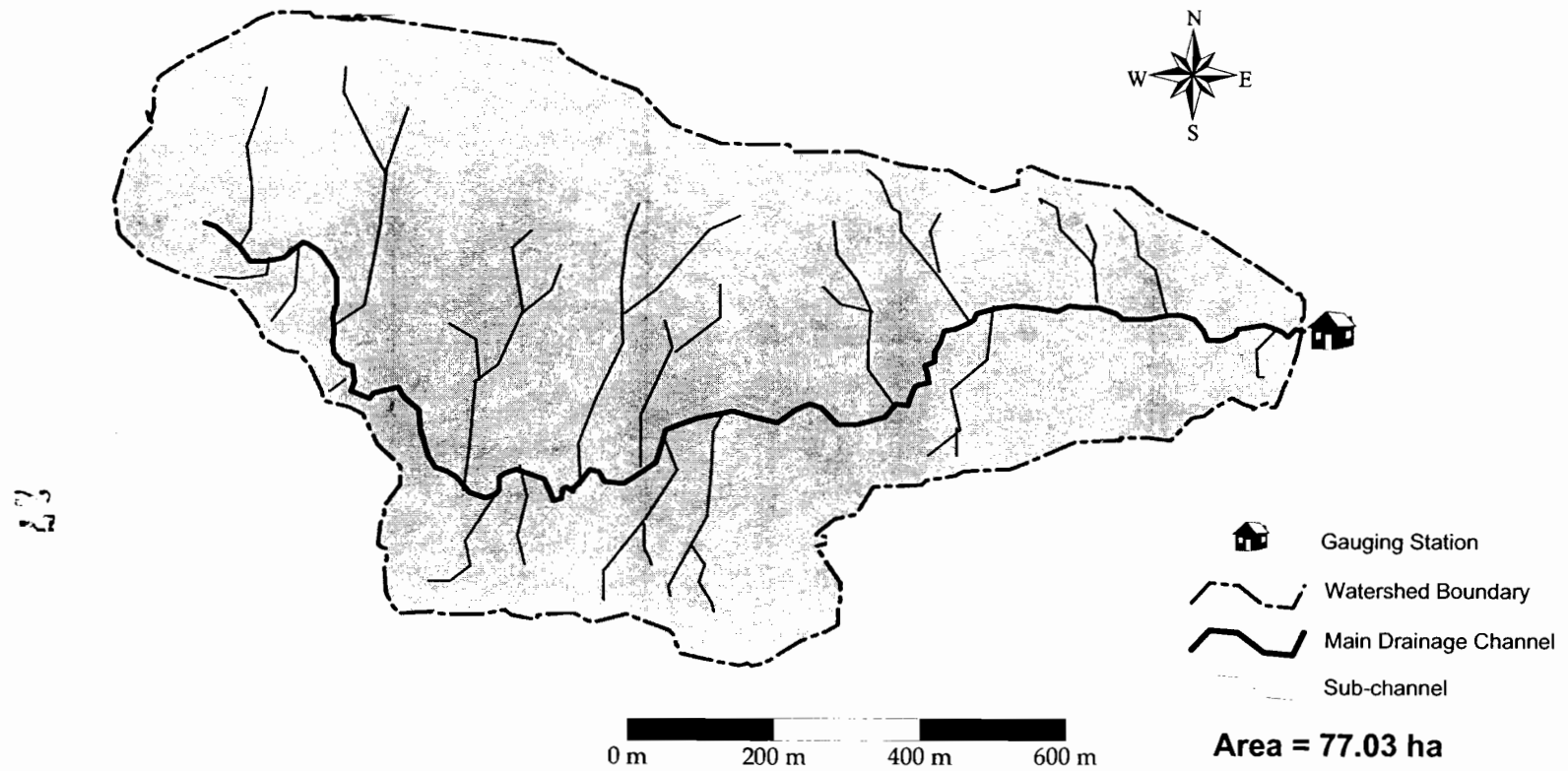
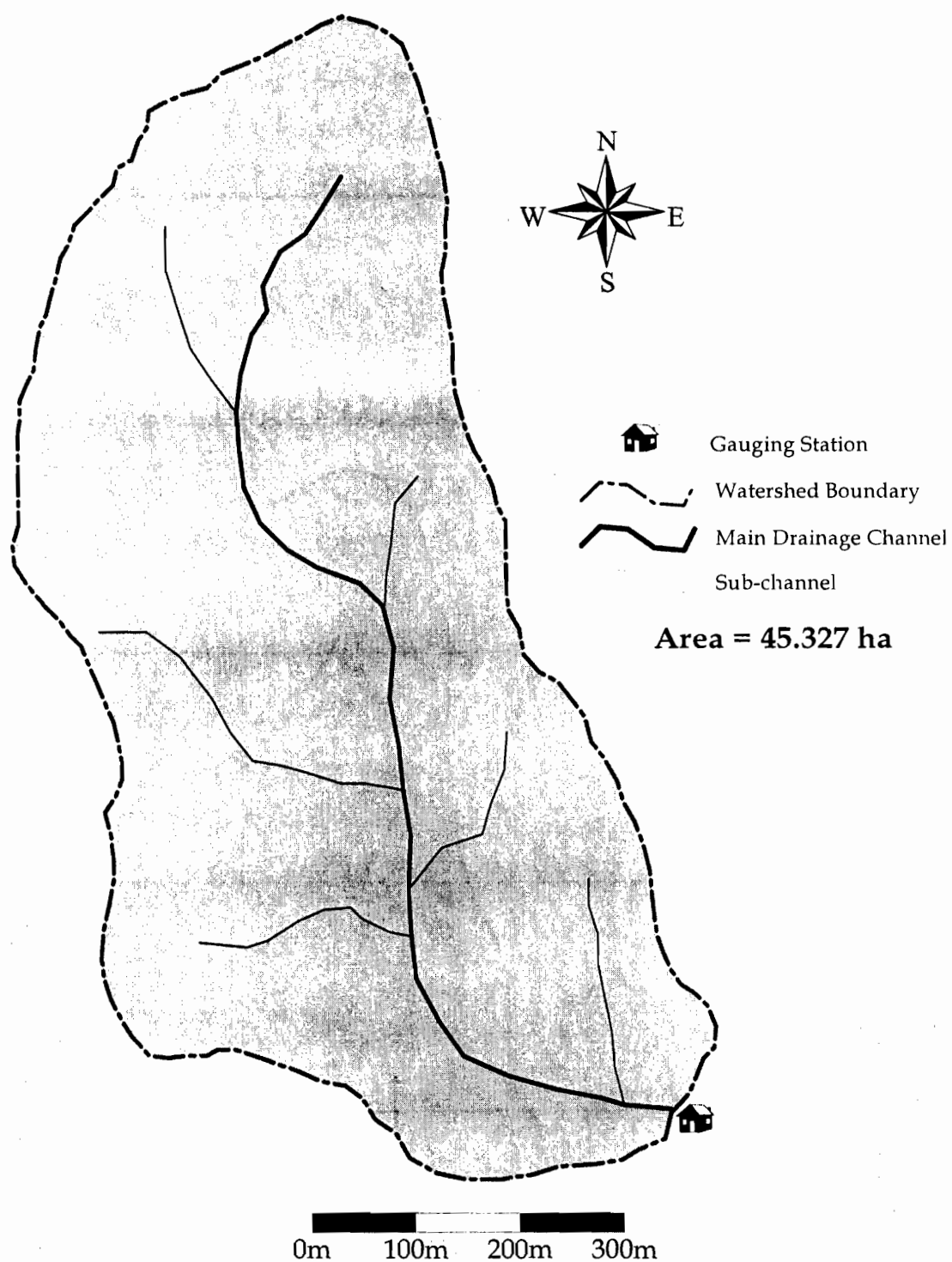


Figure 2. Drainage Map of Padar watershed



# Figure 3. Drainage Map of Kokam-I Watershed



# Figure 4. Drainage Map of Kokam-II Watershed

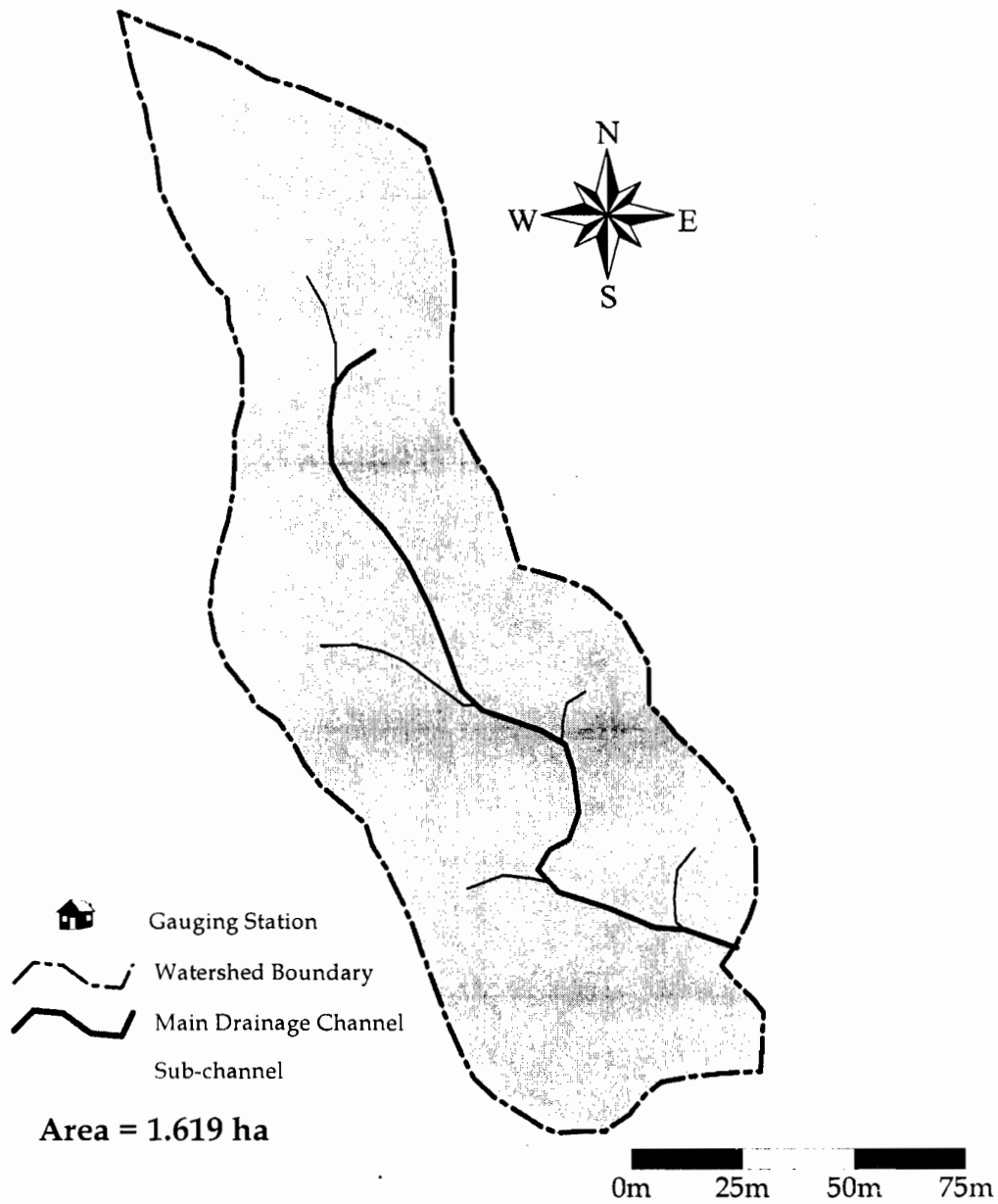


Figure 5. Drainage Map of Gadher watershed

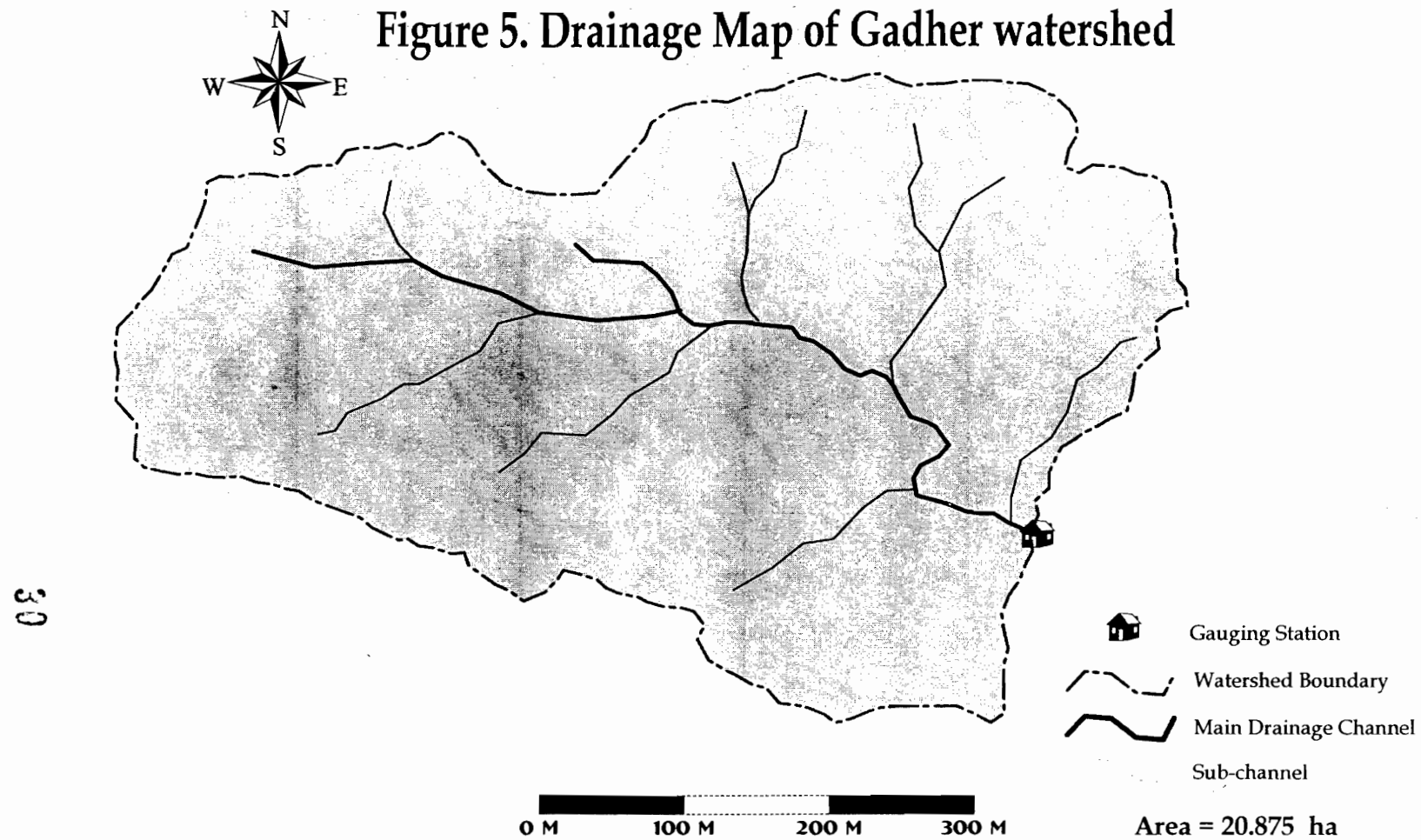
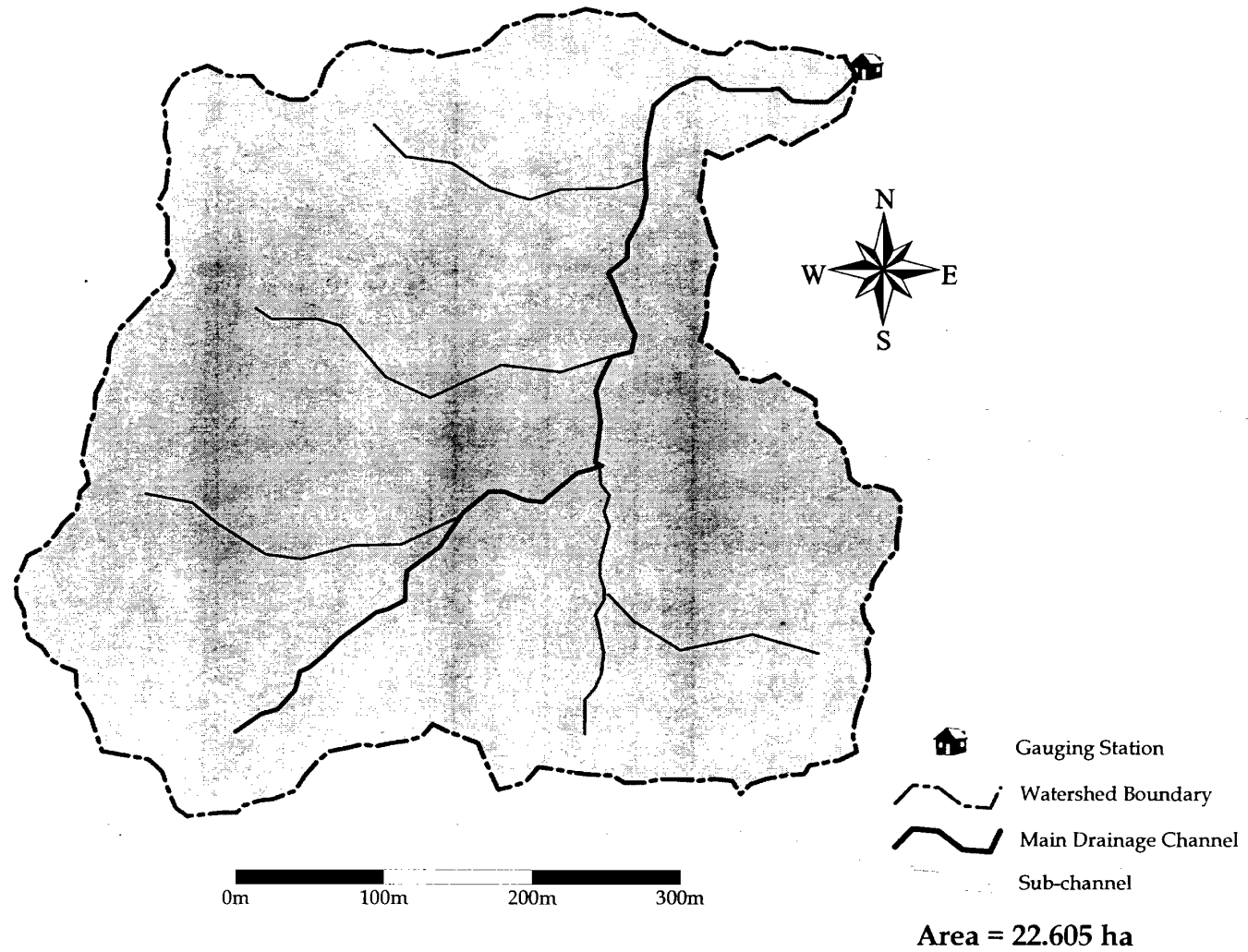


Figure 6. Drainage Map of Gulwani watershed



**Table 2: Soil physico-chemical properties of different micro-catchments.**

Soil Depths	pH (1:2.5)	EC (dS m <sup>-1</sup> )	Org. C (%)	Avail. P <sub>2</sub> O <sub>5</sub> (Kg ha <sup>-1</sup> )	Avail. K <sub>2</sub> O (Kg ha <sup>-1</sup> )
<b>(A) PADAR</b>					
Surface	6.9	0.15	0.95	67	304
Sub- Surface	7.2	0.10	0.75	43	228
<b>(B) AMBADUNGAR</b>					
Surface	6.7	0.13	0.95	144	518
Sub- Surface	6.8	0.11	0.93	137	458
<b>(C) GADHER</b>					
Surface	6.7	0.08	0.77	37	298
Sub- Surface	6.8	0.05	0.57	34	236
<b>(D) GULWANI</b>					
Surface	6.9	0.18	0.84	45	396
Sub- Surface	6.9	0.11	0.72	41	294
<b>(E) KOKAM - I</b>					
Surface	6.2	0.13	0.94	37	486
Sub- Surface	6.3	0.08	0.90	24	428
<b>(F) KOKAM - II</b>					
Surface	7.0	0.23	0.99	18	380
Sub- Surface	7.3	0.17	0.88	14	262

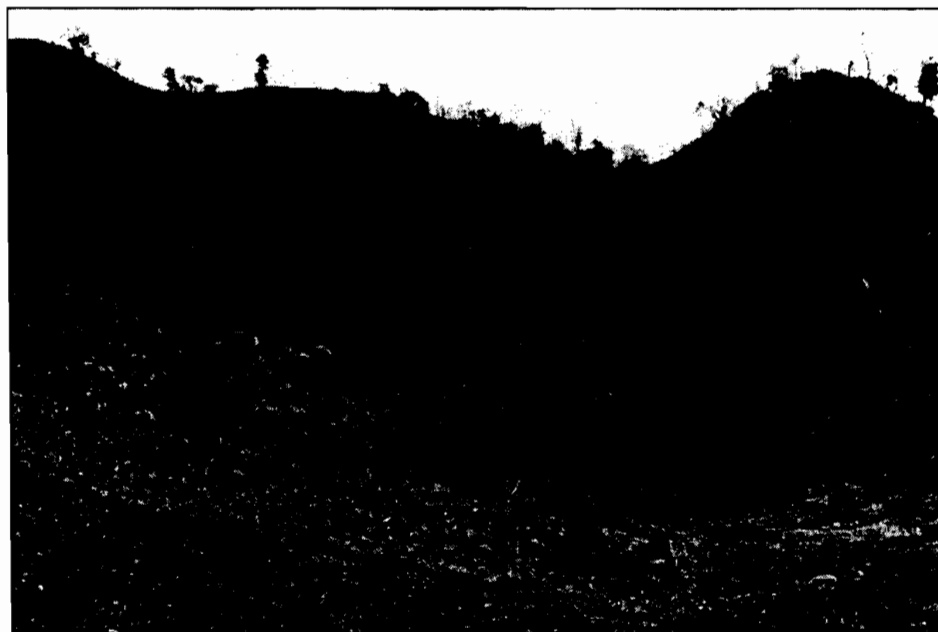
Surface 0-15 cm Sub-surface 15-30 cm

**Table.3. Physiographic details of the micro-watersheds.**

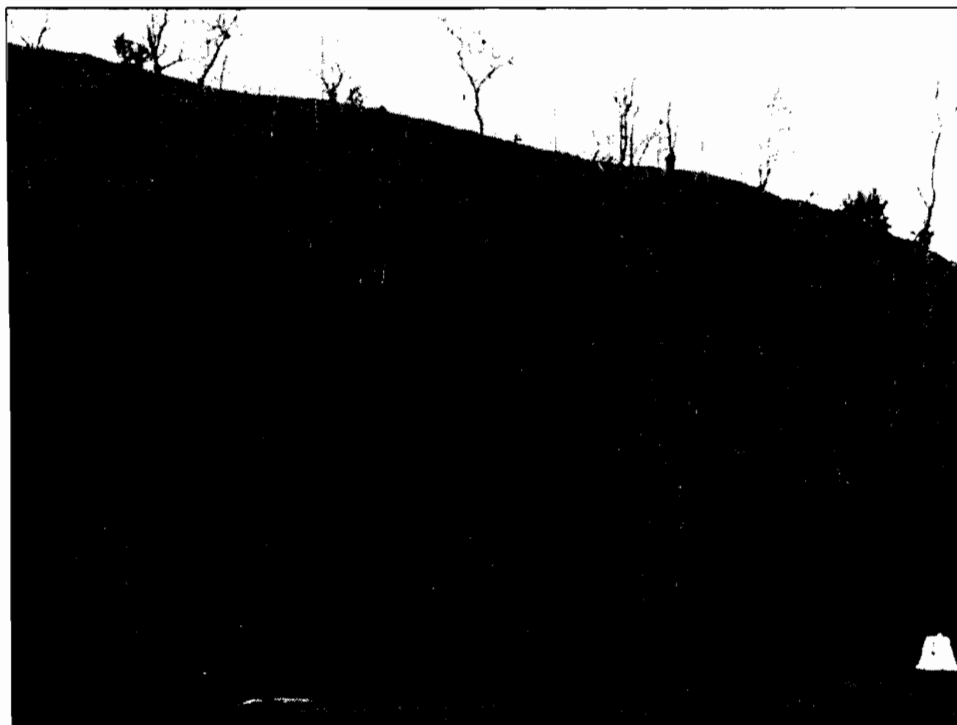
Sl.No.	Name of watershed	Area (ha)	Relief (m)	Latitude	Longitude
1	Ambadungar	20.05	82	21° 59' 17" N	74° 03' 43" E
2	Padar	77.03	180	21° 58' 07" N	74° 07' 09" E
3	Kokam-I	45.33	191	21° 43' 41" N	73° 48' 11" E
4	Kokam-II	1.62	55	21° 44' 10" N	73° 48' 41" E
5	Gulwani	22.07	174	21° 53' 12" N	73° 50' 30" E
6	Gadher	20.88	171	21° 52' 03" N	73° 50' 23" E

#### Installation of Hydrologic Instruments

The installation of rain gauges (One recording and one standard raingauge) were completed at each watershed. The construction of runoff measurement weir along with gauging rooms were also completed by the Forest department at the six micro-watershed sites under the technical supervision of the scientists of the Research centre, Vasad. One day training has been imparted to 18 skilled persons at the research centre, Vasad nominated by the respective forest divisions/ Range. The training was meant for scheduled maintenance of



**Plate 1 . A Panoramic view of the Ambadungar Watershed (13<sup>th</sup> June 2003)**



**Plate 2. A view of the plantation works in Padar Watershed (13<sup>th</sup> June 2003)**



the raingauges and Stage level recorder for runoff measurements at each gauging site along with meticulous procedure for rainfall and runoff and sediment yield data collection.

#### **Collection of Rainfall, Runoff and Sediment yield data**

Rainfall data was collected using both recording and standard rain gauges. The daily continuous record of runoff was made using Stage level recorders (SLRs). Sediment load/ yield data was calculated from sediment samples collected during a scheduled interval during runoff events. The data collected from all six micro-watersheds were analysed.

#### **Rainfall analysis for the six micro-watersheds**

##### ***Monthly rainfall analysis***

Analysis of 2004 rainfall data revealed that, monsoon starts in the month of June and recedes in the month of October (Table 4). The rainfall contribution between July to September varies between 93 to 99 per cent of the total annual rainfall. The maximum rainfall is received in the month of August followed by July and September. The annual rainfalls recorded at the six micro-watersheds are given in Table 4.

##### ***Distribution of daily rainfall***

The analyses of daily rainfall during the year 2004 over an interval of storm depths (Table 5) reveals that the annual rainfall in the six micro-watersheds is received in about 26 to 61 rainy days. Considering the soils of the watershed storms of less than 10 mm rainfall will contribute directly to moisture storage in the soil root zone and storms between 10-25 mm will generate moderate runoff. Rainfall exceeding 50 mm are important from erosion point of view.

#### **Rainfall, Runoff and Sediment Analysis of the six micro-watersheds**

##### ***Ambadungar***

The runoff as a percentage of rainfall for Ambadungar watershed varied from 0.69 % to 44.84 %. The maximum runoff percentage is attributed due to erratic high intensity but short duration rainfall (Table 6). The watershed received 1148 mm rainfall producing sediment yield of about 3.2 t/ha in the year 2004.

##### ***Padar***

A similar trend was also observed from the Padar watershed with total sediment yield of 2.56 t/ha (Table 7). The maximum sediment yield is corresponding to a two days continuous event (2<sup>nd</sup> and 3<sup>rd</sup> August 2004) and is estimated as 1.829 t/ha. The runoff percentage varied from 0.25 % to 11.96 %. The higher percentage of runoff is attributed due to the same reason as discussed earlier in case of Ambadungar watershed. This watershed received 1311 mm of rainfall during 2004.

Table 4. Monthly Rainfall distribution in the watersheds.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Rainfall (mm)
Ambadungar	0.0	0.0	0.0	0.0	0.0	1.0	211.7	982.8	84.3	30.8	0.0	0.0	1148
Padar	0.0	0.0	0.0	0.0	0.0	0.0	177.4	856.4	58.4	55.6	0.0	0.0	1311
Gulwani	0.0	0.0	0.0	0.0	0.0	10.0	356.8	750.6	147.8	30.2	0.0	0.0	1295
Gadher	0.0	0.0	0.0	0.0	0.0	6.8	399.1	742.8	115.4	1.4	0.0	0.0	1266
Kokam-I	0.0	0.0	0.0	0.0	0.0	81.6	526.4	1014.8	143.5	38.6	0.0	0.0	1805
Kokam-II	0.0	0.0	0.0	0.0	0.0	110.6	587.1	1075.0	170.1	22.0	0.0	0.0	1965

Table 5. Daily Rainfall depth(mm) distribution (No. of storm events in an interval) in the watersheds.

Station	Rainfall depth range (mm)									Total rainy days
	0-2.5	2.5-5.0	5.-10	10.-25	25-50	50-100	100-150	150-200	>200	
Ambadungar	10	5	6	17	5	3	2	0	1	39
Padar	12	6	9	11	4	3	2	0	1	36
Gulwani	13	6	13	10	11	3	2	1	0	46
Gadher	24	5	7	11	11	4	1	1	0	26
Kokam-I	16	4	14	15	10	8	2	0	1	55
Kokam-II	19	7	13	18	11	9	1	1	1	61

**Table 6. Runoff and Sediment yield from Ambadungar watershed.**

Date	Rainfall (mm)	Runoff (mm)	% Rainfall (%)	Sediment (t/ha)
02-Aug-04	317.60	142.40*	44.84*	1.8289*
03-Aug-04	12.80			
05-Aug-04	38.40	2.93	7.64	0.0393
08-Aug-04	40.00	2.66	6.65	0.0395
10-Aug-04	119.80	28.04*	23.40*	0.8659*
11-Aug-04	90.50			
13-Aug-04	53.30	0.56	1.04	0.0074
14-Aug-04	140.20	16.00	11.41	0.2144
06-Sep-04	27.80	0.19	0.69	0.0026
20-Sep-04	32.30	12.90	39.93	0.1728
03-Oct-04	16.80	2.25	13.40	0.0302
<b>Total Sediment loss (t/ha)</b>				<b>3.200</b>

\*Combined runoff and sediment due to continuity in the event

**Table 7. Runoff and Sediment yield from Padar watershed.**

Date	Rainfall (mm)	Runoff (mm)	% Rainfall (%)	Sediment (t/ha)
12-Jul-04	22.4	0.06	0.25	0.000
30-Jul-04	66.2	1.16	1.75	0.083
02-Aug-04*	261.3	31.26*	11.96*	1.953*
03-Aug-04*	6.4			
08-Aug-04	28.8	1.72	5.96	0.061
10-Aug-04	136.4	7.70	5.65	0.195
11-Aug-04	108.2	4.60	4.26	0.119
12-Aug-04	57.4	0.98	1.70	0.049
13-Aug-04	93.8	3.32	3.53	0.092
02-Oct-04	49.6	0.31	0.63	0.005
<b>Total Sediment loss (t/ha)</b>				<b>2.557</b>

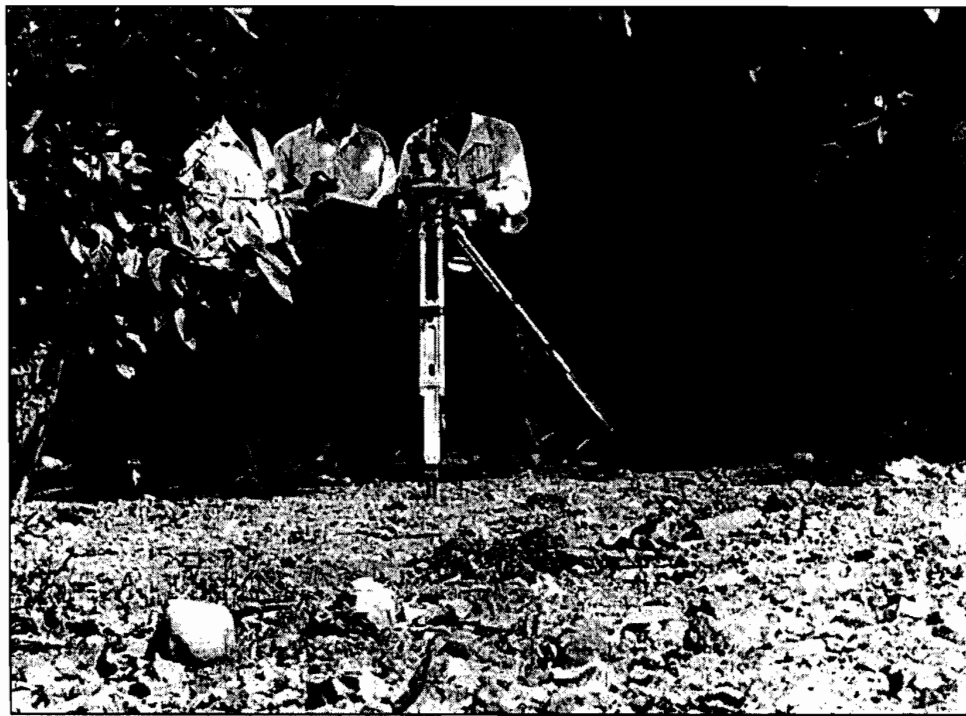
\*Combined runoff and sediment due to continuity in the event

**Kokam - I**

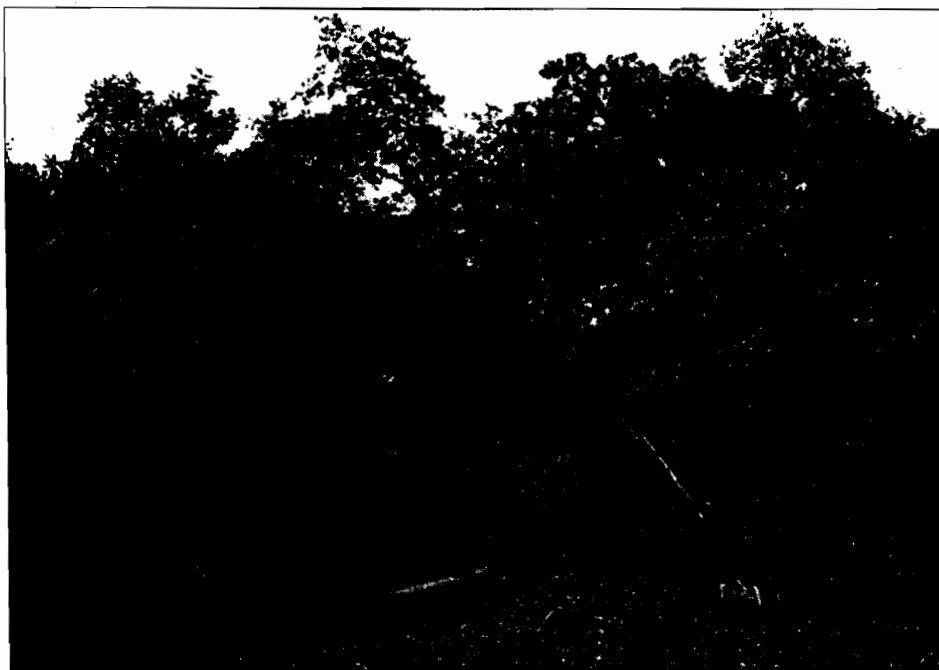
This watershed belongs to a high rainfall zone of the Narmada basin in Gujarat. It received 1805 mm rainfall in 55 rainy days in 2004. However the runoff generation pattern found to reduce over time in a season due to development of tree canopies and grass covers. As a result, during the later period of monsoon more base flow was observed (Plate 3). The sediment yield was found to be as high as 9.13 t/ha due to continuous and larger storm events received this year (Table 8).



**Plate 3. Triangular weir for Runoff measurement at Kokam-I Watershed.**



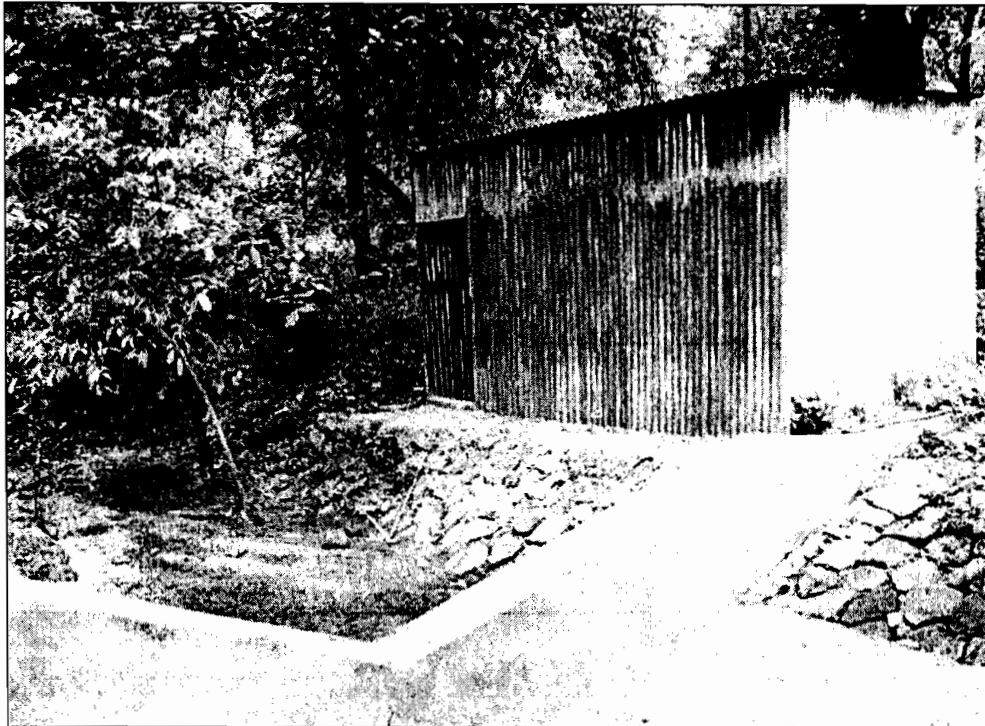
**Plate 4. A view of longitudinal and sectional survey of channel at Padar Watershed.**



**Plate 5. The fully stabilized Gulwani watershed (also seen triangular weir for runoff measurement)**



**Plate 6. The survey party from CS&WCR&TI, Research Centre, Vasad along with the local observers are on their way to Gadher watershed.**



**Plate 7. Triangular weir and gauging room at Kokam-II watershed.**



**Plate 8. Rich coverage of forest canopy at Gadher watershed.**



**Plate 9. Soil sampling by the CS&WCR&TI, Scientist and the observers in Padar watershed.**



**Plate 10. Learning by doing ! The observers at the watershed checking the self recording rain gauge.**

**Table 8. Runoff and Sediment yield from Kokam-I watershed.**

Date	Rainfall (mm)	Runoff (mm)	% Rainfall (%)	Sediment (t/ha)
16-Jun-04	36.60	4.31	11.8	0.631
18-Jun-04	36.80	6.77	18.4	0.187
12-Jul-04	69.20	7.89	11.4	1.768
18-Jul-04	21.40	0.25	1.2	0.000
21-Jul-04	52.20	6.33	12.1	0.120
23-Jul-04	23.60	3.90	16.5	0.137
25-Jul-04	47.20	5.53	11.7	1.354
29-Jul-04	135.20	13.07	9.7	0.315
30-Jul-04	74.40	5.75	7.7	0.250
1-Aug-04	74.20	4.57	6.2	0.126
2-Aug-04	250.40	15.38	6.1	0.073
3-Aug-04	16.60	2.21	13.3	0.099
4-Aug-04	2.60	0.09	3.4	0.000
5-Aug-04	74.80	0.59	0.8	0.015
6-Aug-04	25.80	1.49	5.8	0.148
7-Aug-04	21.20	0.46	2.2	0.007
8-Aug-04	57.800	10.252	17.7	0.049
9-Aug-04	36.60	5.53	15.1	0.020
10-Aug-04	57.00	7.50	13.2	1.068
11-Aug-04	83.00	1.17	1.4	0.030
12-Aug-04	32.40	0.87	2.7	0.152
13-Aug-04	119.40	8.76	7.3	1.984
14-Aug-04	31.00	1.03	3.3	0.075
19-Aug-04	23.00	1.43	6.2	0.087
24-Aug-04	14.40	1.13	7.8	0.153
16-Sep-04	14.40	0.03	0.2	0.000
20-Sep-04	38.20	2.85	7.5	0.285
27-Sep-04	8.20	0.06	0.7	0.001
<b>Total Sediment loss (t/ha)</b>				<b>9.13</b>

*\*Combined runoff and sediment due to continuity in the event*

### **Koakm -II**

This is the smallest watershed (1.62 ha) out of the six micro-watersheds. The watershed received 1965 mm rainfall which produced 73.34 t/ha sediment in 2004 (Table 9). As seen from the table the percentage of rainfall converted into runoff is very high. A typical runoff hydrograph of continuous events is given in Figure 7. The collected runoff samples had very high sediment concentration. This watershed was chosen to find out the effect of biotic interferences on sediment yield. The other man made problem is the road side erosion that really contributes to sediment yield. The upper portion of the watershed is cultivated by the local tribal and is devoid of vegetation during the initial high intensity storms that carries heavy load of sediment. This watershed is also representative of the sediment producing portion of the bigger watersheds. There is no scope of deposition in such watersheds.



Therefore, to reduce the sediment from such portions illegal cultivations may be stopped. If this is not possible then, forest department/ SSNNL may take up intensive soil & water conservation works in such watersheds.

**Table 9. Runoff and Sediment yield from Kokam-II watershed.**

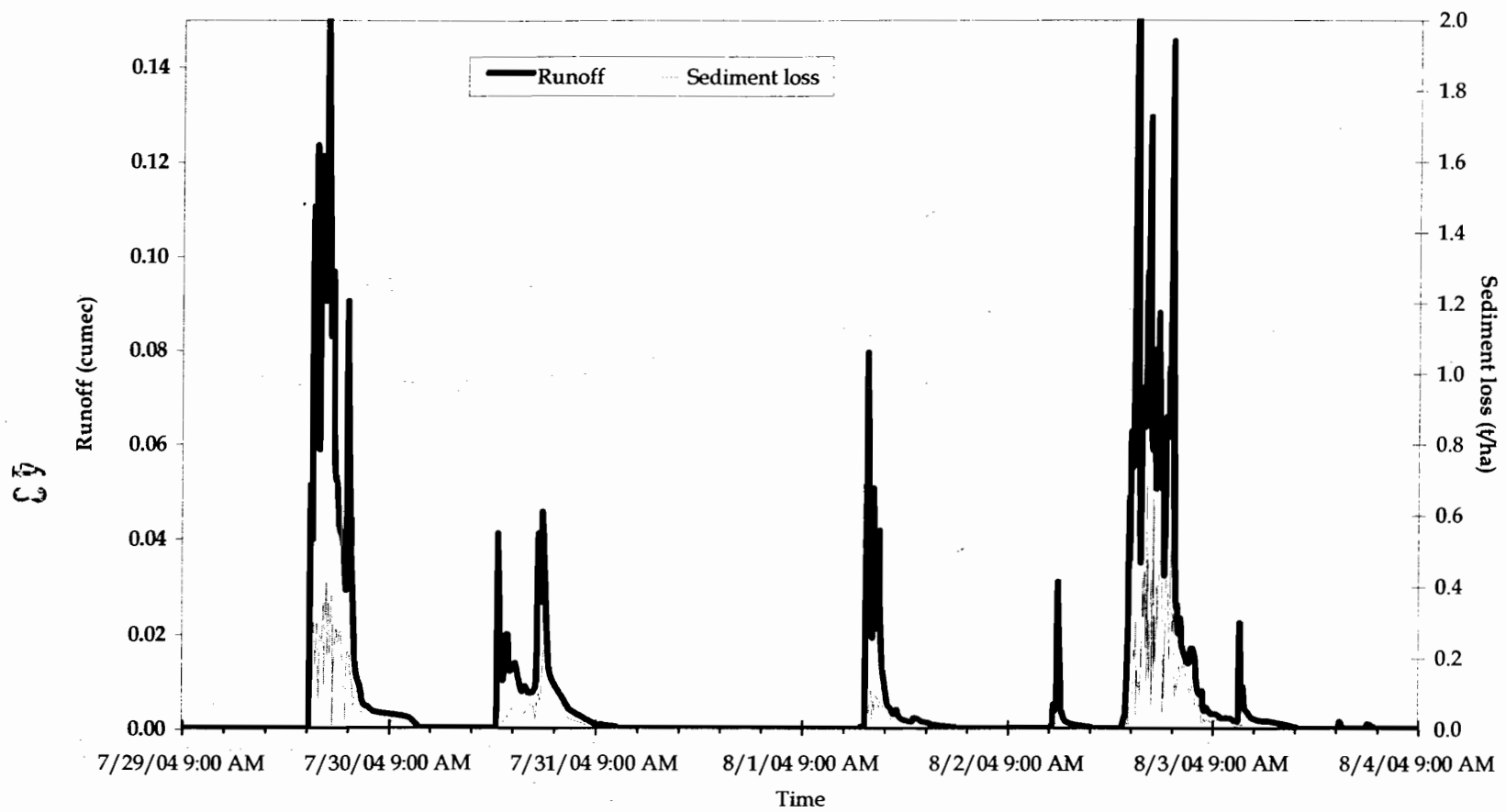
Date	Rainfall (mm)	Runoff (mm)	% Rainfall (%)	Sediment (t/ha)
16-Jun-04	33.500	11.584	34.580	0.321
18-Jun-04	42.200	21.218	50.280	0.761
12-Jul-04	67.200	20.712	30.821	12.701
21-Jul-04	52.600	13.170	25.038	0.470
22-Jul-04				
23-Jul-04	37.200*	12.820*	34.462*	0.608*
26-Jul-04	54.600	16.440	30.110	0.755
27-Jul-04	34.600	17.180	49.653	0.264
29-Jul-04	157.200	87.970	55.961	7.909
30-Jul-04	73.600	27.980	38.016	1.850
1-Aug-04	78.400	19.160	24.439	1.642
2-Aug-04	234.600	103.910	44.292	16.720
3-Aug-04	25.400	5.730	22.559	0.350
5-Aug-04	74.200	21.840	29.434	3.280
6-Aug-04	24.200	6.690	27.645	0.750
7-Aug-04	23.000	1.820	7.913	0.180
8-Aug-04	54.200	2.089	3.854	0.086
9-Aug-04	39.100	9.029	23.092	0.439
10-Aug-04	59.400	26.630	44.832	2.807
11-Aug-04	94.200	48.820	51.826	10.349
12-Aug-04	37.000	26.585	71.851	0.967
13-Aug-04	140.200	55.385	39.504	8.253
14-Aug-04	31.600	7.798	24.677	0.756
15-Aug-04	7.800	0.053	0.685	0.000
18-Aug-04	7.200	0.000	0.000	0.000
19-Aug-04	24.600	6.863	27.898	0.408
22-Aug-04	17.800	0.547	3.073	0.000
24-Aug-04	12.600	1.563	12.405	0.000
25-Aug-04	16.800	0.988	5.881	0.041
11-Sep-04	43.600	7.198	16.509	0.079
16-Sep-04	13.800	2.092	15.159	0.059
20-Sep-04	42.600	5.536	12.995	0.537
<b>Total Sediment loss (t/ha)</b>				<b>73.344</b>

\* Combined runoff and sediment due to continuity in the event

#### **Gadher**

Gadher is the most stable watershed out of the six watersheds with number of loose boulder check dams and better plantation activities. During 2004, only 1.56 t/ha of sediment was generated from 1266 mm rainfall in 26 rainy days (Table 10). The percentages of rainfall converted to runoff vary from 1.15 to a highest of 34.37 (The highest storm of 191.8 mm).

Fig. 7. Runoff and Sediment hydrographs for Kokam-II Watershed



**Table 10. Runoff and Sediment yield from Gadher watershed.**

Date	Rainfall (mm)	Runoff (mm)	% Rainfall (%)	Sediment (t/ha)
29-Jul-04	95.60	11.52	12.05	0.10
30-Jul-04	91.60	1.05	1.15	0.00
2-Aug-04	191.80	65.93	34.37	0.86
5-Aug-04	68.00	4.60	6.76	0.07
10-Aug-04	80.70	4.54	5.62	0.06
13-Aug-04	119.80	11.32	9.45	0.15
23-Sep-04	26.80	3.59	13.38	0.14
26-Sep-04	22.00	2.09	9.50	0.16
29-Sep-04	21.80	2.09	9.59	0.02
<b>Total Sediment loss (t/ha)</b>				<b>1.56</b>

**Gulwani**

Gulwani watershed covers an area of 22.07 ha. Table 11 shows the rainfall, runoff and sediment yield pattern of this watershed. The watershed is also stabilized and produced 2.05 t/ha of sediment from 1295 mm rainfall in 2004 received in 46 rainy days. Though the runoff percentage was high, the sediment concentration in the runoff water was low due to better canopy cover and SWC works.

**Table 11. Runoff and Sediment yield from Gulwani watershed.**

Date	Rainfall (mm)	Runoff (mm)	% Rainfall (%)	Sediment (t/ha)
29-Jul-04	72.80	7.18	9.86	0.075
30-Jul-04	102.20	34.91	34.15	0.291
31-Jul-04	11.80	4.65	39.38	0.044
1-Aug-04	19.60	0.81	4.15	0.005
2-Aug-04	137.40	57.44	41.80	0.392
5-Aug-04	85.40	20.24	23.70	0.173
10-Aug-04	75.00	14.20	18.94	0.137
11-Aug-04	47.20	2.31	4.90	0.067
13-Aug-04	164.20	79.32	48.31	0.521
23-Sep-04	47.60	1.57	3.29	0.120
26-Sep-04	27.00	3.29	12.19	0.019
29-Sep-04	17.80	1.91	10.76	0.085
2-Oct-04	25.00	1.61	6.45	0.121
<b>Total Sediment loss (t/ha)</b>				<b>2.050</b>

This was the first year of recording the data. The observers have done a very good job. However, there were number of missing records of few events. These events were extrapolated from the observed trends. In coming years, the observers will be asked to be extra alert, so that no events are missed.

All the concerned officers of the SSNNL have provided required help during the period of the project. The staff of the centre thankfully acknowledges their help rendered in the project. The support provided by the forest wing of SSNNL in recording and management of gauging stations is also thankfully acknowledged.



भारतीय वन्यजीव संस्थान  
Wildlife Institute of India

No. WII-MEETING-NCA-04

7<sup>th</sup> December, 2004

To,

Shri Suresh Chand  
Member Secretary  
Environment Sub-Group  
Narmada Control Authority (NCA),  
116-BG Scheme No. 74-C,  
Vijay Nagar  
INDORE-452 010

Fax: 0731-2554333

Sub.: 41<sup>st</sup> Meeting of Environment Sub- Group NCA -reg.Ref.: Your letter No. Env. 3(41)/2004/3998-4037 dated 7<sup>th</sup> October, 2004

Sir,

With reference to the above, I am directed to inform you that Dr. V.B. Mathur, Professor & Head, Department of Protected Area Network, Wildlife Management and Conservation Education would participate in this meeting as representative of the Director, Wildlife Institute of India, Dehradun (UA).

Response of the Wildlife Institute of India on Agenda Item No. XLI-3(191)(d): *Flora, Fauna and Carrying Capacity- National Park/Sanctuaries* for ISP areas is enclosed for your kind perusal and necessary action.

Thanking you,

Yours sincerely,

(Dr. A.J.T. Johnsingh)  
Dean, Faculty of Wildlife Sciences

Encl.:a/a

Copy for information and necessary action to:

Dr. V.B. Mathur, Professor & Head, Department of Protected Area Network, Wildlife Management & Conservation Education, Wildlife Institute of India, Dehradun (UA).

Post Box No. 18, Chandrabani, Dehradun - 248001, India  
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E-Mail : wii@wii.gov.in

**Wildlife Institute of India's response to Agenda item No.XLI-3(191)(D): Flora, Fauna and Carrying Capacity – National Parks/Sanctuaries for ISP Areas**

1. The Wildlife Institute of India in its EIA Technical Report 09(1994) "*Impact Assessment Studies of Narmada Sagar and Omkareshwar Projects on Flora and Fauna with Attendant Human Aspects*" and in EIA Technical Report 10 (1994) "*An Ecological Assessment of the Proposed Protected Areas in Narmada Sagar and Omkareshwar Project Areas using Remote Sensing and Geographical Information System*" had proposed the establishment of 3 protected areas viz. Narmada National Park 496.70 km<sup>2</sup>, Surmánya Sanctuary 165.20 km<sup>2</sup> and Omkareshwar Sanctuary 126.67 km<sup>2</sup> to mitigate the impacts of these projects. A map showing the location of these protected areas is given in **Annexure - I**. However, in the Agenda Item No.XLI-3(191)(D): Flora, Fauna and Carrying Capacity – National Parks/Sanctuaries for Indira Sagar Project Areas (Page 23) it has been stated that the WII has proposed the following protected areas:

Omkareshwar National Park	-	475.22 km <sup>2</sup>
Surmánya Sanctuary	-	163.70 km <sup>2</sup>
Narmada (Mandhata) Sanctuary	-	119.96 km <sup>2</sup>

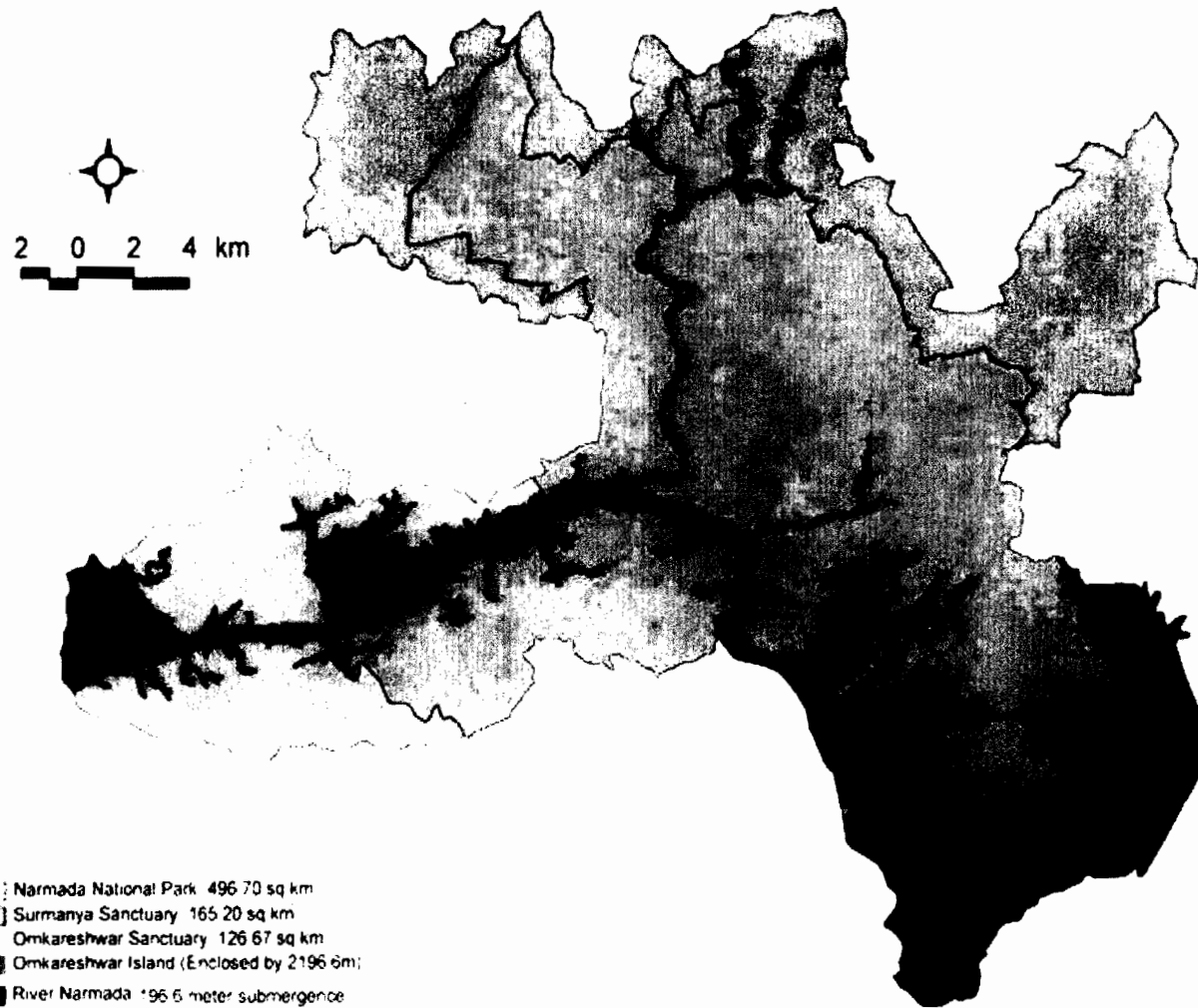
Since both the names and the respective areas as stated above are different from those given in the WII-EIA Technical Reports 9 and 10, the necessary corrections may please be made.

2. It is stated that the twin objectives of conserving wildlife and providing sustenance to forest dependent communities has been central in suggesting the establishment of these protected areas. No area smaller than this can be visualized to provide mitigation for impacted biological values and to accommodate the forest based needs of the local communities. The area is the only compact contiguous forest in the tract and occupies the surrounds of the lower Narmada Sagar (now Indira Sagar) and upper Omkareshwar reservoirs. As the PAs lie next to the two reservoirs, these would also be able to offer refuge to wild animals displaced by submergence. The recommendations of these PAs are based on comprehensive field research supported by satellite image interpretation and Geographic Information System overview carried out jointly by Wildlife Institute of India and Indian Institute of Remote Sensing, Dehradun. The proposed PAs include a part of reservoir ecosystem, the draw down areas, contiguous forests, a good mix of habitats with concomitant floral and faunal

values and also incorporates the only residual stretch of free river portion of Narmada between the Indira Sagar and Omkareshwar Projects. Besides catering to the ecological concerns, the PAs covering reservoir segments will provide a fish breeding natural nursery and thus will greatly support the fisheries in the non-PA segment of the reservoirs, where fishing may be permissible.

3. In the said Agenda item (page 24) it has been stated that in order to ensure that no villages are included inside the proposed PAs, the recommended area of the PAs has been reduced from 758.88 km<sup>2</sup> to 491.55 km<sup>2</sup>, which forms a reduction of 35.23%. In this connection it is stated that the areas suggested by WII in its report for establishment of PAs, forms a compact contiguous block of forests reasonably removed from major habitations. The entire area has just 18 very small to small villages, many of which are already stated for rehabilitation because of their falling in the submergence area (**Annexure - II**). Further, as per the Survey of India Toposheet 55B (1:250,000), 1983 two villages Dhardi and Singladev fall completely in the Narmada National Park area and eight villages (Bhaktgarh, Rampura, Dhardi, Bhetkhera, Tikari, Dharikotla, Jamoti and Chandgarh) have part of their area inside the Narmada National Park (**Annexure - III**). Similarly, there are villages inside the two proposed wildlife sanctuaries also. But these may not have to be relocated and an appropriate ecodevelopment strategy and plan can be formulated to reduce their dependence by providing viable alternatives funded by the project. In view of the above, the decision to reduce the area of the proposed PAs by 35.23% may kindly be re-considered.
4. The recommendations to establish the PAs were submitted by WII to NVDA in 1994 but till date their notification has not been done. This needs to be expedited.

**Proposed Protected Areas (One National Park and Two Wildlife Sanctuary) for mitigating the impacts of Indirasagar and Omkareshwar Projects**





**Annexure - II. List of villages located in the proposed protected areas.**

#	Name	Revenue/Forest	Tehsil	District	Name of PA
1.	Jatam	Revenue	Harsud	Khandwa	Narmada NP
2.	Chandgarh	-do-	-do-	-do-	-do-
3.	Boriya	-do-	-do-	-do-	-do-
4.	Pandiyadeh	-do-	-do-	-do-	-do-
5.	Nawghata	-do-	-do-	-do-	-do-
6.	Abhawa	-do-	-do-	-do-	-do-
7.	Bandhaniya	-do-	-do-	-do-	-do-
8.	Bijapur Khurd	-do-	-do-	-do-	-do-
9.	Bijalpur Kalan	-do-	-do-	-do-	-do-
10.	Mathni	Forest	-do-	-do-	-do-
11.	Bankapalas	-do-	-do-	-do-	-do-
12.	Sarai	-do-	-do-	-do-	-do-
13.	Jamoti	-do-	-do-	-do-	-do-
14.	Junapani	-do-	Khandwa	-do-	-do-
15.	Dharikotla	-do-	-do-	-do-	-do-
16.	Bhetkheda	-do-	Harsud	-do-	-do-
17.	Tikari	-do-	Khandwa	-do-	-do-
18.	Rampura	-do-	Udainagar	Dewas	Omkareshwar Sanctuary

Source: Narmada Sagar Project Rehabilitation and Resettlement Plan NVDA, 1991.

**Annexure – III. List of villages in and around the proposed protected areas.**

S. No.	Name	Villages to be relocated as falling in core area	Villages submerged whose area will form part of core zone of PA
1.	Bhaktgarh	-	*
2.	Rampura	-	*
3.	Potla	-	-
4.	Devghiri	-	-
5.	Dhardi	*	*
6.	Jajaphura	-	-
7.	Bawarikhera	-	-
8.	Bhetkhera	-	*
9.	Tikari	-	*
10.	Baiphall	-	-
11.	Rekla	-	-
12.	Chikdhaliya	-	-
13.	Richhi	-	-
14.	Piplani	-	-
15.	Bhongani	-	-
16.	Balwara	-	-
17.	Purni	-	-
18.	Junapani	-	-
19.	Dharikotla	-	*
20.	Jamoti	-	*
21.	Kharuwa	-	-
22.	Bijalpur kalan	-	-
23.	Bankapalas	-	-
24.	Mathni	-	-
25.	Chandgarh	-	*
26.	Pamakheri	-	-
27.	Nandana	-	-
28.	Dantha	-	-
29.	Sirkiya	-	-
30.	Kharari	-	-
31.	Surmanva	-	-
32.	Undel	-	-
33.	Iklera	-	-
34.	Bergaon	-	-
35.	Kantaphor	-	-
36.	Kanra	-	-
37.	Singori	-	-
38.	Bairagarha	-	-
39.	Sutaripura	-	-
40.	Chandupura	-	-
41.	Singladev	*	-
42.	Palasi	-	-

Source: Survey of India Toposheet, 55B (1:2, 50,000), 1983.

## Annexure – III. List of villages in and around the proposed protected areas.

S. No.	Name	Villages to be relocated as falling in core area	Villages submerged whose area will form part of core zone of PA
1.	Bhaktgarh	-	*
2.	Rampura	-	*
3.	Potla	-	-
4.	Devghiri	-	-
5.	Dhardi	*	*
6.	Jajaphura	-	-
7.	Bawarikhera	-	-
8.	Bhetkhera	-	*
9.	Tikari	-	*
10.	Baiphall	-	-
11.	Rekla	-	-
12.	Chikdhaliya	-	-
13.	Richhi	-	-
14.	Piplani	-	-
15.	Bhongani	-	-
16.	Balwara	-	-
17.	Purni	-	-
18.	Junapani	-	-
19.	Dharikotla	-	*
20.	Jamoti	-	*
21.	Kharuwa	-	-
22.	Bijalpur kalan	-	-
23.	Bankapalas	-	-
24.	Mathni	-	-
25.	Chandgarh	-	*
26.	Pamakheri	-	-
27.	Nandana	-	-
28.	Dantha	-	-
29.	Sirkiya	-	-
30.	Kharari	-	-
31.	Surmanva	-	-
32.	Undel	-	-
33.	Iklera	-	-
34.	Bergaon	-	-
35.	Kantaphor	-	-
36.	Kanra	-	-
37.	Singori	-	-
38.	Bairagarha	-	-
39.	Sutaripura	-	-
40.	Chandupura	-	-
41.	Singladev	*	-
42.	Palasi	-	-

Source: Survey of India Toposheet, 55B (1:2, 50,000), 1983.



केवल सरकारी प्रयोग के लिए  
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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**तैतालिसवी बैठक की कार्यसूची**  
**Agenda for the 43<sup>rd</sup> meeting**

स्थान : पर्यावरण भवन, नई दिल्ली  
Venue : Paryavaran Bhawan, New Delhi

दिनांक : 27 नवम्बर 2006 11.00 बजे पूर्वाह्न  
Date : 27<sup>th</sup> Nov., 2006, 11.00 A.M.

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
नवम्बर, 2006  
**Indore**  
November, 2006

### AGENDA FOR THE 43<sup>rd</sup> MEETING OF ENVIRONMENT SUB-GROUP

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**AGENDA FOR THE 43<sup>rd</sup> MEETING  
OF ENVIRONMENT SUB-GROUP**

**Item No. XLIII-1(199) : CONFIRMATION OF MINUTES OF THE 42<sup>nd</sup> MEETING OF  
THE ENVIRONMENT SUB-GROUP.**

Minutes of 42<sup>nd</sup> Meeting of Environment Sub-Group of Narmada Control Authority held on 7<sup>th</sup> April, 2005 were circulated to all Members and Invitees vide Narmada Control Authority office letter No. Env-3(42)/2005/2272 dated 18<sup>th</sup> May, 2005.

No comments are received. Minutes are put up for confirmation.

**Item No. XLIII-2(200): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES – PRESENTATION OF THE REPORT OF THE COMMITTEE.**

During 42<sup>nd</sup> meeting NCA was directed to organise field visits of the committee by associating CCF of MoEF to verify the quality and quantity of the forest cover in the catchment, compensatory plantation and also to assess the status of compliance on the actions required to be taken for management of the downstream environment. In addition to the above the committee visited command area, submergence areas, sanctuary etc.

**a. Visit to the areas in Gujarat.**

Visits were undertaken to the areas in Gujarat during June and November, 2005. Command area, compensatory plantations, catchment area treatment, felling in the submergence area, areas downstream of SSP and Shoolpaneshwar sanctuary etc, were inspected. Detailed discussions were also held with the concerned officials of the Govt. of Gujarat, the Managing Director & Chairman of the SSNNL. Copies of the reports alongwith recommendations were circulated to the members & invitees separately vide letter no Env4 (43)/2450-2485 dated 15/09/06. Key recommendations are presented below;

**SUMMARY OF RECOMMENDATIONS: PRIORITISED ACTIONS.**

**Field visit during June 05**

S.No.	Issues	Recommendations
1.	Downstream flows	Minimum quality of water required for protection of d/s environment is mandatory and has to be ensured.
2.	Downstream management plan	To be prepared and implemented at the earliest without further delay.
3.	Flora and Fauna: Conservation of rare species / variants	Part area of sanctuaries should be developed as a garden for multiplication of identified rare species, local areas along the canal to be developed to conserve local herbs, shrubs tree species.
4.	Felling of trees	To be taken up/ completed in planned manner commensurate with progressive filling of the reservoir.
5.	Ex-situ & in-situ biodiversity conservation in the command.	To be taken up before commencement of irrigation.
6.	Health	Considering reported rise in diseases and consequent high risk, qualified experts may be involved in preventing recurrence of various diseases.
7.	Command Area Development	Implementation of all identified Environment Safeguard



	works(protective and restorative).	measures is required <u>pari-passu</u> with the development of command area for which Government has to take immediate actions.
8.	Efficacy of Catchment area treatment works.	Study to continue at least for a three years period
<b>Field visit during November 05</b>		
9.	Compensatory plantation	
<ol style="list-style-type: none"> <li>1. There is a need to prepare a list of successful species and to keep the germ-plasm ready for plantations to be taken up in future in the same areas.</li> <li>2. There is a need to provide for replacement of casualties due to death decay or wilting and to provide support for artificial propagation of the species planted up. If necessary, help from organisation like Arid Zone Research Institute of Central / State Govts. may be obtained.</li> <li>3. There is a need to establish seed orchards / clonal orchards for providing support for the activities suggested in para one.</li> <li>4. There is a need to consider culture of Rhizobium for development of root nodules.</li> <li>5. There is a need to keep in check infestation of termite through Silvi cultural / chemical control.</li> <li>6. In future sufficient number of fruit and fodder trees may be planted up for supporting wildlife in the area of sanctuary.</li> <li>7. These areas may also be utilised for raising palatable grasses to be as valuable source for protection of these plantations.</li> <li>8. There is a need to provide financial support for keeping planted up area in good condition in terms of watch &amp; ward, replacement of casualties and research &amp; development work for promoting natural / artificial regeneration of the identified species.</li> </ol>		

Observations of independent expert Prof. Ramaseshan and Prof R.K.Katti on the conditions of implementation of command area works are collectively placed at **Annex XL-III ( 1 )**.

**b. Visit to the areas in Madhya Pradesh**

Visits were undertaken to the ISP and SSP areas in Madhya Pradesh during March, 2006. Site inspections were carried out for the areas of compensatory plantations, catchment area treatment, seismic monitoring stations, flora and fauna related issues for both ISP & SSP. Besides these areas of felling in the submergence areas and downstream of ISP, detailed discussions were held with the officials of the Health Department of the Govt. of Madhya Pradesh and officials of NVDA. Conclusion was derived and recommendations were made. Copies of the report have been circulated vide letter no ENV 4(43)/ 2450-2485 dated 15<sup>th</sup> September 2006. Key recommendations are presented below for a review by the Members.

### Sardar Sarovar Project in Madhya Pradesh

Parameters	Status	Recommendations
Flora Fauna & Carrying Capacity (Terrestrial Eco-system)	Not yet started.	EIA studies should be expedited and recommendation implemented before submergence. Impacts have commenced but safeguards measures are not in place.
Aquatic Eco-system	Not yet started. Up-dation of plan needed.	Up-dating of plan and implementation should be high priority. Impacts have commenced but safeguards measures are not in place.
Health Aspects	In progress.	Implementation of the action plan on ground should have been completed and disease monitoring required on long term basis.
Felling of trees	Coppice crop & secondary species left over in the field, required removal.	Coppice crop of the forest felled earlier required removal on priority.
Quality of CAT works	Not yet started	Silt monitoring is to be started as early as possible.
Catchment Area Treatment (Physical)	completed	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.
Compensatory Plantation Physical targets	completed	To revisit the areas for maintenance & casualty replacement.
Quality of CAF works	Not yet started	Crop Diameter and Crop height required to be assessed by complete enumeration through identified agencies.
Seismicity & Rim Stability	In progress.	Recommendations of the dam Safety review panel should be put up to the Sub Group from time to time IMD may be requested to provide V-Set communication facilities for all observatories.

### Indira Sagar Project in Madhya Pradesh

Parameters	Status	Recommendations
Flora Fauna & Carrying Capacity (Terrestrial Eco-system)	Studies completed. Intention plan yet to be translated into Action Plan.	Concerns raised by WLI should be resolved on priority. Declaration of Sanctuaries / National Park awaiting approval of the State Cabinet for the last one decade, impacting flora & fauna from the submergence adversely.
Aquatic Eco-system	Not yet started. Up-dation of plan needed.	Up-dating of plan and implementation should be high priority.
Health Aspects	In progress.	Implementation of the action plan on ground should have been completed and disease monitoring required on long term basis.
Felling of trees	Coppice crop & secondary species left over in the field, required removal.	Coppice crop & secondary species left over in the field, required removal on priority, even if uneconomical for preventing degradation of the Environment.

Command Area Development	Preparation of EIA report & Management progressing	Dam is ready, command area planning and implementation is much behind schedule. This should be speeded up.
Quality of CAT works	Not yet started	Silt monitoring is to be started as early as possible.
Compensatory Plantation Physical targets	Nearly completed	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.
Quality of CAF works	Not yet started	Crop Diameter and Crop height required to be assessed by complete enumeration through identified agencies.
Catchment Area Treatment (Physical)	Nearly completed	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.
Seismicity & Rim Stability	In progress.	Annual maintenance contract required urgently, IMD may be requested to provide V-Sat communication facilities for all observatories.

**Item No. XLIII-3(201): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES - SARDAR SAROVAR PROJECT:**

During the 41<sup>st</sup> meeting held on 6th January, 2005, the Sub-group reviewed the implementation of the environmental action plans and preparedness of the State Governments for completion of the remaining works. Keeping in view the assurances conveyed by the concerned states for completion of the remaining activities by the end of March, 2005, the Sub-group recommended to NCA to permit raising the height of dam to the next stage of construction i.e. upto EL 121.92 m from environmental angle. During 42<sup>nd</sup> meeting held on 7<sup>th</sup> April 2005 the Sub-group reviewed the preparedness of the project authorities towards implementation of the required environmental safeguards.

A review of the present status of Survey, planning, implementation of the Environment Safeguard Measures commensurate with progressive filling of the reservoir at dam height of EL 121.92 m and with respect to full reservoir level is presented below.

**Sardar Sarovar Dam : Submergence ( progressive) at EL 121.92 m**

After raising the dam height to 121.92 m., the resulting impoundment, upstream of SSP will submerge an area of about 16,800 ha, out of a total of 37,533 ha.

Action Taken Report as on 30<sup>th</sup> June 2006 is presented below for a review by the Sub-group.

**A) Action Taken Report on implementation of the environment safeguard measures.**

		<b>Requirement for pari-passu compliance</b>	<b>Gujarat</b>	<b>Maharashtra</b>	<b>Madhya Pradesh</b>
Catchment Area Treatment	Qualitative	<i>Assessment of adequacy</i>  Final reports assured for submission by March, 2005.	Observations of the Members on the Draft report are placed as enclosure to Annex – XLIII-(1).	Two silt monitoring stations were to be established. at an estimated cost of Rs.17.21 lacs for 2 years duration by Water Conservation Research & Training Institute, Wasad Dist. Karia, Gujarat.  <b>Report awaited.</b>	<b>Awaited.</b>
Compensatory Plantation	Qualitative	■ <i>Afforested areas to be declared as forest</i>	Process initiated for 96% of the area. Details of the completed work awaited.	Process initiated for 80% area. Most of the proposals for declaration are pending.  Details of the completed job awaited	Process initiated for the entire area and 80% areas already covered. Details awaited.

		<ul style="list-style-type: none"> <li>Survival percentage, crop composition to be assessed.</li> </ul>	<b>Awaited</b>	The average survival rate for plantation over an area of 14,710 ha. land as report by GoM was 48% (09-06-2005).	<b>Awaited</b>
<b>Felling of trees</b>	<b>Quantitative</b>	Entire tree growth including coppice crop from the submergence area should be removed before commencement of impoundment.	About 30% of the tree growth coppice from the submergence zone w.r.t. EL 121.92m was removed. Balance area is yet to be felled. Secondary species are to be removed.	<ul style="list-style-type: none"> <li>Felling of trees except in 27 ha completed between EL 110.64 &amp; 121.92 m .</li> </ul>	Felling in entire forest area coming under submergence is completed. However 8,159 trees in non-forest area( beyond EL 121.92m) up to FRL were yet to be felled. Now coppice crop required to be felled.
<b>Flora Fauna</b>			<ul style="list-style-type: none"> <li>Progress on implementation of the recommendations of EIA reports awaited.</li> <li>Implementation of the recommendation of the committee (Field visit) of ESG, June 05 awaited</li> </ul> <b>Progressing</b>	<ul style="list-style-type: none"> <li>Implementation report on recommendations of the studies such as Buffer zone plantations, as planned could not be taken up for wants of allocation of resources.</li> <li>Plantations over 218 ha were completed. It was assured to take up advanced works in the coming seasons to cover the backlog.</li> </ul> <b>Awaited.</b>	<ul style="list-style-type: none"> <li>Implementation of social forestry plan started. Observations of the committee are discussed in the report presented in the agenda.</li> <li>EIA report on proposed sanctuaries was directed by the ESG. NVDA is negotiating with Wildlife Institute of India, Dehradun</li> </ul> <b>Progress Awaited.</b>

<b>Carrying Capacity</b>		<b>Studies completed, implementation awaited.</b>	<b>No Progress reported</b> ► No Progress due to non allocation of resources	► Implementation is in progress. ► Revised plan awaited
<b>Fisheries Conservation Aspects</b>	Completion reports assured for submission by March, 2005.	Draft blue print submitted by Prof. S. Dutta (IIMA) was circulated to all States concerned for comments which are yet awaited.  Compliance on the issues raised during the meeting to be submitted.	► Studies entrusted to CICFRI assured for completion. ► Actions on the directions of the high level Expert group on fisheries development and conservation awaited.	No progress reported.
<b>Downstream Environment</b>	Detailed plan & Implementation of the recommendations by Wallingford Institute was to be submitted by March 2005.	Compliance on the recommendations of the EIA report submitted by Wallingford Institute on Safeguarding downstream flora & fauna was awaited.	N.A.	N.A.
<b>Downstream Flows</b>	To ensure 600 cusecs of water flows downstream from Environmental Consideration, specially during the non monsoon months	GoG may provide details of the mechanism put in place for ensuring release of 600 cusecs water in downstream on continuous basis during non monsoon months.	N.A.	N.A.

	Gujarat	Status	Rajasthan	Status
<b>Command Area Development</b>	<ul style="list-style-type: none"> <li>Irrigation to commence after implementation of approved command area development plan.</li> <li>Submission of Micro-Plan for 44,000 ha. area proposed to be brought under irrigation.</li> <li>Issues related with migration of wild ass across Runn of Kutch to be resolved through consultation/discussion.</li> </ul>	Plan for 41,305 ha received on 27 <sup>th</sup> December 2005 is under scrutiny of the Members.	1. GoR to revise the CAD plan to include concern of Members and make detailed presentation on revised plan in the next meeting.	Compliance awaited.
		<b>Gujarat</b>	<b>Maharashtra</b>	<b>Madhya Pradesh</b>
<b>Health</b>	<p>Addl. Facilities as required must be provided.</p> <p>Monitoring reports should also be available.</p> <p>Data to be put up on the web site.</p>	<p>Committee of the ESG interacted with Joint Director Health, Gujarat during June 05 &amp; recommended that</p> <ul style="list-style-type: none"> <li>► Increase in trends of malaria need to be halted.</li> <li>► Monitoring should be projected specifically.</li> <li>► Health expert should visit the areas.</li> </ul>	<p>Implementation report received is not in consonance with the action plan submitted by GoM earlier. Revised action plan awaited.</p> <p>Report on Epidemiological Surveillance Studies received is also not based on the identified impacts of SSP but showed general Malaria pattern in Nandurbar District. All other information is awaited.</p>	<p>Geographic reconnaissance studies of disease vector currently under progress for the ISP shall be applicable to SSP areas also upon completion. Report awaited.</p>
<b>Seismicity &amp; Rim Stability</b>	<p>Equipments were to be updated, as per recommendation of the IMD</p> <p>Collection and analysis of data should be a continuous process.</p>	Latest status awaited.		
<b>Archaeology</b>	Relocation / protection	Progressing as per plan submitted.		

**B) Current Status of Implementation of the Environmental safeguard measures commensurate with dam height to full reservoir level.**

To facilitate a review of the compliance of the directions given by the Sub-group, for considering raise in the dam height, status of the implementation of the environment safeguard measures is presented below.

**(a) CATCHMENT AREA TREATMENT**

Out of total Catchment of 24,45,163 ha, 28.4% was found critically degraded. 6.66% of the total catchment was treated under phase-I and balance area is proposed to be treated under Phase-II.

❖ **Phase-I.**

- i) Project authorities were required to prepare plans for treating those critically degraded sub-watersheds which were identified as directly draining into the reservoir. The implementation of the plan was to be pari-passu with the construction of the dam.
- ii) To assess the success or failure of the CAT measures implemented for ensuring that structures were maintained and remained functional. Sub-Group suggested use of aerial photography / Remote sensing for assessment of the success rate of CAT works in forest areas besides establishment of silt monitoring stations for the non forest areas. Progress on assessment work is presented in the table below:

S.No.	States	Forest cover assessment	Silt monitoring
1.	Govt. of M.P.	Awaited	Awaited
2.	Govt. of Gujarat	Updating under progress	Further report awaited.
3.	Govt. of Maharashtra	Updating under progress	Two stations established, report awaited.

❖ **Phase-II**

The balance sub-watersheds were to be treated under programme for implementation in a time frame to be determined separately by the project authorities in consultation with the Ministry of Environment & Forests.

**Govt. of Gujarat :** The Phase-II area in Gujarat was less and therefore Govt. of Gujarat treated this area under Phase-I itself. Treatment works were already completed.

**Govt. of Maharashtra :** The gross area for which plans are required to be submitted for Phase-II programme is 77568 ha, the progress reported was 14904 ha.

**Forest Area :** An area of 7218.96 ha of forest area was treated during the last 10 years.

**Non Forest Area:** Agricultural areas in 5 sub-watersheds were treated at an estimated cost of Rs.9.86 crores and for treating the balance area Rs.5.02 crores are required for the agricultural department of which Rs.3.26 crores during 2005-06 and Rs.1.76 crores during 2006-07.

**Govt. of Madhya Pradesh:** The gross area for which plans are required to be submitted for Phase-II programme is 3,18,118 ha, the progress reported was



35,312 ha. However, Govt. of M.P. have expressed inability in treating these areas commensurate with progressive filling of the reservoir due to lack of funds and manpower.

(b) **COMPENSATORY PLANTATION :**

**QUANTITATIVE.**

- o It was informed by the Party States that the physical works on the available areas were completed.

States	Physical : Achievement (ha.)
Madhya Pradesh	8,737
Maharashtra	19,378
Gujarat	13,950
<b>Total:</b>	<b>42,065</b>

**QUALITATIVE**

In terms of the order of clearance, the non forest areas planted up by the project authorities are required to be handed over to the regular territorial forest divisions for regular upkeep & maintenance and till such time these were to be handed over to the regular department plantations were required to be maintained with watch & ward as per the planned programme. Besides, survival count, species composition, year of count and the areas under each category was required. The progress is presented below:

States	Progress.
Madhya Pradesh	80% non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage and crop composition being updated.
Maharashtra	About 80% of non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage was reported to be 48% and crop composition is awaited. .
Gujarat	96% non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage and crop composition being updated.

Members may like to discuss & review.

(c) **COMMAND AREA DEVELOPMENT**

**GOVT OF GUJARAT**

The command area of the project has been fixed on the basis of areas included by NWDT for purposes of considering requirement of Narmada water for irrigation. Stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India required series of actions to be taken on the field before commencement of irrigation. Key stipulations are indicated in the Annex – XLIII- ( 2 ).

During 41<sup>st</sup> meeting of the Environment Sub-group it was assured by the Govt. of Gujarat that Micro-plan for about 44000 ha area proposed to be irrigated during Phase-I shall be submitted soon and that all required environmental safeguard would be implemented before commencement of the irrigation. Compliance on the observations of the committee who visited the command area in Gujarat as already discussed above, is awaited.

1. A copy of the micro-plan for development for CCA of 41,305 ha under Phase-I of the command was received during last week of December 2005. Copies of this plan in electronic format have been circulated to the concerned members and is under scrutiny of the Members.
2. In Gujarat the GCA of the project is 3.43 million hectares of which Cultivable command is estimated to be 2.12 million hectares and annual irrigation is proposed in an area of 1.792 million ha. In order to achieve increase in efficiency of irrigation with the limited quantity of water without impacting the environment adversely, the Govt of Gujarat planned to introduce several measures. However stipulated action as per the CAD plan on formation of the farmers' co-operatives, volumetric water release to them, rotational water distribution, canal automation, conjunctive use etc are yet to be made operational. Monitoring proforma developed on the advice of the MoEF is placed at **Annex-XLIII-(3)**. SSNNL is requested to fill up the progress achieved in the gaps under each category separately.
3. In addition Gujarat also planned to provide drinking water to Saurashtra and Kachchh regions through a separate drinking water project. Detailed project report and mitigatory measures planned on this project during the normal year and drought year are awaited.
4. Progress on scheduling, budget towards implementation of the Safeguard measures to contain identified negative consequences of the irrigation commensurate with proposed / practised irrigation, even in the Phase-I areas is awaited. The measures proposed in the CAD plan as outlined in the **Annex – XLIII (3)** have not yet been fully implemented.

In view of the above, plan needs revision for incorporating environment safeguard measures commensurate with progressive irrigation in adequate manner.

Members may like to discuss & review.

#### **Govt. of Rajasthan**

In Rajasthan for 2.3 million ha of GCA, Command Area Development Plan was required to be prepared and implemented commensurate with the development of irrigation in the command area. Command area Macro plan for the areas in Rajasthan was received and discussed during the 42<sup>nd</sup> meeting. It was directed by the Sub-Group that the issue raised should be resolved by the Govt. of Rajasthan through discussions. In pursuance, the discussions were arranged in which Director (Env.), NCA, Prof. Ramaseshan, Expert on Hydrology participated on behalf of the Environment Sub-group, whereas officials of the Govt. of Rajasthan, consultants engaged by Govt. of Rajasthan participated on behalf of Govt. of Rajasthan. Discussions remained un-conclusive for the want of required data and copy of the detailed project report from

Govt. of Rajasthan. It emerged from the discussions that the plans submitted by the Govt. of Rajasthan are required to be recasted otherwise if implemented without extensive revision it would convert the command area in Rajasthan to a saline desert besides impacting environment adversely. A copy of the observations of expert member Prof. Ramaseshan and of the Director (Env.), Narmada Control Authority on the issues related with Environmental Management conveyed to Govt. of Rajasthan are placed at **Annex – XLIII-( 4 )**. Govt. of Rajasthan may submit the compliance

Initial plan was submitted during 1990	Sub-group directed for revision & EIA studies.
Drainage/conjunctive use/water quality aspects	Completed by WAPCOS in 1996. Area to be irrigated was increased
Preparation of the Plan through ICCB	Plan submitted by GoR and circulated to the Members for a review. A phased programme with budget & monitoring awaited.
Discussions on the plan during 42 <sup>nd</sup> meeting	Identified problem areas in implementation and suggested resolving the issues raised through discussions amongst experts.
Discussions held on 17 <sup>th</sup> August, 2005.	Discussions remained in-conclusive for want of data and DPR from the project authorities.

Members may like to discuss & review.

#### (d) FLORA, FAUNA & CARRYING CAPACITY

The guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora and fauna present can be assessed, listed (rare and endangered) species can be detected, if present, and appropriate conservation measures devised before commencement of the submergence.

Implementation of the recommendations contained in the EIA studies carried out by the agencies engaged by the Gujarat, Maharashtra & Madhya Pradesh were required to be implemented in time.

##### **Govt. of Maharashtra :**

EIA reports indicated presence of rare, endangered and threatened species of wildlife calling special measures for their conservation. State Govts. proposed amongst others two critical restorative measures as brought out below :

1. Buffer zone plantations for rehabilitation of wildlife moving out from the submergence area.
2. Management of corridors for shifting of wildlife, several corridors, passing through moderate to good (0>3) vegetation cover.
3. Studies on development of neo ecosystem

These measures were required to be taken before commencement of submergence in terms of the order of clearance and direction of the Sub-group. Sub-Group considered the requests permitting raising of the dam height on the assurances of the project authorities for completion of needed safeguard measures in time. GoM submitted revised estimates of Rs. 7.767 crores (price level of 2004-05 for taking up

buffer zone plantations over a period of 3 years. However Govt. of Maharashtra due to lack of inter departmental coordination allotted no resources for implementation of the safeguard measures. Areas in Maharashtra have already experienced negative impacts due to submergence during the past years. Recently GOM reported that against a target of 1500 ha an area of 218 ha was planted during 2005 and it is planned to plant 782 ha area during the monsoon of 2006 .

Members may like to discuss.

#### **Govt. of Gujarat :**

M.S. University, Vadodara conducted EIA & recommended several measures for preparation of Environmental Management plan for the upstream environment. Key recommendations focused amongst others on the following issues.

- Rehabilitation plan for the identified animals and plants.
- Recommendations of the M.S. University, focusing on activities of the joint forest management committees and specific recommendations for the protection and conservation of *Butea monosperma* (yellow variant) and *Radernachera xylocarpa* which were unique and represented important and rare floral element
- To undertake development programme in rural areas in natural watershed unit.
- Training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state.
- An independent monitoring and evaluating infrastructure for successful execution of these strategies and action plans.
- Govt. of Gujarat reported progress on development of Shoolpaneshwar Wildlife Sanctuary. A detailed report on development works under implementation in the Sanctuary areas and on migration of wild animals during progressive filling of the reservoir is awaited.

Further progress on other recommendations of the EIA study group is awaited. Compliance of the recommendations of the ESG Committee is awaited.

Members may like to discuss and review

#### **Govt. of Madhya Pradesh :**

State Forest Research Institute, Jabalpur carried out the EIA for the areas in Madhya Pradesh and recommended measures for drawing up of the environmental management plan.

State Govt. however proposed restorative and ameliorative safeguard measures as brought out below :

1. To cater to increase requirement of timber, fuel-wood etc., social forestry programme at an estimated cost of Rs.5.0945 crores chargeable to SSP (price level of 1999-2000) with escalation of 9% pre annum was approved by the State Wildlife Committee.
2. 60 islands which will be formed in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.
3. Studies recommended creation of two wildlife sanctuaries namely Mathwad (34.659 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district. The State Wildlife Committee had not accepted these recommendations during its earlier meeting (July, 2000). However, during its meeting convened recently in November,

2002 reconsidered the decision and recommended creation of Mathwad sanctuary (at an estimated cost of Rs.21.76 crores) as per recommendation of SFRI but instead of Bokrata Sanctuary recommended Kathiwada Sanctuary (at an estimated cost of Rs.13.97 crores) a little away but within the same ecological zone.

GoMP also proposed formulae for sharing of the cost of the development of all the sanctuaries and National parks, proposed to be developed in the basin from ISP to SSP, in the same proportion as agreed for dam and appurtenant works for ISP and SSP. A proposal in this regard was submitted by the GoMP and was circulated along with minutes of the 40<sup>th</sup> meeting of Env. Sub-group. During this meeting, after some discussions on the issue, it was observed by the Sub-group that it would be pre-mature to discuss creation of these sanctuaries without an EIA report. As per the information received from the GoMP negotiations for carrying out EIA studies with Wildlife Institute of India, Dehradun are in final stages.

Members may like to discuss and review.

### **Aquatic Environment :**

Impoundment in SSP commenced with the closure of construction sluices during Feb 1994. The impoundment has progressed with the attainment of height of E.L. 121.92 m. resulting in much larger water spread, requiring a number of sequential actions, in accordance with pre & post impoundment action plan suggested by the CICFRI to safeguard the aquatic environment as brought out in the **Annex – XLIII – (5)**. State Govt's are requested to present the steps taken to safeguard the aquatic environment.

Observations of the State Govts. on the actions suggested by IIM in the report sent to the State Govt. are also awaited.

### **Felling of the Trees in the submergence area**

Plans for felling of trees in the forest area coming under submergence to avoid the possibility of animals being trapped in the submergence area, prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc. were required for the areas in Gujarat, Maharashtra & Madhya Pradesh. Forest areas were required to be taken up for felling in a systematic manner to avoid any possibility of the same.

#### **Madhya Pradesh**

Felling in entire forest area coming under submergence is completed. However 8,159 trees in non-forest area up to FRL were yet to be felled.

#### **Govt. of Gujarat**

In Gujarat the forest area diverted was 4165.91 ha in addition 356.78 ha was diverted earlier. Thus in all 4522.69 ha was utilized for the SSP. Of this 4152.68 ha of the Distt. Vadodara and Bharuch required felling. The felling in Gujarat was reported to be completed about a decade ago. However pole crop has come up again and required felling. It was observed by the Committee of the ESG that corresponding to 121.92 E.L. about 30% of the area only could be felled and balance 70% felling is awaited.

#### **Govt. of Maharashtra**

## Govt. of Maharashtra

In Maharashtra the forest area of 6,488 ha was diverted for submergence out of which 3,157.03 ha was forest. The balance area was under river bed, nallah etc. Of this 2288.63 ha lied between 90 m & up to four meter below the FRL. Felling of Trees, except for 27 is completed upto EL 121.92m. Coppice crop shall require removal prior to submergence

Members may like to discuss and review.

### (e) SEISMICITY AND RIM STABILITY

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. Dam design in India is regulated by a national standard developed by the Bureau of Indian Standards (BIS). The BIS has classified the Indian sub-continent into 5 zones depending on tectonic, geologic and seismic consideration using available data. The River Narmada lies in the seismo-tectonic provinces of Cambay Basin and Peninsular Shield (including the Deccan Trap) and comes under Zone 3 of the BIS classification.

**Rim stability** refers to the competency of reservoir base rocks to maintain natural slopes and to contain the stored water. Under stable conditions, there should be no significant losses of reservoir water due to ground water percolation or seepage. Where rocks are found to be highly permeable, mitigative measures are needed to ensure the longevity of the reservoir.

The GOG appointed a Dam Review Panel, comprising engineers and geologists, to evaluate the report and findings and a revised final report was submitted to the project authorities in 1982. The main mitigation measures suggested were as follows :

- Construction of dams and Infrastructure (Incorporating seismic design coefficients) to withstand the maximum credible earthquake
- Establishment of seismic monitoring stations at key locations around the reservoir

ACTION	STATUS
Dam design modifications : <ul style="list-style-type: none"> <li>▪ Adoption of horizontal design coefficient of 0.125g on the recommendation of the Dam Review Panel</li> <li>▪ Installation of stress monitors in the main body of the dam</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ GSI (Nagpur Division) Rim Stability studies</li> </ul>	Completed
<ul style="list-style-type: none"> <li>▪ Tracer Studies by CWPRS</li> </ul>	Completed

▪ Monitoring stations	Rim stability studies have been completed and well equipped 9 monitoring stations along the periphery of the reservoir, 4 each on either side and one at the downstream of the Sardar Sarovar reservoir. Out of a total of 9 stations, 3 are in M.P. (Alirajpur, Kukshi and Badwani, 1 in Maharashtra (Shahada) and 5 in Gujarat (Kawant, Naswadi, Kevadia, Jitgaon )
▪ Results of analysis of data from monitoring stations.	Received, analysed by the dam safety review panel of the SSP during October, 2001. Up-dation of the data is awaited.

Regarding up-gradation of network, the technical specifications were being worked out in consultation with IMD. The up-gradation was likely to cost about Rs.5.50 crores. GoG had planned to invite tenders by August, 2004 for the same work. The work was to be completed by September, 2005. Progress from Gujarat is yet awaited.

It was reported during 40<sup>th</sup> meeting that Seismic activity at the dam site and around the periphery was being studied by a team of experts. The data was being analysed and annual seismological bulletins were being published. GoG had requested the Director General, Indian Seismological Research Institute (ISRI), for the evaluation of the Seismic data obtained by the SSNNL.

Further progress may please be reported by the GoG for a review by the members .

(f) **HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, a specific requirement for the SSP contained in the environment clearance order of GOI was that the plans for the provision of health facilities to workers and residents of the affected areas should be prepared. Each State should take necessary measures to minimise the risk of malaria, filarial, schistosomiasis and other diseases associated with water that may result from implementation of the project. Preparation of an Action Plan for the surveillance and control of malaria was also stipulated.

As per the further directions received from the MoEF in 1987, the states were required to take up measures given in the following table.

	Mitigation measures	Gujarat	Maharashtra	Madhya Pradesh
1.	Present status of the waterborne disease in the areas	Pre-impoundment data is available.		
2.	Screening arrangements for workers at the project site proposed for the work force;	Completed	Not relevant	Not relevant
3.	Epidemiological Surveillance studies	Completed by SCHMS	Report on disease pattern of Nandurbar District received, but fall much short of the requirement.	Completed by GMC, Bhopal.
4.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases	Action plan under implementation	Revised Action plan awaited	Action plan revised on Aug. 2003
5.	Reinforcement proposed to the existing health delivery system commensurate with height of 110.64 m RL. In upstream areas and at the project site.	Completed	Incomplete	Incomplete

6.	Surveillance of diseases	Progressing	Continued to be weak .	Surveillance is weak. Reports not received.
7.	Standard formats available with the NICD to be used for diseases surveillance purpose.	Progressing	Format circulated, implementation awaited.	Awaited
8.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	Progressing	Awaited, two water quality labs working , four being operationalised. Pada Workers are appointed to perform house to house disinfections with the help of Mediclors.	Awaited
9.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.	Progressing	Awaited	Awaited
10	Regular Entomological monitoring is suggested for alterations in ecology of the area due to irrigation / impoundment.	Progressing with the help of ICMR.	Awaited,	Awaited
11	It is suggested that sanitary latrines be established at the R&R sites and  Villagers may be educated to use these to keep the cases of Gastro diseases in check.	Progressing	Awaited Health Department is performing IEC activities to educate the people.	Awaited
12	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited	Awaited	Awaited

The status of compliance of requirement may be discussed and reviewed by the Sub-group.

#### (g) ARCHAEOLOGY & ANTHROPOLOGY

In addition to the general obligation of the States under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out below.

- 1) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- 2) Plan for rehabilitation of monuments wherever necessary.

The current status of the protection / relocation works is presented below :



		Gujarat	Maharashtra	Madhya Pradesh
Monuments	FRL	2 ( 2 completed)	Nil	Completed
	Commensurate with EL 121.92 m			NVDA assured that no approach shall be impacted
Mounds	FRL	Nil	Nil	Completed
	Commensurate with EL 121.92 m			NVDA assured that not likely to be impacted
Museums/ Park	FRL	N.A.	N.A.	4 ( 1 completed)
	Commensurate with EL 121.92 m	N.A.	N.A.	Not relevant

Further progress may be informed to the Sub-group.

#### (h) ENVIRONMENT MANAGEMENT OF DOWN STREAM AREAS

During 41<sup>st</sup> meeting Prof. Ramaseshan pointed out that a comprehensive plan for management of downstream environment was not yet available. He pointed out that HR Wallingford in their studies of 1995 have brought out a series of actions required to be taken during pre and post impoundment phases of Sardar Sarovar Project as brought out below:

- ▶ Provisions for complimentary flows for mitigating pollutions in the downstream, restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone,
- ▶ Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality including physical, chemical and biological parameters,
- ▶ Developing of mathematical modelling for prediction of likely impacts of different operational scenarios for mitigation, studies on ecology and resources for the downstream environment, narrowing of river channel,
- ▶ Legal agreement between the Party States for regulated releases to ensure that project works as planned.
- ▶ In addition he also mentioned that releases downstream may also have to be diluted for keeping the surface as well as ground water in good condition.

During 41<sup>st</sup> meeting it was directed by the Chairman that it was necessary to maintain downstream flows to a minimum level otherwise it may be hazardous for the environment downstream specially with regard to flora and fauna, fishes, pollution, health etc. He desired that bare minimum quantity of water is required to be assessed and flows maintained accordingly in downstream by all means without fail. He desired NCA to monitor and evolve a mechanism to ensure that the water downstream never falls below the minimum specified. If feasible this should be monitored hourly. In case of any shortfall, reservoir operation should be controlled in such a manner that minimum quantity downstream never gets restricted. SSNNL / GoG assured that 600 cusecs of flow which is considered adequate by them for maintaining environment conditions in the downstream shall be maintained.

GOG may inform the status of status of compliance during non monsoon critical months.

**Item No. XLIII-4(202): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES INDIRA SAGAR PROJECT :**

**A. INDIRA SAGAR DAM: SUBMERGENCE (PROGRESIVE) AT EL 255.00 M.**

Indira Sagar Project (ISP) formerly known as Narmada Sagar Project has an installed capacity of 1000 MW and annual irrigation of 1.69 lacs ha. The project is very crucial due to requirement of regulated releases of 8.12 MAF of water from this project for SSP.

After getting necessary clearances the construction works were started in May, 1992 and the dam was targeted to be completed by June, 2000. However, due to various reasons the progress lagged behind. Subsequently, the work was handed over to Narmada Hydroelectric Development Corp. (NHDC), a Joint Venture of Govt., of Madhya Pradesh and National Hydroelectric Power Corporation. As per the available information the constructions works were completed and project is schedule for commissioning. However, as per directive of the Hon'ble Jabalpur High Court of M.P. the water level in the dam is maintained below EL 255 m. Accordingly the ISP is due to submerge an area of 91,000 ha. this would impact the land, Flora and fauna etc.

Month / year	Level in m
Level being maintained	255
June, 2004 (It was planned to complete by Dec. 2004, now delayed)	MRL

**B) CURRENT STATUS OF IMPLEMENTATION OF THE ENVIRONMENTAL SAFEGUARD MEASURES COMMENSURATE WITH DAM HEIGHT OF FULL RESERVOIR LEVEL.**

**(a) CATCHMENT AREA TREATMENT (in ha)**

As per stipulations, considering the construction schedule, works in the entire Phase-I area should be completed by December 2004. The progress achieved upto July, 2004 is depicted below.

**1. PHASED CATCHMENT AREA TREATMENT (Area in Ha.)**

**Phase-I**

	Area in ha.	Treated by NVDA	Covered under Comp Plantation	Total area treated up	Balance Area proposed to be treated by State Forest Deptt /NVDA
Non-forest	49837*	49598	00	49598	239
Forestland	11515**	4273	4587	8860	1833
Total	62,975	53871	4587	58458	2072

\* Revised targets as per micro planning( including unworkable area of 2090 ha)  
Earlier targets were 51,927 ha

\*\* Revised targets as per micro planning (including unworkable area of 822 ha)  
Earlier targets were 11,048 ha

**Phase-II**

As per stipulations, schemes for treating the Phase-II area are required to be prepared & submitted to the funding agencies like RVP/ NAED Board of MOEF/Various other ongoing schemes of the central/ State Govts. The progress achieved is about 2.26% as depicted below.

	Area in ha.	Treated by NVDA	Already treated under other schemes	Schemes submitted	Balance Area remained to be treated
Non forest	806720	20734	00	Not available	
Forest land	108430				
Total	915150	20734			894416

During the last meeting it was informed by the NVDA that progress is behind schedule due to non availability of the required funds of the order of Rs. 645.59 crores

Members may like to discuss & review.

**(b) COMPENSATORY PLANTATION : Planning and progress**

Ministry of Environment and Forest vide letter No. 8-646-84-FC Dated the 7<sup>th</sup> Oct. 1987 permitted diversion of 41,111.97 hectares of forest land in Khandwa, Dewas and Hoshangabad districts for the Narmada Sagar Multipurpose Project. under Section 2 of the Forest (Conservation), Act, 1980, subject to the following key conditions that :

1. Compensatory plantation will be carried out over suitable degraded forest land double the diverted forest area in extent and in addition to the equivalent area in non-forest land. However subsequently the scheme for compensatory plantation submitted vide letter Nos. F.D /AAA/ AO/3 dated 13.11.1987, as detailed below was approved by the MOEF. However additional compensatory plantation over 150 ha. degraded forest was directed.
2. The areas will be surveyed, demarcated and declared protected forests and placed under the control of the Forest Department for compensatory plantation at the cost of the project. Areas not found suitable will be substituted by suitable area.
3. Forest clearance was to be done only upto 4 M below FRL.

District	Area in hectares diverted for ISP	CA target in Degraded Forest	CA target in non forest area	Total target in ha.
Khandwa	33,383	30,572	2,314	32886
Dewas	4,528	17,491	802	18293
Hoshangabad	3,678	22,739	2,842	25581
Sehore		-	1,247	1,247
Dhar		-	1,001	1,001
Khargone		-	1,937	1,937
Total	41,589	70,802	10,143	80,945
Revised Targets		70,952*	10,452**	

\* Targets revised due to additional works over 150 ha area as penalty.

\*\* Targets revised due to release of additional 308.47 ha of land.

### **Progress of implementation**

During 40<sup>th</sup> meeting it was pointed out that plantations raised as vegetative measures under CAT have been accounted for against the achievement of compensatory plantation target also. Thus, the same plantation area has been shown against the achievement of CAT target as well as compensatory plantation target. This was contrary to the directions of the Environment Sub-group. GoMP was requested to exclude the plantation areas covered under the CAT from the achievement of compensatory plantation.

The progress reported by GoMP by the end of June 2004 was 78,643 ha (forest area = 68,596 & Non forest area = 10,047 ha). However after deleting the targets covered under CAT programmes balance target works out as 6,943 ha. As per stipulations these areas were required to be planted up by Monsoon of 2005.

Progress on Assessment of the success of plantations giving survival percentage, year of count with species wise details alongwith progress on declaring plantation areas on revenue land as forest land under Forest Act of 1927 may please be presented.

### **(c) COMMAND AREA DEVELOPMENT**

The project on completion will provide annual irrigation to 1.69 lakh ha. The Command area comprises Forest: 10,055 ha; Grasses and pastures: 10,498ha; Cultivated land: 142,406ha; Culturable fallow : 8,116 ha; Barren:18,385 ha. As per direction of the Planning Commission, project proposals are required to include the command area development plan also. MoEF clearance of 1987 also required it. The forest clearance stipulated that tree planting should also be done on either side of canal road and foreshore of the reservoir and in the wasteland / vacant lands under the control of the Irrigation Department in the command area. The key conditions attached with the investment clearance were as follows.

- The State shall comply with the conditions as laid down in the O.M.No.3-87/80-IA dated 24.6.1987 and letter No.8/646/84-FC dated 7.10.1987 both issued by the Ministry of Environment and Forest while according the environmental clearance and the approval for diversion of forest lands for this project respectively for this project and ensure completion of Rehabilitation and Resettlement Plan in scheduled time with close monitoring as per requirements of Department of Environment and Forest.
- State will establish adequate network for ground water monitoring in the command within 2 years and the State should submit to Planning Commission the time frame for establishing such network with mile-stone achievements, duly vetted through Central Water Commission, for monitoring the same by Planning Commission
- State should draw up a detailed time schedule for completion within 5 years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area ( which is not already submitted to the Planning Commission at the time of seeking approval ) of the total command of this project.
- The State should draw up an implementation schedule segment-wise for completion of canal network, in such a manner that a segment of the canal network, taken up from head reaches, is completed in all respect so as to make the irrigation water

available, for the design potential of that segment upto the outlet in that particular segment;

The Government of Madhya Pradesh have submitted command area development plan, delineating the soil classifications and land irrigability in the Narmada Sagar Command Area showing the first three phases of irrigation development by area, the land irrigability map of the Narmada Sagar Command Area during 1986. Accordingly the implementation of the plan was to be taken up in three phases for completion by December-2007. The subgroup directed updating of this plan in line with the plans being developed for the SSP in Gujarat and Rajasthan.

1. The study on impact of Agro chemicals, runoff from fields on surface & ground water quality in the command area was assigned to J.L. Agricultural University, Jabalpur. Results may please be presented
2. However the progress on the canal system is very slow. Earth work has been completed only in the first 28 kms of the main canal and mostly completed in another 13.25km length. Work for most of the distributaries is yet to be started.

#### **Progress of Implementation :**

As informed during the 40<sup>th</sup> meeting a GIS based CAD plan was under preparation with the help of NIC, MAPCOST and Survey of India and experts from NCA. Preparation of a comprehensive command area development plan was entrusted to MITCON consultants of Pune at estimated cost of about Rs.40.00 lacs. A multi-disciplinary expert group was constituted by the GoMP to supervise and monitor the preparation of this plan. The consultant have already started the work and submitted inspection report. It was reported that work related to digitization being carried out by NIC with the help of MAPCOST, Survey of India, National Bureau of Soil Science was in the advanced stage

Members may like to review & discuss.

#### **(d) FLORA, FAUNA, & CARRYING CAPACITY**

The submergence of forestland will result in the creation of new and regenerated forest habitat, the establishment and improvement of wildlife sanctuaries, the greater availability of fresh water for irrigated forestry for wildlife. The MOEF conditions for clearance, as far as they related specifically to the Flora & Fauna, were essentially the same as brought under Sardar Sarovar Project.

The objective of the suggested studies was to assess the environmental impacts as a result of the Narmada Sagar Complex, consisting of the three dams: the Narmada Sagar, Maheshwar and Omkareshwar, to ensure minimal adverse effects on wildlife as a result of the project development works. Studies were entrusted to Wildlife Institute of India, Deheradun, Friends of Nature Society, Bhopal, Limnological studies to the Universities (Jabalpur, Ujjain & Bhopal). These institutes carried out studies with a view to address the above concerns and recommended certain mitigation measures, which included the following.

1. Key aquatic vertebrates species like **otter** was proposed to be restored and translocated. It was suggested to explore the possibility of capturing and translocation of impacted otters of Narmada Sagar into identified localities of the vacant niches in central Indian rivers.

2. Besides, a species restoration plan for **aquatic reptile (turtle)** was also suggested within the submergence zone and also in other stretches of the river with rocky structure and sandy banks.
3. The restoration program for **muggar crocodile** as being practised in other districts of M.P. was also suggested.
4. The studies of certain aspects of fisheries and reservoir sciences have been included in the Limnological studies being conducted by the three Universities of the State.
5. Since the topography in the reservoir area consists of rolling hills, the higher peaks to remain above the water surface level and constitute islands in the reservoir. In addition to these small islands, two large islands will be formed to the north and south of the Narmada River just upstream of the Indira Sagar Dam. These islands were required to be protected. As per suggestions of the Sub-group NVDA had presented a plan for protection which was required to be implemented.

i. **National Park / Sanctuaries for ISP areas :**

It was suggested that the severity of the impact resulting from direct and indirect losses could be minimised through restoration of some of the aquatic vertebrates and delineation of a substantial area of the contiguity forest which has similar conservation values that are being lost in submergence and to elevate its status to a protected area – a combination of a national park and sanctuary. Three new protected areas were proposed to mitigate the losses. This included Narmada National Park, Suryamaya Sanctuary and Omkareshwar Sanctuary, as per details given below. It was however informed during the 40<sup>th</sup> meeting that the issue for implementation of the recommendations was under consideration of the State Cabinet.

Name of the Sanctuary/Park	Area in ha.		
	As per WII	As per State committee	
Omkareshwar National Park	47522	25082	- 22440
Suryamaya Sanctuary	16370	17400	+ 1030
Narmada(Mandhata) Sanctuary	11996	6672	- 5324
<b>Total Area</b>	<b>75888</b>	<b>49154</b>	<b>- 26734</b>

Govt. of M.P. vide their letter No. F5/58/83/10/3 dated 29.05.1990, formed a committee for suggesting the steps and drawing up of the plan for conservation & management of wildlife for SSP & ISP both. It was reported by the NVDA that, to ensure that no villages are included inside the proposed area of National Park and Wildlife Sanctuaries, the areas recommended by the EIA report was reduced by about **35.23%**. i.e. instead of covering an area of **75888 ha** recommended by the EIA studies GoMP is willing to constitute protected area only for **49155 ha**. This may have adverse consequences to the conservation of Wildlife.

Members may like to discuss the resulting impacts and consider the issues on merit.

## **ii. Consideration for commercial fishing activities in the proposed sanctuaries / National Parks.**

During 40<sup>th</sup> meeting of the Environment Sub-group, GoMP requested the Sub-group to consider permitting Govt. of M.P. for fishing related activities like rights of development of fishery, entry, exploitation, transportation in the proposed protected area even after issuance of the notification. The request of the GoMP was based on the facts that once the areas were notified as protected such activities would not be permissible because the areas to be submerged would legally remain forest land covered by the provisions of forest conservation act 1980. The issue was discussed and it was suggested that this proposal be first got examined by the High Level Expert Group on Conservation & Development on Fisheries constituted by the NCA on the advise of the Environment Sub-group for such purposes. IIM has submitted the report which has been sent to the Party States for their observations. Response to this report is awaited. The meeting of the expert group, to discuss this report is proposed to be convened shortly and outcome shall be reported. It was suggested by the Environment Sub-group that the proposal submitted to the Sub-group simultaneously may also be submitted to the appropriate section of the MoEF. It was informed by Govt. of Madhya Pradesh that proposal was submitted to the Ministry of Environment & Forests.

Progress may please be presented by the GoMP for a review by the members.

## **iii. Protection for the wildlife moving out from the submergence area : Status and manner of felling of trees from the submergence area.**

A plan for felling was required, to ensure protection to wildlife. GoMP reported that felling was under progress in 300 compartments of forest areas, 407 Khasra from 24 villages besides private areas of 125 villages. It was further reported that by the end of March 2006, felling was completed upto 4 meter below the FRL. Environmental consequences of this large scale felling were documented to by the wildlife Institute of India in the EIA studies which called for implementation of mitigation measures, commensurate with progressive filling of the reservoir. Copy of the letter received from Wild Life Institute of India was enclosed with minutes of the last meeting.

Considering the above, the Sub-group during 38<sup>th</sup> meeting held on 10.3.2003 requested GoMP to initiate the process immediately for implementation of the recommendations within five months period; however implementation of the plan is yet awaited. During the field visit carried out during March, 2006 it was reported pending creation of parks/sanctuaries, skeletal staff has been put in place and expenditure is being incurred on procurement of equipments.

Present position may be reviewed by the Sub-group.

## **(e) SEISMICITY AND RIM STABILITY**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. The MOEF conditions for clearance, as far as they related specifically to the Seismicity and rim stability, were essentially the same as brought under Sardar Sarovar Project.

The Narmada Sagar reservoir has a gross capacity of 12,200 million cubic meters, or about 9.9 million acre-feet, by far the largest-capacity reservoir planned in the Narmada River basin. Therefore the issues of Seismicity and the potential for reservoir-induced seismicity (RIS) were required to be attended as per recommendation of the dam safety review panel, Central Water and Power Research Station, (CWPRS) Pune and Indian Meteorological department (IMD), which suggested:

To monitor seismicity during the pre and post-impoundment phases. Network of about five stations each be developed in the Narmada Sagar, Omkareshwar, and Maheshwar areas.

- To record the ground motion intensity and response of the dams for any significant earthquake in the vicinity, installation of three strong motion seismographs at each dam site.
- To record any significant ground motion that occurs during construction, one strong motion instrument near each dam site.

Accordingly, zone a network of 10 seismological observatories with sophisticated instruments was being established. It was proposed to monitor pre and post impoundment seismicity also at these seismic stations to help in assessing the adequacy of seismic parameters adopted for designs. The location of these seismic observatories was as under:

1. Narmada Nagar	2. Omkareshwar (Kothi)	3. Maheshwar	4. Khandwa	5. Indore
6. Barwani	7. Bagli	8. Kannod	9. Hirapur	10. Chhanera

In addition, to monitor local activity in and around Pandhana, one unit at Pandhana in Khandwa has been established. The complete package of seismic digital and analog recorders and sensors have been procured and installed at 10 observatories station. Man power has been deployed for day-to-day operations, maintenance and watch and ward of seismic observatories of ISP on contract basis.

It was informed that data was being recorded at all the observatories except at Kannod and IMD has taken over monitoring station located at dam site for acquisition of data and its analysis.

Considering that reservoir has been impounded up to an EL 245.13m, out come of the data analysis carried out by the identified institutions for the ISP regarding reservoir induced seismicity during progressive filling of the reservoir may please be presented.

Members may like to discuss and review.

**(f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, specific requirements for the ISP contained in the environment clearance order of GOI were essentially the same as brought out separately under the Sardar Sarovar Project.

The Indira Sagar Project would create a 913 km<sup>2</sup> reservoir and shall have , a main canal of about 332 km. and 1,820 km of distributaries. Surveys and investigation of the existing levels of health, information on specific diseases besides implementation of the planned measures in time were required in accordance with the order of clearance.



Three specific diseases namely Malaria, Schistosomiasis, and Filaria were studied and diseases like leishmaniasis, scabies, etc., were investigated. The geographical reconnaissance study, to identify the potential breeding sites of malaria vector, was suggested. Other key suggestions included

1. Measures to control schistosomiasis should include physical, chemical, and biological means. The biological mitigation measures would include the use of predator species that would eat the secondary host snails.
2. Since the Anopheline mosquito vector has the potential to proliferate in the reservoir, the large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Some experimental resistance of adult mosquitoes to commonly used biocides was noted under laboratory conditions. Thus research to maintain effective biocides was to be continued on long term basis. Land leveling and land filling operations as well as appropriate vegetation clearing are being integrated. Control measures was to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites.

In pursuance the NVDA was required to update and implement the plan on health aspect for ISP. A copy of the plan was received from the NVDA. It covered the up-stream, dam site, command area and the rehabilitation sites of the Indira Sagar and Omkareshwar projects. The plan estimated to cost Rs.6.49 crores included provisions towards ISP for 30 bedded hospital at Punasa, 1 mobile unit, 29 Sub-Health Centers, 2 Public Health Centers besides strengthening of 6 existing health sub-centers. Provisions for IEC, control of Arthropods, provision of insecticides and surveillance were also incorporated. Observations of the ICMR on the health plan identified gaps in plan. These were annexed with the minutes of the 40<sup>th</sup> meeting. In the absence of required presentation, the Committee which visited the areas in Madhya Pradesh could not review the progress on health issues.

Status of compliance / implementation of the plan may please be presented, for perusal /observations and review by the members.

#### **(g) ARCHAEOLOGY**

In addition the general obligations of the State under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out under the Sardar Sarovar Project

Investigations of the basin revealed that valley was rich in archaeological belongings. A survey of the 254 villages for identification of the archaeological monuments falling within the submergence area was carried out by the State Department of Archaeology and Museum, Bhopal. The current status of monuments is as below.

- 254 villages surveyed for identification of Archaeological monuments coming under submergence.
- 8 Nos. of monuments have been identified which require relocation/ protection.

- 153 statues have already been collected and preserved at Museum at Dewas, Hoshangabad and Khandwa.
- Shiv Mandir Dharikotla has been relocated to Sarlaya R&R site
- Archaeological Survey of India has also resurveyed 167 villages for identification of the monuments of significance.
- Archaeological Survey of India have prepared a plan for protection of monuments coming under the submergence of Narmada Sagar Complex area. According to this plan, the well situated in the midst of north bastion of Joga Fort, a centrally protected monument, will be fully submerged at FRL + 262.10 M. However, this will remain submerged for 2-3 months during monsoon when reservoir might be at FRL. As far as backwater effect is concerned, the temporary rise due to backwater will be about 0.60 M near well, above HFL.

During 40<sup>th</sup> meeting it was informed that NHDC has prepared an estimate of Rs.25.00 lacs for construction protection wall which has been approved by the Archaeological Survey of India and that NHDC was directed to carry out the work latest by Sept. 2004. It was reported that the work has been completed by the NHDC.

Further progress on re-survey being carried out by the ASI, protection of other identified monuments may please be presented for a review by the members.

#### **(h) ANTHROPOLOGY**

The Narmada Valley can be divided into three physiographic units (1) Western Vindhya (2) Narmada through West and South and (3) Western Satpuras. Some Indologists place the Narmada-Chambal civilisation of Malwa as a contemporary of Indus civilisation. Navada Toli is a site contemporary to Harappa where evidence of early farming villages were discovered. Findings of a hominoid skull from Hathnora indicated the possibilities of the existence of human bio-cultural remains within the basin. Excavation of the early historic mound in village Khedinama in Hoshangabad district was completed earlier during 1993-94. Ancient tools and artifacts were found. The entire area was scanned by the Anthropological Survey of India under Narmada Salvage Plan. NVDA has also planned to establish a Center on Religious and Cultural heritage of the Narmada Basin. Further progress may please be presented.

After detailed studies NVDA prepared a plan for excavation of five sites in District Dewas, Khandwa. As per the information received from the NVDA excavation works on all the five identified mounds was completed by the State Archaeological Department after taking permission from the Archaeological Survey of India.

A report on findings of the excavations may please be presented for a review by the Members.

#### **(h) ENVIRONMENT MANAGEMENT OF DOWNSTREAM AREAS :**

Management of downstream areas especially with reference to requirement of environmental control focusing on aquatic eco-system, health hazards, quality of water & its suitability for designated uses, Disaster Management Plan is required. The Environment Sub-group during its 38<sup>th</sup> meeting also suggested adequate safeguards for the downstream environment. In response the copy of the Management plan for downstream environment was received from NHDC alongwith rules for operation of

reservoir. Subsequently a copy of the disaster management plan was also received. these are under scrutiny. It was further informed by the NHDC that the District Administration of the Districts situated downstream contact NHDC officials for regulating releases from the ISP during festive seasons on Narmada River and that required measures such as beating of drums, warning messages, besides law & order is maintained. The mechanism in place to ensure quality & quantity of releases w.r.t implementation of required environmental safeguard measures may please be presented by the Govt. of Madhya Pradesh and NHDC.

**Item No. XLIII-5(203) : SHARING THE COST OF THE TREATMENT OF FREELY DRAINING CRITICALLY ERODED CATCHMENT AREA.**

Catchment area treatment was one of the condition stipulated by the Ministry of Environment and Forest, Government of India while according clearance to SSP. Subsequently the Committee of Union Secretaries decided on 3.7.1992, that only the treatment of critically degraded areas which drain directly in the reservoir (**Phase-I**) should be charged to the Project and shared by the party states. However, the proportion in which this cost is to be shared is the issue on which there are divergent views. Discussions on this issue have been held in various meetings of NCA and RCNCA since April, 1989. The matter was discussed in the 12<sup>th</sup> RCNCA meeting held on 9.9.2004 wherein the Govt. of MP desired to discuss the cost sharing aspect of the CAT of phase-II area also as it has direct bearing on the cost sharing aspect of the CAT of phase-I. The issue was referred to the Environment Sub-group. The Environment Sub-group invited views of the party states for consideration of the issues involved. Response received is under consideration of the Ministry of Environment & Forests.

Targets and achievements of the treatment of phase-II CAT of SSP is as below :

<b>Phase-II Plan</b>	<b>Area</b>	<b>Achievements</b>
<b>Govt. of Gujarat</b>	<b>657 ha</b>	<b>Completed</b>
<b>Govt. of Maharashtra</b>	<b>77,568 ha</b>	<b>20,861 ha</b>
<b>Govt. of Madhya Pradesh</b>	<b>3,18,118 ha</b>	<b>35,312 ha</b>

This is for information.

**Item No. XLIII - 6 (204) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS. [Deferred agenda of the previous meeting No.XLI-4(187)]**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

**1. Phase-I Establishment of Silt Monitoring Stations.**

In pursuance to the recommendations of the Environment Sub-group for establishing silt monitoring stations to assess the efficacy of the treatment works Sardar Sarovar Narmada Nigam Ltd., decided to entrust this work to Central Soil & Water Conservation Research & Training Institute, Vasad. Studies carried out by the Space Application Research Centre, Ahmedabad through satellite imagery for the period 1985-86/ 1994/ showed that there was considerable improvement in the conditions of the catchment. Data pertaining to 2002 was got analysed and made available by the SSNNL. During last meeting it was directed that dedicated focused monitoring for assessment of the CAT works is a continuous process and arrangements made for the same should be continued. Progress as available in this office is presented below.

- One interim report was received during 2002. Further progress on silt monitoring works entrusted to CSR & TI is awaited from Govt. of Gujarat.
- Report on periodical updating of the focused studies carried out for the sub-watersheds already treated, through FSI was awaited from Govt. of Maharashtra.
- GoMP was taking steps for entrusting the studies to CSR & TI. Progress may please be reported by the GoMP.

**2. Phase-II Submission of Catchment Area Treatment Plans and implementation.**

As per the decision of the Govt. of India of July, 1992, State Govts were required to submit schemes for treatment of critically degraded sub-watershed other than directly draining as Phase-II programme to the funding agencies for completion of work in a time frame to be determined separately. Available progress is presented below for updating by the concerned states.

Phase-II Plan	Area	Achievements
Govt., of Gujarat	657 ha	Completed
Govt., of Maharashtra	77,568 ha	20,861 ha
Govt., of Madhya Pradesh	3,18,118 ha	35,312 ha

It was observed during the 35th meeting that due to decentralization of the funding components of the watershed management schemes and placement of funds at the disposal of the respective State Govts, needed steps should be taken by the States for continued support to the soil moisture conservation works as envisaged. It was however informed that the progress on treatment of Phase-II areas of catchment was very less due to inadequate financial commitment received for treatment of the Phase-II areas. State Govt. therefore requested for help from the sub-group for obtaining funds for treatment of the Phase-II works.

Members may like to discuss & review.

**B. MONITORING WORKS IN MAHARASHTRA**

**Agency for Inter Departmental Coordination for effective implementation of the plans in time and funding of the works on implementation of action plans for mitigation of adverse impacts on environment.**

In pursuance to the recommendations of the Environment Sub-group during 40<sup>th</sup> meeting a series of steps were taken by the Govt. of Maharashtra and Environmental Cell for strengthening Inter Departmental Coordination has been formed. Progress on appointment of Staff, provision of funds, A report on activities of this cell and expenditure incurred thereon may please be presented by the Government of Maharashtra

**C. SARDAR SAROVAR PROJECT : PUBLICATIONS / SEMINARS ENVIRONMENT MANAGEMENT**

During earlier meetings it was desired that good works being done by the Project Authorities are to be published. Publication brought out by the project authorities were presented and It was informed earlier that the thrust areas have been identified for publishing success stories. Further progress may please be presented by Gujarat, Madhya Pradesh and Maharashtra.

**D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

In order to frame yard sticks on the cost estimates of the water resources Projects, the Chairman of the Sub-group during desired compilation of the estimates and expenditure incurred on survey, studies and implementation of the suggested safeguard measures for the SSP / ISP. Updating of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level is requested from the Govts. of Gujarat, Madhya Pradesh and Maharashtra.

**Item No. XLIII-7(205) : Any other item**

**Date and venue of the next meeting**

# ANNEXURES



## ANNEX - XLIII-(1)

Dear Dr. Pawan Kumar,

I received the Draft Report of the Fourth Field Visit of the Committee, Environmental Subgroup, NCA and noted the contents. I regret to note that the Report is silent or clearly wrong on many matters of concern including micro canals, micro drainage, groundwater, conjunctive use etc. The Report to be submitted to the Subgroup as per its direction, should be clear with reference to observations at site and should not white wash the obvious failings. I regret to strongly disagree with the draft. In case it is to be submitted to the ESG with out major modifications, this note of dissent with enclosures along with the Report may be submitted to the Subgroup as well as the Chairman, ESG for their consideration.

#### COMMENTS ON THE SITE VISIT

##### 1. Site Visit to Command Area on 13/6/05.

Minors, Sub minors, field channels and controls are essential for proper distribution of irrigation water to the fields. It was understood that they were ready only for two sites proposed for visit. During the field visit (reported as Demonstration, but in reality a visit to actual sites since otherwise the visit is meaningless at this juncture) the embankment of the canals have not been compacted, the field channels had been crudely scraped and not dug and there were no controls at all, and so the micro channel system for delivery of water to the fields is not functional. In the Meeting on 15<sup>th</sup>, Chairman and MD, SSNNL informed the Committee that the plans for micro channel system will be ready in 3 months time. The implementation of any such plan is a prerequisite for proper irrigation and environmental control.

2. No details of field drainage systems seem to exist. Only old drainage channels were seen in the fields and there seems to be no record of the micro drainage system, verification and validation of their capacity, outfall and adequacy or design for integration of these with the surface water drainage system reported to be developed under the SS Project ESG has been repeatedly informed that action is in progress in this regard. It is too late now to claim that they are unnecessary or that WUS will take care of them at their whim and pleasure.

3. It is reported that WUS/field agencies will take care of ground water development and conjunctive use. Obviously SSNNL seems to operate as a Surface water agency and there is no coordination at all with respect to groundwater development. There is no detailed plan for development of groundwater at the village or command area/WUS level and in the absence of even a joint use plan at WUS or slightly higher level, conjunctive use planning does not arise at all. There seems to be only a lip service to the concept of conjunctive use of surface and groundwater. Integrated coordinated development of surface and groundwater is essential for optimal development of the limited water resources of the region. SSNNL and NCA cannot give up their responsibilities in this regard. It is unfortunate that even in areas of poor drainage and saline soils, action plans and designs at field level for coordinated development of surface and groundwater along with the relevant micro drainage systems do not seem to exist even though they are essential for optimal

development and control of environmental impacts of irrigation.

4. It is learnt during the field visit that there were a number of occasions with no downstream release at all which is a breach of the ESG direction and SSNNL undertaking that a continuous minimal release of 600 cusecs is to be maintained for the present pending further studies as per the recommendations of IH, Wallingford. The Chairman and MD, SSNNL was kind enough to assure the Committee that the minimal flow will be ensured. Studies and action plans suggested by IH, Wallingford need to be completed expeditiously to identify, evaluate and implement adequate measures for downstream environmental control.
5. Gujarat had completed tree felling as required and yet because of delays in the project generally beyond its control, 10 year or older coppice growth is present in the submergence areas. Only around 30% of felling of this seems to have been completed. Further more tree felling in submergence areas of Maharashtra was seen to be very much incomplete and there seems to be some legal problems with reference to tree felling and coppice growth removal in the expanded Shoolpaneshwar sanctuary. ESG should look in detail into the various aspects of the problem and take definitive decisions.
6. Water available for Gujarat as per Narmada Tribunal Decision is significantly smaller than required by Gujarat plan for water resources development in Gujarat in Narmada Basin. Clarification to remove inconsistencies is needed to ensure the development is realistic and as per decision of the tribunal.

These lacunae are serious and are considered to be the result of not realising the necessity to implement the last km of the surface water distribution system, the first km of the field drainage system and the groundwater system and D/S control which are essential for proper irrigation, drainage and environmental control. If the field organisations are serious, there is no reason why they cannot be successfully tackled in a years time.

Kindly send me copies of detailed Water Delivery and Drainage Plans with necessary topographic details at microlevel at least for some of the areas as well as other documents promised as and when they are received.

My specific observations on the Draft Report are given in the enclosure.

With best regards,

Chennai  
10/08/2005

Yours sincerely,  
Ramaseshan

p.s. Please ask for clarifications as needed in case of difference with field data.

SR

## DETAILED COMMENTS ON DRAFT REPORT

Page	Line	Details
3	2	"slit" to "silt"
	25	"Phase-II Programme" is used for CAT in noncritical areas. Its use for re treatment will cause confusion.
4	20	crop?
	24	"fully plugs" to "gully plugs"? gradonies?
5	7	Rajpiplanameat?
	25-27	Results ..... trend. Not true. Preliminary results for 2004, say for Kokam I & Kokam II watersheds (Tables 8&9) indicates a highly variable nature of data collected and need for lot more of careful observations. Event wise analysis rather than daily analysis, dependence on antecedent conditions and sediment routing models may lead to a better understanding of the process.
6	9	Add "preliminary" before "results" in "Considering the results presented" "..... the committe further strongly recommended that additional check dams/ nulla bunds should be taken up in such subwatersheds on a priority." The cause of heavy erosion has to be identified before solutions are suggested. Hence no such action is desirable as it will adversely affect the consistency of data collected in the sub watershed. This may be deleted.
9	7	"should be" to "may be"
11	21	Add "drinking water supply and" before "waste disposal".
12	7	..... in time. Add "It was noted that the coppice growth in Shoolpaneshwar sanctuary may be 10 years old or so and there seems to be some legal difficulties in their removal.
	19	"..... to be felled" Continue with "in Gujarat and there was no tree felling at all in the nearby Maharashtra area."
13	9	Introduce a section here as follows: 4. A policy for felling of trees or coppice growth in submerging areas of Shoolpaneshwar Sanctuary and Maharashtra is to be decided by the ESG.
14	2	"5) Groundwater .....resources" to "5) Groundwater development and conjunctive use planning."
	11 ff	Add Drainage Groundwater management and conjunctive use.
	29	"as demonstration plots". No: only a site visit since no plot was demonstrated.
	30	Add "said to be" after "where implementation of CAD plan was"
16	25	Replace "Groundwater studies and ..... conjunctive use" by "Groundwater development plans, coordination with surface water, conjunctive use and mathematical modelling."
17	13	Add at the beginning "There is no plan for surface drainage even in clayey, low water table and other problem areas. Existing micro drains do not seem to have been mapped or their capacity and outfall technically evaluated. It is necessary to have a proper micro drainage system draining into the surface drainage system of CAD. This implies that existing micro drainage systems are to be mapped; their capacity and outfall evaluated for technical adequacy; or else their capacity is to be increased or new drains designed and constructed so that a fully functional surface-water micro drainage

- system exists.
- 17 17 Delete "It was suggested ..... salinity" since there seems to be no basis or necessity for the same.
- 17 22 "even when it is uneconomical". This is a loose statement without any basis. to be deleted.
- 24-25 Replace "There is a need ..... conjunctive use" by "It is necessary to implement a well developed groundwater/conjunctive use plan, monitor the groundwater depth and quality and if necessary modify the development and use of water over time.
- 19 Add "Development of groundwater and its coordinated (conjunctive) use with surface water affects the optimal utilisation of the limited water resources of the region and also the environment significantly and so cannot be left to WUS. The management of the systems should be under the direct control of a field organisation even though the day to day operation of the system is with WUS. It is hence necessary to develop action plans for coordinated development of groundwater and conjunctive use and develop the same under a field organisation so that socioeconomic and environmental disasters can be averted.
- 19 8 "farmers" "WUA?"
- 31 Add "extremely" before "week".
- 24 Add a Section before "RECOMMENDATIONS" as follows:
- The concepts of village pond, grid etc are introduced now and are to be considered as enhancements outside the plan as no specific technical design, detailed plan and consistency checks seem to be available.
- Micro channels, micro drainage, groundwater development, water logging and salinity control, and conjunctive use are prerequisites for effective functioning of a proper irrigation system and for environmental control. While day to day operations may be left to WUS, they should be planned, designed and controlled by a responsible technical organisation.
- 20 2 Add "and drainage" after "irrigation".
- 3 Add before "for volumetric development" the following: "definitive plans for groundwater development, conjunctive use and devices and measures" Keep this as item 4.
- item 5 After "need to" add "design and implement a phased plan of groundwater development and conjunctive use of surface and groundwater and also". Keep as item 5.
- item 7 Replace it by "It is necessary to identify and entrust the responsibility of groundwater development, monitoring and control with respect to qualitative and quantitative issues to a specific field organisation with specific responsibilities of dynamic evaluation of groundwater resources, control of water table and groundwater quality. Move as item 6 and renumber earlier item 6 as item 7.
- 20 17 "proposed water grid". What are the technical details? Replace with "WUS wise water budgeting is to be prepared at the micro level.
- 30 "replace "measure" to "release a controlled"
- 21 7 Add "tentatively pending further analysis" before "to maintain a"

From Dr. R.K.Katti  
Prof. Emeritus, I.I.T. Mumbai  
Expert Member E.S.NCA.  
x-1, RH-4, Sector 9, C.B.D. Belapur  
Konkan Bhavan P.O. Navi Mumbai  
400614, MH.

Date: 20<sup>th</sup> June 05

To,  
Dr. Pawan Kumar, Director (Environment )  
Narmada Control Authority,  
116-BG, Scheme No. 74-C Vijayanagar,  
Indore-452010  
(Tel.0731-640910, FAX 0135-640117)

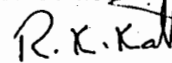
Subject: 4<sup>th</sup> Field visit of the Committee of environmental sub-Group of  
Narmada Control Authority to the areas in Gujarat.

Dear Dr. Pawan Kumar,

As promised I am enclosing my observations on above subject in the form  
of a write up. I hope it will help you in drafting your report.

With kind regards,

Yours sincerely,

  
(Prof. R.K.Katti)

encl: as above

17

**OBSERVATIONS ON 4<sup>th</sup> VISIT OF THE COMMITTEE ON ENVIRONMENT  
FOR SSP, AFTER UNDER TAKING FIELD VISITS FROM 12<sup>th</sup> JUNE  
THROUGH 16<sup>th</sup> JUNE 2005**

BY  
**PROF. R.K. KATTI, PROFESSOR EMERITUS, IIT, BOMBAY  
AND  
EXPERT MEMBER ENVIRONMENTAL SUBGROUP, NCA**

After assembling at Baroda the meeting started by Dr. Pavan Kumar to brief about the field visit and subsequent proposed meetings.

The field visits took place right from the morning of 13<sup>th</sup> and ended at 11.30 a.m. on the 15<sup>th</sup>. It was followed by around two hour meeting shri P.K. Laheri, Chairman and M.D., Saradar Sarovar Narmada Nigum Ltd., along with his colleagues representing various departments.

During meeting following points were brought to the notice of the S S P authorities. Some points are inescapable and need immediate action and some other points may have technically adequate time to and thus initiate action in a systematic way providing transparency in the system.

The points are

- ✓ (1) Safeguarding interest of down stream users and environment consisting of flora and fauna. This is inescapable
- ✓ (2) Complete the felling of trees in the entire submergence area before filling up to 121.92m. this is inescapable
- ✓ (3) Micro planning of the command area with respect to distributaries, branch canals, minors, field channels, leveling of fields, efficient distribution with minimal losses, crop pattern based on soil and water table conditions, and drainage to prevent water logging and also providing improved environmental protection based on scientific estimation and quantification. As the area is already under some type of semi irrigated mode for cultivation there is some breathing time available for implementing improved method of command area development.
- ✓ (4) Assessment of efficiency of catchment area treatment by well programmed field experiments, laboratory experiments, and in depth analysis to predict the erosion, of various geomorphic features and forecast cover, nature of siltation and the corresponding period

**Point (1) Down stream environment:**

To protect the down stream user interest and also fish, flora, and fauna it is inescapable to provide minimum flow of 600 cusecs from the dam even during lean period round the clock as agreed to by M.D. during environmental subcommittee meeting held at Delhi.

Response to this point by the chairman was positive and promised to take immediate action.

**Point (2) Felling of trees :**

Before next filling of the dam when it reaches 121.92m., it is inescapable to complete the felling of the trees in the entire submergence area up to 121.92m. irrespective of jurisdiction of the location. The state of Gujarat may complete their part of the assignment, however there is a need to put extra effort on part of N.C.A. and MOEF in terms of needed assistance to complete the environmental requirements and prevent breaking up of unknown epidemics.

Chairman S.S.N.N.L. has taken this point seriously and volunteered to impress his counter parts from other concerned states

N.C.A. and MOEF may take active interest in resolving the hurdles.

**Point (3) Micro plan of command to be brought under irrigation:**

There appears to be some miss match between the data on expected irrigation potential in terms of acreage as per tribunal award computed by N.C.A. as per standard textbook approach and that provided by SSP and S.S.N.N.L. without providing back ground concept based on over all state approach to irrigation philosophy.

The chairman, SS and SNNL. requested for adequate time to clarify the apprehension based on state wide irrigation concept appreciated by Hon. central irrigation Minister Mr. Sharad Powar

The concept used is networking village ponds, irrigation channels, bore well points to draw underground water, in the entire state and produce a water grid approach to provide for drinking water, irrigation, industry and for other purposes in an integrated way. Conduct scientific analysis for optimum allocation of water and utilization with maximum economic and welfare benefit to the state.

#### SOURCES FOR STORAGE OF WATER AND DISTRIBUTION :

Village ponds are /will be suitably designed to store water and distribute it. Sources for storing water are :

- (I) Rain water,
- (II) Excess water from irrigation channels,
- (III) Direct water from reservoirs through canal systems,
- (IV) Underground water drawn by bore wells and joined to canal water based on the principals of conjective use or directly delivered to village pond or to drinking water delivery system etc.
- (V) During floods direct water from the rivers through appropriate available delivery systems.

#### WATER AVAILABLE FROM SARIDAR SAROVAR :

In the present scheme the water allocated from SSP will be suitably to water grid/net work and will be used as supporting the irrigation system.

Thus with the help of SSP water irrigation potential will be increased by conjective use of village water pond net work. The village pond envisages conjective use of not only mix of irrigation water with ground water but other water stored and flowing to the ponds as a part of grid net work.

#### PRESENT STATE OF FARMS IN THE NARMADA COMMAND :

Most of the farms in the Narmada CAD area are leveled and having kachha water channels to deliver water, transfer from one field to another down below and drain the excess water through *kachha drains* to *nallas* etc.

The Government of Gujarat intends to convert kachha minors and drains in to concrete minors and drains as demonstrated in two locations.

Farmers are well aware of ill effects of water logging, salt efflorescence, and convert the present farms to raise crops needing high duty of water and may give short term economic benefit.

#### EXPLOITATION OF UNDER-GROUND WATER RESOURCES THROUGH BORE WELLS

A large number of bore wells are drilled and operated by private owners. However to control water table and excess drawing of water from a given water shed some mechanism needs to be established. There is a need to restrict the number of bore wells to be allowed to be drilled and operated. There is need to assess the ground water potential and probable yield from each water shed in the command area and project a rough figure of quantity of water available in the entire command area.



For accountability and transparency SSNNI should provide a micro level plan based on their water grid based water budgeting for proposed Narmada command area to environmental sub group. For this exercise some breathing time is available.

Forest department has done yomans job with respect to plantation along sides of canals and developing sanctuaries and some spots in the sanctuary are unique and can developed as tourist spots. There is a need to develop exquisite sanitation ,water supply ,communication and road system. There is no harm in developing for five star tourist. This establishes proper level of sanitation. Although external architecture should merge with local scenario ,inside should have modern comforts. Private parties may be better suited to manage such activities. They have developed a management system involving VSA and WUA.

**Point(4) Assessment of effectiveness of catchment area treatment:**

Unless the experiments are designed taking in to consideration all parameters affecting the erosion and siltation the exercise may lead to erroneous conclusions. To assess correctly the time needed for different degree of siltation of the reservoir there is need to conduct in depth analysis taking in to account various variables. It is advisable to provide adequate funds to obtain authentic prediction. Proper stations be established to conduct such studies.

**Annexure- XLIII- (2)****Key stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India**

- (i) Until approved plan for environmental safeguard measure is implemented water should not be used for irrigation purposes.
- (ii) Command Area Development Plan & Implementation of the water delivery and drainage system along with implementation of the measures proposed in the plan for safeguarding the environment. In addition the Environment Subgroup has issues directions from time to time for guiding the development of Command area Development plan
- (iii) Command area involves both the management of plant as well as human aspects. The details have to be collected on the following:  
Existing land use, irrigation status, cropping pattern, water availability-surface and ground; natural drainage pattern, induced drainage, yield, permeability, precipitation distribution, salinity and alkalinity problems, soil profile, land capability.  
  
Cropping pattern, rationale and controlled water use; training for skills up gradation; package of irrigation water, seeds, fertilizers, insecticides, pesticides with controls; surface and subsurface drainage.
  - 1) Land capability survey of the area which are proposed to be brought under irrigation along with the soil profiles;
  - 2) Identification of the areas prone for water logging and salinity;
  - 3) Details of the drainage works proposed in the command and the norms based on which these details have been planned;
  - 4) On-farm development works proposed and the assistance proposed to be given to the farmers to ensure conjunctive use of water;
  - 5) Details of the present and proposed cropping pattern;
  - 6) Steps proposed to prevent contamination of ground and surface water due to fertilisers, pesticides, runoff.
- (iv) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and in the wasteland/vacant land under the control of the Irrigation Department
- (v) A programme of drainage and ground water balance studies has been completed for Mahi Narmada-Doab. Such a programme must be completed for the areas beyond the Mahi. The Bhal, Saurashtra, Kutch. Sami-Harij and other areas require this as a pre-condition.
- (vi) The State should set up a special group of experts to study the siltation aspect in the main canals under all operating conditions since such siltation, if occurs, is likely to pose a serious problem during the actual operation of this project and may require a huge expenditure for desilting as well as result into serious operational difficulties.
- (vii) State should draw up a detailed time schedule for completion within five years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area of the total command of this project.
- (viii) Past experience of Irrigation projects have revealed that main and branch canals are completed up to the end but, in absence of micro-level networks to take irrigation water up to outlet, corresponding Irrigation benefits do not start

accruing In spite of huge financial investment made. To avoid this, the State should draw up an implementation schedule, segment wise, for completion of canal network, in such a way that a segment of the canal network, taken up from head reaches is completed in all respects so as to make the irrigation waters available, for the designed potential of that segment, up to the outlet In that particular segment.

(ix) Key issues identified by CAD wing of MOWR are as below

- i. Modernisation, maintenance and efficient operation of the irrigation system up to the outlet with discharging capacity of 30 litres per second (1 cusec approx.).
- ii. Development of field channels within the command of each outlet to distribute the water efficiently.
- iii. Land levelling and shaping on an outlet command basis for even distribution of water over the field and to achieve economy in water application.
- iv. Enforcement of a proper rotational schedule of irrigation water delivery for fair distribution of water to each farm holding.
- v. Selection of suitable cropping pattern so that minimum quantity of water may give better results.
- vi. Strengthening of the extension services to disseminate knowledge of optimum water use among the farmers.
- vii. Use of wireless network for proper regulation of water for crop use.
- viii. Construction of field drains in the outlet commands.
- ix. Development and maintenance of the main and the intermediate drainage system.
- x. Promoting conjunctive water use through the development of groundwater for supplementing surface irrigation.

**ANNEX - XLIII-(3)****Tabular Statement on status of Command Area works in Phase-I, in Gujarat.**

S. No.	Suggested actions	Incremental Planning	Annual Targets		Achievements	
			Phy	Fin.	Phy.	Fin.
1.	<b>Agriculture Development</b> <ul style="list-style-type: none"> <li>• Water course and field channel</li> <li>• Land leveling and shaping</li> <li>• Field drains and chak drains</li> <li>• Support and assistance to farms in development of ground water in conjunction with the surface water.</li> <li>• Network of approach roads and eventually farm roads</li> <li>• Marketing and warehousing.</li> <li>• Establishment of agri cultural, research-cum-demonstration farms.</li> <li>• Co-operatives or farmer-friendly structures for inputs and credit facilities.</li> <li>• Provision for supply of seeds, fertilizers, pesticides etc.,</li> <li>• Incremental Communication facilities</li> <li>• Incremental Municipal &amp; civil facilities</li> <li>• Consolidation of land holdings .</li> <li>• Agricultural extension activities.</li> <li>• Problems areas of Bhal and Bara track.</li> </ul>					
2.	<b>Public Health</b> <ul style="list-style-type: none"> <li>• Strict control on supply of water. (Volumetric supply)</li> <li>• Lining of canals</li> <li>• Surface drains</li> <li>• Drainage of borrow areas.</li> <li>• Training at levels</li> <li>• Presumptive treatment and</li> <li>• Curative treatment               <ul style="list-style-type: none"> <li>• NMCP</li> <li>• Strengthening of CHCs</li> <li>• Strengthening of PHCs</li> <li>• Strengthening of Sub Centers</li> <li>• Strengthening of Urban Health Services</li> </ul> </li> </ul>	Before commence ment of Irrigation				
				20 lacs		
				325 lacs		
				420 lacs		
				4 lacs		
				6 lacs		

3.	<b>Water quality :</b> <ul style="list-style-type: none"> <li>• Water quality monitoring wells.</li> <li>• Institutional arrangement for monitoring of surface water quality.</li> <li>• Ensuring releases of fresh water for diluting the pollutants.</li> <li>• Regulatory control for prevention of downstream environment by Municipal &amp; Industrial sewage.</li> <li>• Surface &amp; Sub-surface drainage in region -1 to 4.</li> <li>• Regulation for pesticides control. <ul style="list-style-type: none"> <li>○ Research Centers for Biological control.</li> </ul> </li> <li>• Integrated pest management.</li> </ul>					
4.	<b>Water logging &amp; salinity</b> <ul style="list-style-type: none"> <li>• Improving the quality of the soil maps</li> <li>• Volumetric supply of water through computerised system</li> <li>• Improving the design of drainage system. Re-use plan</li> <li>• Ground Water Modelling with new data.</li> <li>• Modelling of regions with rocky strata.</li> <li>• Operationalisation of the drainage studies</li> <li>• Special works on coastal zone.</li> <li>• Location of Piezometers / well</li> <li>• Integration of GWRDC wells in the command.</li> <li>• Institutional mechanism for monitoring water table / quality.</li> <li>• Legal/Financial frame work for utilization of ground water by the WUA for conjunctive use.(included in the cost estimates of the SSP).</li> </ul>					
5.	<b>Downstream Environment</b> <ul style="list-style-type: none"> <li>• Provisions for complimentary flows for mitigating pollutions in the downstream,</li> <li>• Restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone,</li> </ul>					

	<ul style="list-style-type: none"><li>Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality.</li><li>Developing of mathematical modeling for prediction of likely impacts of different operational scenarios for mitigation,</li><li>Studies on ecology and resources for the downstream environment, narrowing of river channel,</li><li>Legal agreement between the party states for regulated releases to ensure that project works as planned.</li></ul>					
6.	<b>Fisheries and Aqua culture :</b> <ul style="list-style-type: none"><li>Linking village tanks to distribution system in about 4,000 ha village pond. And other works from the budget of FFDA and Loan from Bank.</li><li>CAD plan on cost of SSP.</li></ul>					
	o Status paper	9.0 lacs				
	o Modification in capacity of ponds	9.0 lacs				
	o Major carp hatchery	15.0 lac				
	o Project cells.	9.0 lacs				
	• Control fouling from saline aquifers and agricultural chemicals.					
	• Monitoring responsibilities.	FFDA				
	• Arrangements for analysis of Monitored information	Commissioner(F)GOG				
7.	<b>Plantations in the command : Existing schemes. (1980-1992)</b>		Annual Targets		Cumulative achievements	
			P h y.	Fin.	Phy.	Finan.
	• Strip plantations	10,304 ha	Departmental work prior to SSP			
	• Common lands	12,213 ha				
	• Degraded forests	5,904 ha				
	• Degraded non forest	460 ha				
	• Community forest	29,000 ha				
	<b>Incremental programme (after SSP)</b>					
	• Canal banks	15,000 ha			2,900 ha	
	• Borrow areas	3,000 ha				
	• Community forest	40,000 ha			Nil	
	• Non culturable land	40,000 ha			Nil	
	• Field bunds	1,00,000 ha			Nil	
	• Farm Forestry	1,00,000 ha			Nil	

8.	<b>Flora and Fauna:</b> <ul style="list-style-type: none"> <li>• Development of Botanical Garden</li> <li>• Tree Preservation programme</li> <li>• Bio-Diversity Conservation Plan. <ul style="list-style-type: none"> <li>○ Environmental stability</li> <li>○ Coastal zone Eco-system</li> <li>○ Denuded areas in the Command</li> <li>○ Increase in tree cover by 5% (outside the forest).</li> <li>○ Measures for meeting MFP requirements.</li> <li>○ Awareness programme for people's participation</li> </ul> </li> <li>• Incremental Management of Nal Sarovar Environment</li> <li>• Incremental Management Valvador Environment</li> <li>• Incremental Management of Wild Ass sanctuary Environment</li> </ul>	Before commencement of the irrigation in the Command	Nil	Nil	Nil	Nil
9.	<b>Monitoring responsibilities in key areas and related training:</b> <ul style="list-style-type: none"> <li>• Environment such as Fisheries, Health, Ecology, Forestry, Agriculture, Horticulture, Veterinary, Extension Centre, Wild Life, Bio-technology, Soil etc.</li> <li>• Engineering such as Ground Water, Pollution, Salinity, Water Management etc.</li> </ul>					
10.	Arrangement for Data Management (GIS) for Managers of the project in future years.					

## ANNEX - XLIII-(4)

Dear Dr. Pawan,

I am sending you here with my comments on the Report [EIA & Management] on development of command area of SSP in Rajasthan for being put up to the Environmental Sub Group of NCA for its consideration.

With best regards,

Yours sincerely,

May 12, 2004

Dr. S.Ramaseshan

### **Review of the Report (EIA & Management) on Development of Command Area of SSP in Rajasthan**

The Executive Summary and Report on "Preparation of Detailed Project Report for Revised Plan of Utilisation of Narmada Water Allocated to Rajasthan" were reviewed. The Review Report follows :

The Report reviewed is only a preliminary proposal for preparation of the Detailed Report and not the Detailed Report. It has a number of ideas that may and probably will not work. No detailed analysis, design, testing or simulation has been done to validate several important components of the proposal. In the absence of the above any of the suggestions for detailed design cannot be adopted without further detailed investigation vis a vis other feasible alternatives.

In particular, before the irrigation of problem soils is considered it is necessary to work out the following to avoid future catastrophe.

1. The details of application of irrigation supplies to the field (perhaps from the diggies) for different crop sequences and soils in terms of frequency, depth of application and GW or SW;
2. Operation of the canal / GW system, if necessary to fill the diggies.
3. Simulation of canal and SW irrigation system;
4. Simulation of Groundwater aquifer in terms of quality and quantity;
5. Salinity control in terms of field testing and some soil/water quality simulation; it is seen that no flushing dose or drainage is provided implying no removal of salts;
6. Justification is needed for irrigation with poor quality groundwater without dilution. Loose spreading of Gypsum without proper control is not a technical solution for salinity control. In the absence of flushing and surface-drainage how is the salinity controlled ?



## COMMENTS ON EXECUTIVE SUMMARY

Page	Line	
(ii)	3	"It has been examined that this the mixing will keep the irrigation water within the permissible limits". What are the details for this conclusion ?
9	11	107.4            107.29 MCM (per year) [p. 1-6 of the Report]
17	24-26	The critical factor .....WUA's How do you ensure technical coordination and control within and among WUA's?
18	9	will .....will.....will.....An institutional support system..... How to ensure these ?
	27	"came" to "come"
20	27	".....will be problematic....." What about cattle crossings, ramps etc?
21	8	has <u>and</u> special            ?
30	7-10	What are the responsibilities, authorities and control infrastructures of WUA?
	13	it is proposed to plant trees..... Is this a specific and well defined technical solution ? Who is responsible for design and implementation of this activity?
	17-20	Where are the plans and budget for Water supply and sewerage since these have significant environmental implications?
31	18	Two observations per well per year is very inadequate for seasonal groundwater irrigation in problem soils with highly varying precipitation.
32	4	through evaporation ?
	14	{ }need to be worked out precisely and strictly adhered to for high { }productivity
	16-17	{ }are likely to come up.... and shall be tackled by conjunctive use of { }canal and ground water. What are the mechanisms, infrastructure and control provided for these objectives ?
34	6	Exact points..... This is OK as a general practical necessity; but what about zonation for Sampling?
	10,14	i)and iv) seem to be contradictory. What about SW level measurements for GW modelling?
	28	at the time of sampling Who identifies the need and on what basis?
36	2	Maximum = 100 Not at all sufficient. See note on P31 1.18
	3-23	What are the Base Survey results ?
	19-23	What are the existing conditions for water borne and water related Diseases? Where is the plan and system for monitoring water borne diseases? Who, what and how often the data are identified, validated, analysed and reported?
37	6	rapid.....EIA studies. Not enough. The studies should be comprehensive, detailed and dependable to monitor and control irrigation of problem soils.

7. There is no control or coordinated planning of groundwater utilization particularly when the quality of water is poor and the soil is of very poor quality;
8. Conjunctive use is not the joint use of SW and GW suggested in the proposal;
9. Irrigation of class IV . V and salt waste needs justification in terms of economics, practicability and of avoiding environmental degradation;
10. Economics of proposed irrigation system including sprinkler/drip irrigation pumping of groundwater of poor quality in problem soils, etc. is to be worked out;
11. Much more detailed plan, design, testing, analysis and simulation as well as field testing of proposals are needed before the environmental impact of the system can be considered; and
12. Proposed system for monitoring GW levels and quality are thoroughly inadequate. They seem to pay only a lip service to the concept and need thorough revamping. Perhaps a drastic new look or a new approach to use water available for irrigation in Rajasthan is badly needed.

Any proposal for irrigation of problem soils needs specific details on

1. Field testing of proposed irrigation schedules on different problem soils.
2. Field irrigation schedules;
3. GW pumping schedules;
4. Canal wise design crop pattern, sequences, irrigated areas and irrigation plans;
5. Surface water, groundwater and drainage simulations including quality;
6. Planned salinity control;
7. Economics of proposed irrigation system taking into account the capital and running costs for sprinkler, pumps, power supply, labour, maintenance etc. in addition to the canal system; and
8. Details of monitoring and control systems to ensure that uncontrolled irrigation of problem soils with questionable irrigation practices do not lead to the destruction of the existing low level of productivity, and irreversible ecological and environmental damage. A loose WUA as it generally exists is not at all solution.

Details comments on the report follow:

## DETAILED COMMENTS ON THE REPORT

Page	Line	Details
1-3		Reservoir an area of 37000 ha. This is less than submergence at FRL of 37960 ha!
1-5		Revised plan now being evolved..... ?
2-10	1	most of the land can be brought under economic irrigation. This is to be proved.
	7	No conjunctive use; only joint use of SW and GW has been proposed.
	18	No problem is anticipated in all the soil types.....Not true. What is the justification?
2-33	Table2-12	Rajasthan State 2001 population 5.64.73.100 mistake
2-35	Table 2-16	Irrigated or proposed irrigation?
Annex 2.2-2	v	Adopted crops - Pasture . Is sprinkler irrigation of saline GW justified.
Page	Line	Details
3-1	24	approved norm & sanitation .. What are the treatment facilities planned?
3-3	17	Drought has been spelt as draught in a number of places
3-5	last line	filtered water supply - where is it provided for ? What about chlorination and other procedures?
3-7	4	directly from the canal. Why no specific facilities for cattle drinking has not been made and what are the canal bank protections to avoid damage by cattle ?
	10	16.5% is a loss to canal supply and a gain to groundwater. Hence no loss is assumed at all. How?
3-9	last line	need less water..... What is meant by this statement?
3-11	13	as well as salt balance. How?
3-13	last but 2	sprinkler pipes. Will it have no loss due to non beneficial consumptive use?
3-14	2-3	during the stage when crops can tolerate salinity. How does canal and GW supply and irrigation demand compare at this and other times? How is the operation of the canal designed, operated and controlled to meet the demands efficiently ?
3-18	last line	is likely to improve with passage of time. - Not possible unless flushing and surface drainage are implemented to remove excess salinity
Annex 3.3-1		Annual ET for what crop sequence? The equations assume that i. no rainfall contribution to meet crop water requirement. ii. no losses due to non beneficial consumptive use or evaporation. iii. No wastage from canal to diggies to pipes t sprinkler etc. These do not make sense. Further more no flushing dose is given. How is Salinity controlled?

- 4-4 6 No provision seems to have been made for cattle crossing.
- 4-8 1 This thriftiness. Seems to be present in the ideals assumed. How is power/irrigation going to be charged? How is wastage or abuse of water going to be controlled?
- 20 Conjunctive use. No conjunctive use, but only joint, uncoordinated use by several individual users is planned.
- 4-9 A close monitoring will be done for GW levels.  
Details of data collection, validation, storage & retrieval, analysis, Interpretation and GW modelling for quantity and quality are needed and there is no specific provision for many of these are available. Hence this is obviously an over statement.
- 4-11 10 there will be a self sustaining leaching effect. **HOW?**  
16 reduces environmental pollution. **HOW?**
- 4-13 9 salinity management **HOW?**
- 5.11 23 Conjunctive use - No. Only joint use is proposed.
- 5.12 10 State PHED shall be responsible for design of schemes.....  
Where are the treatment, distribution, sewerage, sewage treatment. Sewage disposal etc. schemes; personnel and financial provision for the same?
- 5-13 4-5 all this require constant and planned monitoring and simultaneous redressals in the best possible terms.  
A wonderful objective. But where are the plans, infrastructure and trained personnel for achieving these objectives. What about canal wise planning?
- Sec.5.4(iii) "cropwise and soilwise scheduling of irrigation has been worked out precisely" Where are the details?
- 5-14 2 proposed to be tackled by conjunctive use of canal and ground water.  
Only joint use without detailed plans are given. Whether the disjoint use Without mixing or dilution of saline water will work and the consequences are not studied. To meet the objective in 5-13 above, detailed planning and design are needed even to evaluate the project proposal.
- Sec.5.5(iii) "...shall be done as per need". In a problem soil area that the whole command is, it is necessary to identify and quantify clearly the need and steps and procedures for salinity control. There is no specific infrastructure for identifying and quantifying the needs or design, application, control and monitoring of the applications.
- Subsec.v "...Shall be encouraged. Use of urea will be discouraged....."  
With low irrigation rates, if urea will pollute groundwater, why will not The other fertilizers like Ammonium Sulphate. Calcium Aluminium Nitrate etc. will not contaminate?
- 5-16 1 "...soil testing before each crop season...." Where is the infrastructure for soil testing required at this scale?
- 5-17 (a) "...Irrigation frequency may be increased....."  
With low delta, how can irrigation frequency be increased without increasing non beneficial evaporation in a sprinkler irrigation system ?  
What are the proposed frequencies and depth of irrigation?

- 5-18 "Cropping pattern ... may change later ....."Then how are you going to control water application from SW & GW to ensure proper combination of crops, time and depth of irrigation, joint use of SW & GW and avoidance of calamities due to uncontrolled irrigation of problem soils?
- 5-20 3-5 "Gypsum may be applied .....given".  
Is this a technical solution to the serious problem of soil salinity in problem soils. It is necessary to work out in detail appropriate technical solutions with cost and provide appropriate infrastructure for implementing the solutions.
- Sec.5.20  
and 6-3 CGWB standards are for normal areas. In problem areas monitoring station density should be larger. One monitoring piezometer (hole!) per 800 Ha implies only 1 per diggie or WUA. Design of the observation and monitoring system has to be done carefully taking into account all important aspects and not just the distance from the canal.  
Monitoring involves not only collection of data, but their validation, storage, analysis, use in mathematical and simulation models to identify opportunities and threats as they evolve much before they become serious impediments to growth. There is no provision for these important activities.
- 6-3 21-23 The entire exercise of.....shall be the responsibility of the project authority.  
What is the infrastructure for interpretation of data and modelling as well as follow up?  
Only 2 water level measurements per year for a piezometer is indicated. Since seasonal GW pumping is a major component of the project and the rainfall is undependable, monthly observation of water level and atleast 3 monthly observations of quality are needed.
- 5-24 Sec 5.11&12 The write up is very general. For problem soils with part irrigation using saline water, detailed and specific area-soil-crop wise measures, recommendations and control mechanisms are needed.
- 5-25 2 Canal water will be released as per schedule given in Fig.5-1  
Fig. 5-1 shows critical periods of crop water needs and no schedule for irrigation SW or GW. No specific details of command, cropped and irrigated areas are given. Details of the capacity of diggies, the schedule for filling them and irrigation from them vis a vis irrigation frequency, depth and period are missing. The simulation of the operation of the canal to meet the water supply & requirements at diggies and fields is needed. The estimated cost of the system including the pumping component, sprinklers, capital, maintenance, personnel and operating costs and the corresponding benefits are needed for the various crops and crop sequences adopted in different soil areas.
- 6-6 Sec.6.4.4 Water related diseases, the base line estimates, system for monitoring them etc. are to be specifically identified and provided for as part of the monitoring system.

By Speed Post



# नर्मदा नियंत्रण प्राधिकरण

## NARMADA CONTROL AUTHORITY

No.Env-4(4)/2005/ 1391

July 2005-07-28.

✓ To

Shri Lalit Mehra,  
Secretary, Environment Department  
SSO Bhawan, Sachivalaya,  
JAIPUR - 302 005, (Rajasthan)

2/8/2005

Sub : Environmental Management plan for Narmada Command Area.

Ref:

1. Letter No. SE/NCPC/T-23/2005-06/38,1897, 1915 & 2748 dated 3<sup>rd</sup> January, 2005, 27<sup>th</sup> May, 2005, 28<sup>th</sup> May, 2005 & 11<sup>th</sup> July 2005 from SE, Narmada Canal Project, Santhore.
2. Letter No T/F(3)1/NMC/Env/ACE/Jul / 11127 & 154 dated 28<sup>th</sup> Oct. & 16<sup>th</sup> Nov. 2004 from Addl. C.E., Irrigation Zone, Jodhpur.
3. NCP -D-61/III/1114 dated 13<sup>th</sup> Sept. 2004 from Chief Engineer, Irrigation Dept. Rajasthan.
4. Minutes of the 40<sup>th</sup> to 41<sup>st</sup> meetings of the Environment Sub-Group
5. Letter No. Env.3(40)/2004 /382 & 2334 dated 25<sup>th</sup> March, 2004 & 1<sup>st</sup> June, 2004 from NCA.
6. Minutes of the 42<sup>nd</sup> meeting of the Environment Sub-Group forwarded vide letter No. Env-(3)/42/2005/ 2272 dated 18<sup>th</sup> May, 2005.

Sir,

May please refer to the discussions of Environment Sub-Group wherein it was directed that the action plan for implementation of the Environment Safeguard Measures received was not in accordance with the directions given by the Sub-group from time to time and that it required revision. It was further suggested by the Expert Member that the CAD plan, if implemented without revision would lead to large scale water logging & salinity in almost the entire command area. A detailed review of the CAD plan was directed. It was directed by the Chairman of the Sub-Group & Secretary, Ministry of Environment & Forests that Govt. of Rajasthan should resolve the issues through discussions and consultation for the purpose. These are yet awaited.

It is pertinent to mention here that the replies received from Rajasthan vide letters under reference are not adequate. I am enclosing a brief outline of the observations for your ready reference. The issues indicated are required to be looked into greater details for preparation of meaningful management plan for implementation of the Environment Safeguard and achieving the goal of sustainable development.

It is therefore necessary that detailed discussions amongst experts and officers of the NCA and Govt. of Rajasthan are arranged at a mutually convenient venue & time without further delay. Such discussions can also be arranged at Indore wherein authors of the management plan, representative of the implementing agency, concerned officers and decision maker from Rajasthan Govt. are present preferably during second week of August 2005. Alternatively experts and concerned officers of NCA could be invited for detailed discussions on the subject at Jaipur for expeditious completion of the project.

Thanking you.

Yours faithfully,

Encl : As above.

31/8/05  
21/8/05  
23/5/05  
0/0

(DR PAWAN KUMAR)  
Director (Environment)

Copy to :

- 1) The Chief Engineer, Irrigation Department, Sinhai Bhawan, JAIPUR, Rajasthan
- 2) The Superintending Engineer, Narmada Canal Project, Circle I<sup>st</sup>, Santhore, Rajasthan.
- 3) OSD to Secretary Environment, IIIrd Floor, SSO Building, Secretariat, Jaipur, Rajasthan

(DR PAWAN KUMAR)  
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## OBSERVATIONS ON THE COMMUNICATIONS RECEIVED FROM GOVT. OF RAJASTHAN REFERRED TO IN THE LETTER DATED 2<sup>nd</sup> AUGUST 2005.

Regarding Comparison of Features of the CAD Plan of Gujarat vis-a-vis EIA & M Plan of Rajasthan

### General observations

- No EIA reports are available(except on drainage, conjunctive use and water quality aspects carried out by the WAPCOS )
- No methodology for EIA has been used /described in the report
- Environmental issues have not been appropriately addressed in the EIA and Management Plan of Rajasthan.
- Detailed GIS based maps as were made available by the Gujarat (SSP) and Madhya Pradesh (ISP) were not submitted.
- Canal bank plantations are additionally over and above the EIA/EMP, plan . This should have included the extent of area, soil types choice of species, nurseries/ institutional/legal provisions but are missing
- No provisions for budget/ monitoring for EIA/EMP are assigned/ described

In brief the Environment Management plan in its present form is not in accordance with the directions given by the environment Subgroup and therefore cannot be accepted.

### Specific observations

• Division of the chapter of Biological Environment into Flora / Fauna / Mammals / Avi Fauna / Fisheries, itself is erroneous and non scientific. This indicates that no biologists was associated / consulted during preparation of the plan or author is not familiar with biological components. Detailed baseline survey on flora & fauna, fisheries, health etc. was carried out by Govt. of Gujarat with the help of Universities / expert institutions. Recommendations of these study groups have been considered. Reports of these studies are available in NCA and can be referred to for carrying out similar studies for the Rajasthan areas.

1. **FAUNA:** Fauna of the Command seems to have been mistaken for big wildlife (earlier referred to as big game animals). Further the statement that impacts if any will be addressed by the respective State Department in a normal course under various states and national programme is totally misplaced due to following reasons.
  - a. Environment Sub-group has directed that : The activities necessitated on account of Narmada Canal Project should be additional / over and above the normal activities of the line department. As the normal activities of the regular departments of the Govt. of Rajasthan normally do not take into account the special conditions created due to bringing of irrigation in the areas where it was not known previously.
  - b. Baseline data under para 2.5.2 refers only to Wildlife focusing on big animals, commonly described in any text book. Positive impacts described under para 3.9 do not relate with / based on contents of para 2.5.2. Similarly contents of negative impacts on page 19 no way relates to the baseline data. The environment management plan has completely excluded any reference to the faunal aspects.

There is neither any baseline data, nor any method of assessment, described in the management plan. There is no quantification of any impact. The management plan therefore has excluded any reference to fauna aspects of the command. Command area in Rajasthan may also have to deal with swarming of locusts for which special

management plans are required to be incorporated, specially focusing for existing mechanism and incremental measures plan. Baseline data on the same is lacking.

Apparently no detailed survey seems to have been carried out by any agency with the objectives delineated by the Environment Sub-group. The prime objective of such a survey would be to identify any rare or endangered species hither to unknown / already identified and to devise suitable protective / restorative and ameliorative measures. In the absence of detailed survey impacts of irrigation can not be determined / assessed or quantified. Therefore mitigating the negative impacts remains elusive, defeating the purpose of preparation of a management plan.

2. **FLORA :** As in case of fauna, flora also seems to have been mistaken by plantation programme along the canal bank. Description of the forest in command is general description found in any common text book on the desert eco-system and is not specific. Apparently no efforts have been made for surveying flora of the command. The question of identifying / assessing / quantifying / mitigating the impacts remained only in dreams. Plantations along the canal bank is necessary in addition to inclusion of management plan for protection / restoration / amelioration of the flora of the command. Therefore, the statement that provision of 28.8 crores for plantation along the canal system included in the progress can form a part of protecting flora of the command, is contrary to the directions of the Environment Sub-group. What is described in the para 3.9, 4.4 is not based on baseline data and completely superfluous. The statement that no wildlife of the command area in Rajasthan is scheduled in the constitution (rare or endangered) is apparently contrary to the facts. Reserve forests would be provided irrigation water is illogical without any baseline. Why it is necessary, how much it is necessary is purely conjectural and not based on fact. The measures for mitigation suggested in the plan are not referred to in the impacts identification as to why such measures are necessary. There is no baseline data, no survey, no assessment and therefore the report submitted in its present form can not be referred to as environment management plan.

Neither the exhaust literature that is available on flora of the command in Rajasthan has been referred to nor any attempt has been made to identify rare / endangered / valuable flora of the command. The question of assessing the impacts or for that matter including in the managing plan has been elusive and is yet to be taken up, in accordance with the direction of the Environment Sub-group.

The statement that bio drainage would remain at the mercy of the cultivators is misplaced and can not be accepted. Managers have to play proactive role to containing water logging and for providing necessary institutional / legal / financial support to the cultivators. Unless taken up seriously large scale water logging are expected in the command.

- 3. FISHERIES
- 4. SOIL SALINITY
- 5. AGRICULTURE
- 6. PUBLIC HEALTH
- 7. WATER QUALITY
- 8. ETC.,ETC

Observation can be detailed on the lines brought out for the parameters of flora and fauna above



## 14. ACTION PLAN

The action plan envisaged for the fisheries development and habitat conservation in context of NSP and SSP includes both long and short term programmes. The short term plan pertains to the pre-impoundment stage whereas long term plan will be required to tackle comprehensive management of reservoirs and other issues relevant to post-inundation stage. The major programmes pertinent under each category are as follows :

### (A) Action plan for pre-impoundment stage

1. Hydro-biological monitoring with particular reference to thermal stratification phenomenon should be taken up in the reservoirs like Bargi, Tawa, Barna and Kolar, sharing similar geo-climatic regimes. Investigations on the population of anaerobic bacteria may also be included. The studies would enable drawing tangible programmes during the post-impoundment phase of the River Narmada.
2. Fisheries survey of the entire Narmada River basin is required to know precisely, the prevailing status of the important fish taxa comprising the fishery. This should be based on a statistically designed programme covering representative sectors of the basin. Faunistic survey of deep pools existing in the Narmada River has great relevance in delineating their possible role as sanctuaries since these provide congenial habitat to a number of endemic fish taxa particularly during summer season of low discharge. This would enable compiling information on the strategy to be adapted for revival of threatened endemic fish fauna from conservational perspectives. The survey may, however, be taken up by an Inter-State Fisheries Development Board, whose constitution is immediately required.
3. Tree-felling plan should be executed prior to submergence. This would also enable smooth execution of exploitation programme.

4. Identification of suitable sites for development of infrastructures required for execution of artificial propagation programme in respect of threatened fish fauna should commence right now. *River ranching* shall avail a good standing stock of the vulnerable fish taxa to the resulting reservoirs. Efforts should be initiated to develop rehabilitation methodology in respect of threatened fish taxa for which the same is not available.
5. Pollutational hazards should be monitored periodically.

**(B) Action Plan for Post-impoundment stage.**

1. Reservoir fisheries development plan should incorporate an integrated approach. A holistic management programme shall be the ideal and lead to the conservation of endemic biodiversity to the maximum extent possible, which is of much concern in present context. The conservation of catchment area and rational use of agricultural inputs like fertilizers, pesticides should form important part of this integrated approach. Public awareness regarding the judicious use of agricultural inputs should be propagated.
2. Since SSP submergence falls in three States, an "Inter-State Fisheries Development Board" having representation from riparian states should be constituted to manage the reservoir. The board shall regulate all the management exercises, supervise and enforce the conservational measures for optimum sustained yield. The major measures are as follows :
  - (a) Multispecies stocking based on eco-oriented approach should be taken up. Efforts should be made to maintain a viable prey-predator ratio.
  - (b) Stocking norms should be based on the potential of the resource.
  - (c) Exploitation Quota based on M.S.Y. (Maximum Sustainable Yield) will have to be prescribed, for conservation of biota.

- (d) Regulation of mesh size of the gears.
- (e) Observation of 'Closed Season' for allowing possible natural recruitment.
- (f) All negative/deleterious fishing operations like dynamiting, poisoning and over-exploitation should attract prohibition and
- (g) Release of pollutants without treatment directly into the reservoir should be banned.

The above measures have also relevance to other reservoirs coming up in the Narmada basin.

- 3. Hydro-biological monitoring should remain in vogue to scan the changes due to anthropogenic activities.
- 4. An intensive stock augmentation programme will also have to be executed after the completion of dams. This is more important in respect of the threatened fish fauna.
- 5. There is although remote possibility of development of weeds due to high water fluctuations in NSP and SSP but its monitoring is essential since these provide conducive conditions for growth of vectors of a number of diseases.
- 6. Revival of downstream fishery is based on the measures leading to salinity confinement or arrest to the desirable limits. Coastal aquaculture practices involving euryhaline taxa may be taken up as a supplementary measure.

केवल सरकारी प्रयोग के लिए  
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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**तैंतालिसवी बैठक का कार्यवृत्त**  
**Minutes of the 43<sup>rd</sup> Meeting**

27 नवम्बर, 20056 को  
पर्यावरण भवन, नई दिल्ली में हुई  
Held at Paryavaran Bhawan, New Delhi on 27<sup>th</sup> November, 2006

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

इन्दौर  
जनवरी, 2007

**Indore**  
January, 2007

# **MINUTES OF THE 43<sup>rd</sup> MEETING OF ENVIRONMENT SUB-GROUP**

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**MINUTES OF THE 43<sup>rd</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NCA HELD ON 27<sup>th</sup> NOVEMBER, 2006  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

The 43<sup>rd</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held at Paryavaran Bhawan, CGO Complex, New Delhi, under the Chairmanship of Dr. Prodipto Ghosh, Secretary, Ministry of Environment & Forests (MoEF), Govt. of India.

List of participants is enclosed at **Annex-XLIII-Min-(1)**.

The Chairman welcomed all participants to the meeting and discussion on the agenda items was taken up thereafter.

**Item No.XLIII-1(199) : CONFIRMATION OF THE MINUTES OF THE 42<sup>nd</sup> MEETING  
OF THE SUB-GROUP.**

No comment was received from any member. Accordingly minutes of the 42<sup>nd</sup> meeting as circulated vide letter of NCA dated 18<sup>th</sup> May, 2005 were confirmed.



**Item No.XLIII-2(200): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES – PRESENTATION OF THE REPORT OF THE COMMITTEE.**

Director (Environment), NCA informed that in pursuance to the directions of the Sub-Group, field visits were undertaken to the SSP areas in Gujarat, & SSP & ISP areas in Madhya Pradesh and that a visit to the areas in Maharashtra was being organised shortly for which convenience of the members is being obtained. These reports identified certain area where implementation was weak and required strengthening. The key concerns of the committee were presented in the agenda notes as summary recommendations, requiring actions on priority. It was further informed that field visit reports of the committees were sent to all members for their views & observations. Comments were received from Prof. Ramaseshan and Prof. Katti. These were enclosed as annexure to the agenda papers of 43<sup>rd</sup> meeting. Prof. Ramaseshan, based on his observations during field inspection of the Command Area in Gujarat, desired modifications in the report. His observations were forwarded to Govt. of Gujarat for resolving the issues raised by him.

The Chairman stated that, considering that reports of the field visits were sent to all concerned much earlier, State Govts. should submit status of compliance on the recommendations of the committee.

The CMD, SSNNL pointing out that visit of the committee was undertaken last year and since several new developments have taken place thereafter, invited committee members to visit the areas in Gujarat again for noticeable change in the implementation of development works. He assured the Sub-Group that implementation works were making progress in the command area and downstream flows as promised to the Sub-Group were also being maintained. He further stated that felling of coppice growth from the entire area had been completed. He also assured the Sub-Group that recommendations on compensatory plantations were also being attended to by the project authorities.

Member (E&F), NVDA stated that the issues raised by the committee are being attended to and details of the same shall be informed while reviewing the progress under the item on SSP & ISP.

**Item No.XLIII-3(201): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.****A) Action Taken Report on implementation of the environment safeguard measures.**

It was informed that during the last meeting of the Sub-group the Chairman had directed the State Govts. to complete the remaining works in time. Accordingly issues were pursued with the State Govts. and information received is presented to the Sub-group in the form of action taken report (ATR). The Chairman desired that the issues brought out under ATR could be discussed while reviewing the progress under item "B" of the agenda papers.

**B) Current Status of Implementation of the Environmental safeguard measures commensurate with dam height to full reservoir level.****(a) CATCHMENT AREA TREATMENT**

The Director (Env.), NCA stated that as reported by the State Govts and presented to the Sub-group earlier, targets of physical works in the field were nearly achieved. It was however directed by the Chairman during the last meeting that project specific assessment of the areas treated was required and that suitable agencies must be engaged for this work at the earliest. State Govts. representatives reported the progress on this aspect as under.

**Govt. of Gujarat:**

**M.D. SSNNL** informed that the updating of assessment work on Non-forest areas was under progress through field stations established by the Central Soil Research & Training Institute, Dehradun, specially for the purpose. Interim report, received recently, shall be sent to the Narmada Control Authority for circulation to the members. Regarding forest areas, he assured that the work on updating and reassessment shall be entrusted to the identified institute for carrying out periodic assessment on a regular basis & the progress shall be reported soon.

**Govt. of Maharashtra**

Representative of the GOM informed that Forest Survey of India, Nagpur Centre was carrying out sub watershed wise assessment of efficacy of the catchment treatment works in the forest areas. He assured to expedite updating of the report at the earliest.

He further informed that for the agricultural areas, Central Soil Research & Training Institute has established two research stations and interim report is expected soon.

### **Govt. of Madhya Pradesh**

Member (E&F), NVDA stated that NVDA is taking steps for the purpose and progress shall be reported soon.

After some discussions, the Chairman reiterated that the compliance on qualitative assessment in all the States needed to be expedited as already discussed and suggested during the last meeting. He directed that updated report for forest as well as non-forest areas should be submitted before 31<sup>st</sup> March, 2007 & verification of the same through field visits should be continued.

### **(b) COMPENSATORY AFFORESTATION**

The Director (Environment), NCA informed that works on plantations in the forest as well as non forest areas were nearly completed. Transfer of the afforested areas to the regular territorial divisions and declaration of these areas as forest land was making progress. He referred to the recommendations of the report of the committee (constituted by the Environment Sub-group for undertaking field visit to the project areas) on plantations and pointed out that completion report on transfer of plantations areas is awaited from all the states. It was further pointed out that implementation report on the committee's recommendation is yet awaited. Reports on development of neo-ecosystem from the states of MP and Maharashtra were also awaited.

Prof. R.K. Katti pointed out that as about 2/3<sup>rd</sup> of the plantations have been undertaken in the degraded forest, assessment of the canopy cover of the forest raised under compensatory plantation schemes was also required to be carried out in these areas.

It was informed by the representative of the Govt. of Gujarat that assessment of the canopy cover is being carried out through complete enumeration of the growing stock as well as through remote sensing applications. MD SSNNL pointed out that as suggested by the Chairman during the last meeting, the areas where survival rate was poor have been supplemented with casualty replacements, proper maintenance and watch and ward. Details of the works carried out shall be sent soon.

The Chairman requested information on current status of assessment of plantations raised and considering that the report received from the project authorities on survival count / species composition / crop density / crop height etc., required updating, he directed that complete details for assessment of quality & quantity of the plantations raised by the project authorities should be reported to the Sub-Group by the end of March 2007.

**(c) COMMAND AREA DEVELOPMENT**

The Director (Environment), NCA referred to the discussions of the last meeting and drew the attention of the Sub-Group that measures planned for safeguarding the environment were not in place, micro network of distributaries was not ready and that annual targets related to provision of botanical gardens, health facilities on farm and off farm developmental works were small compared to the over all targets. He further pointed out that the activities necessitated on account of bringing irrigation in the areas, where it was not known previously, should have been incremental over and above the normal State plan. He also referred to the recommendations of the committee of the Subgroup in this regard & drew attention of the members to the tabular statement annexed with the agenda papers which showed that information on the most of the parameters was awaited. Prof. R.K. Katti pointed out that designing & implementing the drainage measures was *sin-quan-non* for development of irrigation and was inescapable specially in the conditions prevailing in Gujarat & Rajasthan, where sub soil water is mostly saline. He enumerated the nature of soil deposits in Rajasthan and Gujarat to emphasize the need for proper planning and implementation of the safeguards in time.

The CMD, SSNNL stated that the plan prepared included provisions for drainage & water-logging in addition to various other safeguards but farmers, who are owners of the field, at this juncture do not intend to provide drainage lest they loose the moisture content present in the soil. He referred to the visit of the committee and stated that committee visited the areas where there was good rainfall yet no water-logging was observed by the committee. He further informed that Gujarat was a major exporter of good quality cotton which is sensitive to water logging and no ill effects have been reported yet. He also referred to the monitoring proforma annexed with the agenda papers and stated that this proforma needed modification to exclude certain issues

such as monitoring of the development of the fisheries in the command, which might be outside the purview of the Environment Sub-Group.

In response to a question from the Chairman, it was informed that submission of CAD plan to form a part of environmental assessment was directed by the Planning Commission. However, for the SSP and ISP, as these plans were not in place at the time of clearance, the responsibility of overseeing & implementing the plan was entrusted to the Narmada Control Authority. This was also a part of the order of the clearance issued by the Ministry of Environment & Forests, accordingly, it is imperative for the Sub-group to monitor implementation of the command area development plan. Several studies were directed by the Sub-Group including development of fisheries in the command and the States were asked to update their plans to include recommendations of these studies. The updated plan received from the Gujarat State was circulated to the members for their observations and approval. To monitor the implementation, in accordance with the advice of the MoEF, a proforma which included targets contained in the plan was developed and circulated. Govt of Gujarat was requested to provide updates on the status of implementation of the planned safeguards. It was pointed out that incase Govt of Gujarat proposes a change in the planning itself or there was deviation in the plan submitted, a revised plan is requested. Prof Katti stated that proper mechanism is to be generated / developed for addressing the drainage problem and it can not be neglected only on the basis of what farmers could see at this point of time.

The Joint Director, Botanical Survey of India stated that to reduce the stress on the natural vegetation, the command area development was expected to include schemes for incremental plantations not only on the canal banks but also on all available vacant land, besides agro forestry and establishment of botanical gardens for conservation of flora of the region in accordance with the recommendations. Representative of the Wild Life Institute of India stated that there are several other major issues, such as, movement of wild Ass across Greater & Little Rann of kutch (GRK & LRK), which are required to be addressed professionally.

After some discussions on the subject, the Chairman suggested that it would be desirable to monitor & work for betterment of the command area and opinion of the experts is considered at every stage of development, specially when the area under consideration is large. He, however, suggested that the proforma designed &

developed may be modified to include or exclude the concerns through mutual discussions amongst officers of the MoEF, NCA and SSNNL. He further stated that this should be expedited at the earliest preferably by the end of January 2007 and reported to the subgroup.

### **Command area in Rajasthan**

Representative of the Govt of Rajasthan stated that in pursuance of the last meeting of the subgroup discussions were held with expert members and concerned official of the Narmada Control Authority and response of the Rajasthan on the observation received were forwarded to the Narmada Control Authority, and that Rajasthan was awaiting approval of its plan by the Sub Group.

The Director (Environment), NCA drew the attention of the Sub-Group that the planning and implementation of the environment safeguard measures were not properly included in the plan received from Govt. of Rajasthan though directed by the Sub-Group. The plan submitted by Rajasthan included only recommendations on drainage and conjunctive use aspects made by WAPCOS. There was no EIA report on biological components of the command area. Only a 10 page report containing general features was projected as EIA report. Besides the Environmental Management plan received from Rajasthan was not self contained, referring to the main project report at various places As copies of the main project report were not available, the management plan could also not be scrutinized by the members. The preliminary observations of the expert members raises apprehensions that the plan received from Rajasthan, if implemented, would convert the command area in the Rajasthan to a saline desert, as area under irrigation was increased through use of saline groundwater which in-fact should be unfit for irrigation without provision for leaching. It was proposed to send this report to Soil Salinity Research Institute, Karnal & Central Ground Water Board for their opinion. Govt. of Rajasthan was requested to send 5 additional copies of the DPR at the earliest.

The CMD, SSNNL stated that he is organizing a meeting to discuss the issues related with problematic areas with the experts and officials of the Govt. of Rajasthan during 1<sup>st</sup> Week of December, 2006 as the problems of salinity is common for Phase-II areas in Gujarat with that of Rajasthan. He extended invitation to the Narmada Control Authority officers also to participate in the discussions for benefit of the project.

The Chairman summed up the discussions by saying that a proper EIA report as per concern raised, is called for. He suggested that copies of the report requested should be made available at the earliest and considering that the issues raised by the experts are serious in nature, detailed examination and further discussions to apply closures to the issues raised should be arranged by the end of January, 2007. This was agreed to by the representatives of the Govt. of Rajasthan.

**(d) Flora, Fauna and Carrying Capacity**

The Director (Environment), NCA drew the attention of the Sub-Group towards the fact that safeguarding the terrestrial and aquatic eco system required implementation of the desired plans for declaration of sanctuaries/national parks/conservation and development of fisheries, flora and fauna, migratory corridors etc for the wildlife moving out from the submergence area, before commencement of submergence. However, required actions such as creation of Sanctuaries / Closed areas at Mathawad & Bokrata, though planned, have not been implemented, in Madhya Pradesh though submergence has increased to EL 121.92 m. In Gujarat recommendations of the M.S. University, Baroda regarding protection of flora & fauna have not been implemented. Implementation of the recommendations of the committee of the Environment Sub-Group was also awaited.

**Govt. of Gujarat**

The CMD, SSNNL stated that the implementation of the management plan for development of Shoolpaneshwar sanctuary was making progress. He read out from a report from Wildlife Census indicating that the only tiger observed in the past has not been sighted for a very long time. He assured the Sub-Group that the steps would be taken for implementation of the other suggested measures by the end of June, 2007.

**Govt. of Maharashtra**

The representative of GOM informed that shortfalls on buffer zone plantations have been removed and plantations have been raised as targeted. He assured the Sub-group that the other recommended measures would also be attended to on priority within next three months time.

**Govt. of Madhya Pradesh**

It was pointed out by Director (Environment), NCA that detailed EIA report on the proposed creation of the sanctuary/national park directed by the Sub-Group during in its last meeting was awaited from Madhya Pradesh.

Member (E&F), NVDA informed that an agreement has been reached and Terms of References (TOR) have been signed with the Wildlife Institute of India for carrying out Environmental Impact Assessment (EIA) at the earliest. In response to a questions from the Chairman, Dr. V.B. Mathur, Dean, Faculty Wildlife Institute of India stated that the work would take about three months time after release of required funds and work order. If funds are released by the end of Dec. 06, it would be possible to submit the report after March 2007.

The Chairman summed up the discussions by directing that the necessary work orders & funds should be released by the Govt. of Madhya Pradesh as per their agreed TOR to facilitate early completion of the work. He further desired that all works on felling of trees should also be completed in a planned manner.

**(e) Seismicity & Rim stability**

Govt. of Gujarat was required to update instruments at the observatories located around the periphery of the Sardar Sarovar Reservoir. Progress on these aspects was awaited. Similarly recommendations of the Dam Safety Review Panel required to be put to the Sub-group was also awaited.

The CMD, SSNNL stated that next meeting of the Dam Safety Review Panel is likely to be convened shortly and its recommendations shall be put up to the Sub-group thereafter. He further informed that a completion report on up-dation of the instruments shall be submitted by the end of March 2007.

**(f) Health Aspects**

Member (E&F), NVDA presented a report on completion of buildings for the proposed health facilities on the periphery of the reservoir and stated that for Geographic reconnaissance studies, the work was being carried out by the National Anti Malaria Programme (formally Malaria Research Centre) for the ISP areas and their recommendations would be applicable to SSP areas also. The data on epidemiological and water quality aspects was being collected by the Health Cell of the NVDA.



It was informed by the Director (Env.) that the data collected was required to be synthesized and submitted to the Narmada Control Authority. The water quality parameters being collected by the pollution Control Board were also required to be analysed as it would be useful in assessment of required mitigatory measures. This was urgent to prevent any epidemic in the area, specially in view of the fact that dam height has to be raised to 121.92 m. and beyond, soon.

### **Gujarat**

Director (Env.) NCA, stated that while progress reported for the facilities at the dam site and R&R sites were making progress, the progress on provision of such facilities in the command was awaited.

### **Maharashtra**

The representative of Govt. of Maharashtra stated that epidemiological surveillance studies was making progress and report was expected shortly and it would be submitted by the end of January 2007. Director (Env.), Narmada Control Authority referring to the decision of the last meeting stated that there were discrepancies in the implementation report with that of the plan submitted. The disease surveillance system continued to be weak as only a few diseases were being monitored. Representative of the Health Services, Govt. of Maharashtra regretted for the discrepancies in the reports submitted and assured that he would examine the issues personally and resolve to submit the report as per precise requirement of the Environment Sub-Group by the end of January 2007.

After some discussions on the issues the Chairman directed State Govts. to adhere to the time schedule and expedite needed actions as promised.

### **(g) Archaeology & Anthropology**

The progress presented was noted by the Sub-Group.

### **(h) Downstream Environment**

The Director (Environment), NCA referring to the discussions of the last meeting pointed out that the Govt. of Gujarat have promised for maintaining minimum flows of 600 cusecs towards downstream requirement. Based on the analysis of the data

received, it has been observed that the flow has not been maintained continuously. Further it was agreed to evolve a mechanism to ensure that the water downstream should never fall below the minimum specified and that it was required to be monitored hourly. Compliance report on the recommendations of the H.R. Wallingford regarding management of downstream areas was also awaited.

The Chief Engineer, (Dam Design), SSNNL stated that the situation has improved, after the dam was raised beyond EL 110.62m. Govt. of Gujarat was making efforts for ensuring the assured releases of the water in the downstream. A copy of the letter containing data on downstream flow was presented during the meeting, in support. Regarding management plan for the downstream areas, he stated that several studies have been entrusted to the identified agencies in accordance with the recommendations H.R. Wallingford. Studies related to reservoir regulation were making progress and outcome shall be reported to the Subgroup on availability of the reports. The representative of the SSNNL stated that it was agreed that the terms of references of the Sardar Sarovar Reservoir Regulation Committee would be amplified to include monitoring of downstream releases and that the possibility of installation of sensors etc would be explored later on and as such this has to be ensured by the NCA. It was informed by Conservator of Forest, SSNNL that mangrove plantations were already completed and a report on the same shall be submitted to the Sub-Group. Regarding issues related with ecological studies of Aliabet and Tawara Island, a detailed report was promised.

After some discussions on the issues, the Chairman desired that report submitted by the Govt. of Gujarat may be examined and presented during the next meeting of the ESG. He requested Govt. of Gujarat to expedite implementation of the downstream management plan in time.

**Item No. XLIII-4(202): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES - INDIRA SAGAR PROJECT**

**(a) Catchment Area Treatment**

**and**

**(b) Compensatory Afforestation**

The progress presented on construction works on the project was noted by the Sub-Group. Director (Environment), Narmada Control Authority pointed out that a presentation on fulfillment of the pari-passu requirement for the Indira Sagar Project was awaited. Similarly progress on assessment of the efficacy of CAT and CAF works was also awaited. The chairman directed that these should be expedited

**(c) Command Area Development & Downstream considerations**

During the last meeting, Prof. Ramaseshan offered his help for up-dation of mathematical modeling for the ground water. It was informed by the NVDA representative that they have extended invitation to him for joining as member of the expert committee and his response was awaited.

**(d) Flora, Fauna and Carrying Capacity**

**Terrestrial Environment**

It was informed that safeguarding terrestrial and aquatic eco-system required implementation of the desired plans for declaration of sanctuary/National Parks/Conservation & Development of fisheries/ex-situ conservation of flora & fauna, migratory corridor for wildlife etc. According to the communication received from the WLI, there were problems in these areas and the required plans were not yet in place though dam was already filled to beyond EL 255 m. In the last meeting the Chairman had stated that the issue of extent and quality of the areas requiring declaration of sanctuaries or parks, in terms of the order of clearance was required to be resolved by taking into consideration the views of WLI also on priority for implementation of the recommendations in time. Outcome of this is yet awaited. In the meantime, wild life continue to suffer from the ill effects of submergence

Member (E&F) NVDA informed that though Wildlife Institute in their EIA studies have recommended creation of certain parks and sanctuaries, these could not be implemented, as it required rehabilitation of certain villages.

The representative of the Wildlife Institute of India stated that except for two villages, all were excluded from the sanctuary development plan suggested by the Wildlife Institute of India, however, the apparent problem was in the areas inundated by the waters of the reservoir. These areas though required to be protected for safeguarding the aquatic fauna, NVDA insisted on excluding these area from the purview of consideration. He further stated that these areas even otherwise also falls mostly under the category of reserve forests and needed protection.

### **Aquatic Environment**

The subgroup was informed that NVDA intended to develop fisheries on the fringe areas of the reservoir, which is a part of forest areas. Recognising the difficulties of developing fisheries in the areas marked for development of sanctuaries, Govt of Madhya Pradesh sought permission of the Sub Group firstly for excluding such areas from sanctuary development and secondly permitting fishing in such areas. The issue was discussed during the last meeting, wherein it was directed that permitting fishing in the reserved forest is outside the mandate of the Sub Group and was required to be taken to the concerned department of the Ministry of Environment & Forest. It was also agreed that Sub Group can consider any recommendation on this issue if received from High Level Expert Group on Fisheries Development. It was further suggested by the Sub Group during the last meeting that Govt of M.P. should approach either or both agencies and issue can be discussed by the Sub Group thereafter. The representative of the NVDA stated that the issue of carrying out fishing in the areas on the fringes of the reservoir was required to be resolved.

Director (Env), Narmada Control Authority informed that the issue of formation of a joint body for conservation and development of fisheries, on the basis of concept paper prepared by Prof. Samar Dutta of IIM, Ahmedabad, was under advance stage of discussions by the High Level Expert Group on conservation and development of fisheries in Sardar Sarovar Reservoir. This also incorporates suggestions on developing fisheries on fringe of reservoir, which are legally classified as forest. The last meeting of this Group was held on 24<sup>th</sup> Nov. 2006 and further discussions are planned during January / February, 2007.

After some discussions, the Chairman concluded by saying that there is a need to examine the issue of notifying water bodies as sanctuaries or national parks, even though their legal status remained as reserved forest, from the angle of providing

opportunities for developing fishing, mainly because there are differences in the provisions when the area is forest with that of when area is declared as sanctuary or national park. He suggested Govt of M.P. to hold back declaration of such identified areas as sanctuary until issues related with development of fisheries was resolved. He further directed that undisputed areas should be notified without any further delay.

**(e) Seismicity and Rim stability**

Dr. V.B. Bhatt, Sr. Manager (Env.), NHDC informed that in accordance with the recommendations of the Sub Committee of the Environment Sub Group, steps were being taken to entrust remaining observatories also to the Indian Meteorological Deptt. for further upkeep & use.

After some discussions on the issue, the Chairman directed that proper arrangements should be made for analyzing the collected data by professional identified Institutes through proper terms of references on regular basis, so that, in case, it is observed that progressive filling of the reservoir aggravates the situation, corrective steps can be taken. The CMD, SSNL agreeing with this view suggested that University of Roorkee or IMD can be approached

**(f) Health Aspects**

The Director (Environment), NCA brought out that during the last verification during 2001 by experts, deficiencies were observed in implementation of needed safeguards. However NVDA have submitted a revised action plan but report on implementation was not being received in Narmada Control Authority. Sub Group noted the progress and Govt of M.P. was requested to expedite the implementation in time.

**(g) Archaeology**

It was informed that survey of 167 villages was completed earlier by the ASI but further progress on completion of survey for the remaining villages was awaited. Member (E&F), NVDA assured the Sub Group to examine the issue and report back to the Sub Group.

**(h) Anthropology**

The progress presented was noted and GOMP was requested to expedite submission of the detailed report as brought out in the agenda. Representative of the Anthropological Survey of India stated that as per monumental work carried out by the ASI, it has been established that Narmada Valley Civilisation is very old and is comparable to pigmies of the Sough Africa. Therefore, it was imperative that proper studies should be carried out in the valley before submergence.

After some discussions on the issue, Chairman suggested that Anthropological Survey of India should speed up their work and should complete it before the submergence schedule of the Sardar Sarovar and Indira Sagar Projects.

**(g) Environmental Management of Downstream Areas :**

Sub-group was assured of a presentation by NVDA / NHDC on Management of Downstream Areas during next meeting.

**Item No. XLIII- 5 (203) : SHARING OF THE COST OF THE TREATMENT OF  
FREELY DRAINING CRITICALLY ERODED CATCHMENT  
AREAS.**

The information presented in the Agenda Item was noted and after some discussions on the issue, it was directed by the Chairman that the required meeting of the concerned officials of the States and Centre should be arranged by the Narmada Control Authority preferably by end of January / February, 2007.

**Item No. XLIII- 6 (204) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

**A. SARDAR SAROVAR PROJECT CATCHMENT AREA TREATMENT:**

**1. Phase-I Establishment of Silt Monitoring Stations.**

It was informed that in accordance with the directions of the Sub Group each state was required to undertake dedicated assessment of the efficacy of the Catchment treatment works undertaken by them,

**Govt of Maharashtra –**

Representative of Govt of Maharashtra informed that three stations have started functioning in non forest areas at Bijaripati, Dabin and Radhi Kalam. Preliminary report from the first two stations is expected by Feb 07, whereas report from the third station will be submitted only after June, 2007. The work on establishing silt monitoring station in forest area is under progress under the guidance of WCR and TI Washed – Dist Kaira of Gujarat

**Govt of Gujarat –**

MD, SSNL informed that committee of the Environment Sub Group which visited the Silt Monitoring stations in Gujarat made two types of recommendations related to firstly, with the updating of instruments and technique adopted by the institute in taking measurements, and secondly, with observations related to measures to be undertaken for revisiting the areas for treatment. He stated that recommendations related to first issue has been sent to their headquarter and steps are being taken to implement other recommendations also. He, further, stated that report for the second year has been sent to the Narmada Control Authority recently and report for the year 06-07 shall be sent after its receipt.

Regarding assessment of Canopy cover in the catchment, he assured the Sub Group that regular arrangements would be made for submission of timely report and the results of the recent updating would also be sent to the Narmada Control Authority soon.



### **Govt of Madhya Pradesh –**

Information presented in the Agenda was noted and Govt of M.P. was directed to expedite the work by March, 07.

### **2. Phase-II Submission of Catchment Area Treatment Plans and implementation**

Director (Env), NCA stated that this issue was discussed by the Sub Group in earlier meetings, wherein it was directed that State Govt would complete the treatment works at the earliest and the resources for the same would be obtained from River Valley Projects scheme, National Afforestation & Eco Development Board/Jawahar Rozgar Yogana or similar schemes of Central or State Government. Progress in this regard and the efforts made in this direction are awaited from Govt of M.P and Maharashtra. There was a very little area in Gujarat which has been completed alongwith Phase I.

### **Govt of Maharashtra**

Representative of Govt of Maharashtra informed that there are 66 sub water sheds in Phase II of which work has been completed in 18 watersheds and another 8 sub watersheds the work was under progress. It is proposed to take up works in 9 sub watersheds next year at an estimated cost of Rs. 5.5 crores. However, release of funds for completion of work in 8 sub water sheds is awaited. Further progress would be reported in due course.

### **Govt of Madhya Pradesh**

Member (E&F), NVDA informed that progress on treatment of Phase II area was very slow mainly because of lack of resources and sought the help of Sub Group in this regard.

After some discussions on this issue, the Chairman suggested that the State Govt should take up works in phase-II areas under various schemes, such as, Jawahar Rozgar Yogana or other similar schemes of the Central or State Govts, where there is sufficient scope for obtaining funds for such works. He expressed the opinion that this would not only enable Govt. of Madhya Pradesh / Maharashtra to complete the work, but also to generate employment.

## **B. MONITORING WORKS IN MAHARASHTRA**

1. **Agency for Inter Departmental Coordination for effective implementation of the plans in time and funding of the works on implementation of action plans for mitigation of adverse impacts on environment.**

Director (Env), Narmada Control Authority informed that in pursuance to the recommendations of the Environment Sub-group, a series of steps were taken by the Govt. of Maharashtra and Environmental Cell, for strengthening Inter Departmental Coordination, was formed. It was reported by the Govt of Maharashtra during last meeting that required funds were already released and that the cell would start functioning by 1<sup>st</sup> April, 2005. It was, however, observed that monitoring in Maharashtra continued to be weak. A copy of the notification of the formation of Cell was awaited. A report on the activities of the Cell was also required to be presented to the Sub Group.

Representative of Govt of Maharashtra informed that a separate dedicated Environment monitoring cell has been set up to coordinate and monitor the physical progress of environment safeguard measures for Sardar Sarovar Project. It was stated by him that there is a problem related to sanction of funds from the Planning Deptt. The issue was discussed and it was suggested that the implementation of environment safeguard measures was mandatory in terms of the requirement of environmental clearance given by the MoEF to the Project, and therefore, the requirement of funds cannot be a constraint and indent for the same has to be given to the Irrigation Dept. of Govt of Maharashtra in time, as it would be chargeable to the same source from where funds for survey, studies and implementation are being charged.

After some discussions, it was directed that Govt. of Maharashtra should strengthen Environmental Cell created on the directions of the Environment Sub-Group for effective monitoring of the implementation of the Environmental Safeguard Measures. It was a mandatory requirement and should be expedited at the earliest.

## **C. SARDAR SAROVAR PROJECT : PUBLICATIONS / SEMINARS ENVIRONMENT MANAGEMENT.**

Sub Group noted the information contained in the Agenda and requested State Governments for expediting the same. It was informed by the Director (Env.), NCA that

steps are being taken to organise seminars as directed by the Sub-group during April / May 2007.

The CMD, SSNNL stated that Govt of Gujarat was taking up steps for arranging seminars and required publications within the current financial year on the subject in accordance with the recommendations of the Environment Sub Group. It was assured by him that all concerned States/Organisations shall be invited to participate in the workshops / conferences.

**D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

Director (Environment), NCA informed that updating of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level has been requested from the concerned State Govts.

The meeting ended with vote of thanks to the Chair.

# ANNEXURES

**LIST OF PARTICIPANTS OF THE 43<sup>rd</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 27<sup>th</sup> NOVEMBER, 2006 AT PARYAVARAN BHAWAN, NEW DELHI.**

**Ministry of Environment & Forests**

1. Dr. Prodipto Ghosh, Secretary, MOEF, New Delhi.
2. Dr. S. Bhowmik, Addl. Director, MOEF, New Delhi.

**Narmada Control Authority**

1. Shri A.C. Gupta, Executive Member, NCA, Indore
2. Shri A.D. Bhardwaj, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore
4. Shri Kuntal Roy, Dy. Director (Env.) NCA, Indore.
5. Shri Upendra Singh, Dy. Director (Env.) NCA, Indore.

**Sardar Sarovar Construction Advisory Committee**

1. Shri Janardhana Babu R. Dy. Secretary, SSCAC, Vadodara

**Ministry of Agriculture**

1. Dr. D.K. Pant, Principal Scientist, ICAR, New Delhi.

**Botanical Survey of India**

1. Dr. K.P. Singh, Joint Director, B.S.I., Allahabad

**Wildlife Institute of India**

1. Dr. V.B. Mathur, Dean, Faculty of Wildlife Sciences, Wildlife Institute of India, Dehradun.

**Anthropological Survey of India**

1. Dr. A.R. Sankhyan, Anthropologist, Anthropological Survey of India, Kolkatta-16.

**EXPERT MEMBERS**

1. Prof. R.K Katti Expert Member, New Delhi.
2. Shri B.G. Varghese, Expert Member,

**GOVERNMENT OF GUJARAT**

1. Shri P.K. Laheri, Chairman/M.D., SSNNL, Gandhinagar.
2. Shri Anil B. Mandavia, Director (C), SSNNL.
3. Dr. S.D. Vora, Conservator of Forests, SSNNL, G'Nagar..

**GOVERNMENT OF MADHYA PRADESH**

1. Shri P.C. Shukla, PCCF & Member (E&F), NVDA, Bhopal
2. Shri A.K. Jain, C.F., NVDA, Bhopal.
3. Shri V.B. Bhatt, Sr. Manager (Env.) , NHDC, Bhopal

**GOVERNMENT OF MAHARASHTRA**

1. Dr. B.N. Patil, SC-I, Cum Deputy Secretary (T), Environment Department, Govt. of Maharashtra, Mantralaya, Mumbai.
2. Dr. B.C. Bagh, Jt. Director, Health Services, Govt. of Maharashtra.

**GOVERNMENT OF RAJASTHAN**

1. Shri R.M. Mishra, Addl. Secretary, Dept. of Environment, Govt. of Rajasthan, Jaipur.
2. Shri N.R. Rai, SE, Narmada –II, Sanchoe, Rajasthan.
3. Shri M.C. Jain, Ex. Engineer, Narmada Canal Div.-I, Sanchoe (Raj.).



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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**चवालीसवीं बैठक की कार्यसूची**  
**Agenda for the 44<sup>th</sup> meeting**

स्थान : पर्यावरण भवन, नई दिल्ली  
Venue : Paryavaran Bhawan, New Delhi

दिनांक : 16 जुलाई 2007 10.30 बजे पूर्वाह्न  
Date : 16<sup>th</sup> July, 2007, 10.30 A.M.

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**जुलाई, 2007**  
**Indore**  
**July, 2007**

**AGENDA FOR THE 44<sup>th</sup> MEETING  
OF ENVIRONMENT SUB-GROUP  
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**AGENDA FOR THE 44<sup>th</sup> MEETING  
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**Item No. XLIV-1(2005) : CONFIRMATION OF MINUTES OF THE 43<sup>rd</sup> MEETING OF  
THE ENVIRONMENT SUB-GROUP.**

Minutes of 43<sup>rd</sup> Meeting of Environment Sub-Group of Narmada Control Authority held on 27<sup>th</sup> November, 2007 were circulated to all Members and Invitees vide Narmada Control Authority office letter No. Env-3(43)/2007/550-587 dated 9<sup>th</sup> February, 2007.

No comment has been received. Minutes are put up for confirmation.

**Item No.XLIV-2(206): REVIEW OF IMPLEMENTATION OF THE RECOMMENDATIONS OF THE COMMITTEE OF ENVIRONMENT SUB-GROUP TOWARDS ENVIRONMENT SAFEGUARD MEASURES OF SARDAR SAROVAR PROJECT:**

During 43<sup>rd</sup> meeting held on 27<sup>th</sup> November, 2006 the Sub-group reviewed the preparedness of the project authorities towards implementation of the required environmental safeguards. State Govts were directed to submit compliance on the recommendations of the committee which carried out field inspection. The status of compliance as available in the office of NCA as on 30<sup>th</sup> June, 2007 is presented in the table below :

**Sardar Sarovar Project : Govt. of Gujarat**

S.N o.	Issues	Recommendations	Current Status
1.	Command Development works(protective and restorative). <b>Urgent</b>	Implementation of all identified Environment Safeguard measures is required <u>pari-passu</u> with the development of command area for which Government has to take immediate actions.	Macro plan received for 4100 ha area . Irrigation already commenced over 2.5 Lac Ha area.-, for which even plan was awaited: Infringement of the clearance order
2.	Downstream management plan <b>Urgent</b>	To be prepared and implemented at the earliest without further delay.	Action plan yet not ready
3.	Downstream flows <b>Immediate</b>	Minimum quality of water required for protection of d/s environment is mandatory and has to be ensured.	Steps are being taken to streamline measures for monitoring
4.	Flora and Fauna: Conservation of rare species / variants <b>Urgent</b>	Part area of sanctuaries should be developed as a garden for multiplication of identified rare species, local areas along the canal to be developed to conserve local herbs, shrubs tree species.	Awaited
5.	Felling of trees <b>Urgent</b>	To be taken up/ completed in planned manner commensurate with progressive filling of the reservoir.	Detailed report awaited
6.	Ex-situ & in-situ biodiversity conservation in the command. <b>Urgent</b>	To be taken up before commencement of irrigation.	Awaited
7.	Health <b>Urgent</b>	Considering reported rise in diseases and consequent high risk qualified experts may be involved in preventing recurrence of various diseases.	Detailed report awaited
8.	Efficacy of Catchment area treatment works. <b>Long term</b>	Study to continue at least for a three years period	Awaited

9.	Compensatory plantation Long term	1. There is a need to prepare a list of successful species and to keep the germ-plasm ready for plantations to be taken up in future in the same areas.	Awaited
		2. There is a need to provide for replacement of casualties due to death decay or wilting and to provide support for artificial propagation of the species planted up. If necessary, help from organisation like Arid Zone Research Institute of Central / State Govts. may be obtained.	Detailed report awaited
		3. There is a need to establish seed orchards / clonal orchards for providing support for the activities suggested in para one.	Awaited
		4. There is a need to consider culture of Rhizobium for development of root nodules.	Awaited
		5. There is a need to keep in check infestation of termite through Silvi cultural / chemical control.	Report awaited
		6. In future sufficient number of fruit and fodder trees may be planted up for supporting wildlife in the area of sanctuary.	Ongoing process.
		7. These areas may also be utilised for raising palatable grasses to be as valuable source for protection of these plantations.	Report awaited.

		8. Financial support for keeping planted area in good condition in terms of watch & ward, replacement of casualties and research & development work for promoting natural / artificial regeneration of the identified species.	Report awaited.
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#### **Sardar Sarovar Project in Madhya Pradesh**

<b>Parameters</b>	<b>Recommendations</b>	<b>Status</b>
Flora Fauna & Carrying Capacity (Terrestrial Eco-system)	EIA studies should be expedited and recommendation implemented before submergence. Impacts have commenced but safeguards measures are not in place.	Field studies commenced report is expected shortly.
Aquatic Eco-system	Up-dating of plan and implementation should be high priority. Impacts have commenced but safeguards measures are not in place.	Not yet started. Up-dation of plan needed.
Health Aspects	Implementation of the action plan on ground should have been completed and disease monitoring required on long term basis.	Report awaited.
Felling of trees	Coppice crop of the forest felled earlier required removal on priority.	Completed, detailed report awaited.
Quality of CAT works	Silt monitoring is to be started as early as possible.	Not yet started
Catchment Area Treatment (Physical)	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.	Awaited.
Compensatory Plantation Physical targets	To revisit the areas for maintenance & casualty replacement.	Awaited.
Quality of CAF works	Crop Diameter and Crop height required to be assessed by complete enumeration through identified agencies.	Not yet started
Seismicity & Rim Stability	Recommendations of the dam Safety review panel should be put up to the Sub Group from time to time IMD may be requested to provide V-Set communication facilities for all observatories.	Report awaited.

#### **Sardar Sarovar Project in Maharashtra:**

Visit to the areas in Maharashtra	Awaited.	Visit is planned during August 2007.
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State Govts. are requested to present latest position on the status of compliance for a review by the members.

**Item No. XLIV-3(207):REVIEW OF IMPLEMENTATION OF THE ENVIRONMENT SAFEGUARD MEASURES OF SARDAR SAROVAR PROJECT: COMMENSURATE WITH PROGRESSIVE FILLING OF THE RESERVOIR**

A review of the present status of Survey, planning, implementation of the Environment Safeguard Measures commensurate with progressive filling of the reservoir at dam height of EL 121.92 m and with respect to full reservoir level is presented below.

**Current Status of Implementation of the Environmental safeguard measures commensurate with dam height to full reservoir level.**

To facilitate a review of the compliance of the directions given by the Sub-group, for considering raise in the dam height, status of the implementation of the environment safeguard measures is presented below.

**(a) CATCHMENT AREA TREATMENT**

Out of total Catchment of 24,45,163 ha, 28.4% was found critically degraded. Of the total catchment 6.66% was treated under phase-I and balance area is proposed to be treated under Phase-II.

❖ **Phase-I.**

- i) Project authorities were required to prepare plans for treating those critically degraded sub-watersheds which were identified as directly draining into the reservoir. The implementation of the plan was to be pari-passu with the construction of the dam.
- ii) To assess the success or failure of the CAT measures implemented for ensuring that structures were maintained and remained functional. Sub-Group suggested use of aerial photography / Remote sensing for assessment of the success rate of CAT works in forest areas besides establishment of silt monitoring stations for the non forest areas. Progress on assessment work is presented in the table below:

S.No.	States	Forest cover assessment	Silt monitoring
1.	Govt. of M.P.	Awaited	Awaited
2.	Govt. of Gujarat	Report awaited.	Report awaited.
3.	Govt. of Maharashtra	Report received revealed decrease in forest cover.	Two established, stations report awaited.

❖ **Phase-II**

The balance sub-watersheds were to be treated under programme for implementation in a time frame to be determined separately by the project authorities in consultation with the Ministry of Environment & Forests.

**Govt. of Gujarat :** The Phase-II area in Gujarat was less and therefore Govt. of Gujarat treated this area under Phase-I itself. Treatment works were already completed.

**Govt. of Maharashtra :** The gross area for which plans are required to be submitted for Phase-II programme is 77568 ha, the progress reported was 14904 ha.

**Forest Area :** An area of 7218.96 ha of forest area was treated during the last 10 years.

**Non Forest Area:** Agricultural areas in 5 sub-watersheds were treated at an estimated cost of Rs.9.86 crores and for treating the balance area Rs.5.02 crores are required for the agricultural department of which Rs.3.26 crores during 2005-06 and Rs.1.76 crores during 2006-07.

**Govt. of Madhya Pradesh:** The gross area for which plans are required to be submitted for Phase-II programme is 3,18,118 ha, the progress reported was 35,312 ha. However, Govt. of M.P. have expressed inability in treating these areas commensurate with progressive filling of the reservoir due to lack of funds and manpower.

Further progress if any may please be presented by the party states for a review by the members. .

**Item No. XLIV-3(207) (b) COMPENSATORY PLANTATION :****QUANTITATIVE.**

- o It was informed by the Party States that the physical works on the available areas were completed.

<b>States</b>	<b>Physical : Achievement (ha.)</b>
Madhya Pradesh	8,737
Maharashtra	19,378
Gujarat	13,950
<b>Total:</b>	<b>42,065</b>

**QUALITATIVE**

In terms of the order of clearance, the non forest areas planted up by the project authorities are required to be handed over to the regular territorial forest divisions for regular upkeep & maintenance and till such time these were to be handed over to the regular department plantations were required to be maintained with watch & ward as per the planned programme. Besides, survival count, species composition, year of count and the areas under each category was required. The progress is presented below:

<b>States</b>	<b>Progress.</b>
Madhya Pradesh	80% non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage and crop composition awaited..
Maharashtra	About 80% of non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage was reported to be 48% and crop composition is awaited. .
Gujarat	96% non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage and crop composition awaited..

Members may like to discuss & review.



**Item No. XLIV-3(207): (c) COMMAND AREA DEVELOPMENT**

The command area of the project has been fixed on the basis of areas included by NWDT for purposes of considering requirement of Narmada water for irrigation. Stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India required series of actions to be taken on the field before commencement of irrigation. Key requirement is indicated in the Annex – XLIV- ( 2 ).

**GOVT OF GUJARAT**

During 41<sup>st</sup> meeting of the Environment Sub-group it was assured by the Govt. of Gujarat that Micro-plan for about 44000 ha area proposed to be irrigated during Phase-I shall be submitted soon and that all required environmental safeguard would be implemented before commencement of the irrigation. Compliance on the observations of the committee, visited the command area in Gujarat as already discussed above, is awaited.

1. A copy of the micro-plan for development for CCA of 41,305 ha under Phase-I of the command was received during last week of December 2005. It was reported by the Govt. of Gujarat that an area of 2.5 lacs ha. was already brought under irrigation. The Environmental Management Plan for 2.5 lacs ha. area brought under irrigation is yet awaited. During the last meeting, Govt. of Gujarat desired change in the proforma designed for monitoring. In pursuance discussions were held and it emerged that change in the proforma could be considered after submission of the plan. GoG promised to submit the plan by the end of March 2007. This is yet awaited.
2. In Gujarat the GCA of the project is 3.43 million hectares of which Cultivable command is estimated to be 2.12 million hectares and annual irrigation is proposed in an area of 1.792 million ha. In order to achieve increase in efficiency of irrigation with the limited quantity of water without impacting the environment adversely, the Govt of Gujarat planned to introduce several measures. However stipulated action as per the CAD plan on formation of the farmers' co-operatives, volumetric water release to them, rotational water distribution, canal automation, conjunctive use etc are not yet operational as brought out in the table placed at Annex-XLIV-(3).
3. In addition Gujarat also planned to provide drinking water to Saurashtra and Kachchh regions through a separate drinking water project. Detailed project report and mitigatory measures planned on this project during the normal year and drought year are awaited.
4. Progress on scheduling, budget towards implementation of the Safeguard measures to contain identified negative consequences of the irrigation commensurate with proposed / practised irrigation, even in the Phase-I areas is awaited. The measures proposed in the CAD plan as outlined in the Annex – LXIII (3) have not yet been fully implemented.

In view of the above, plan needs revision for incorporating environment safeguard measures commensurate with progressive irrigation in adequate manner.

Members may like to discuss & review.

**Govt. of Rajasthan**

In Rajasthan for 2.3 million ha of GCA, Command Area Development Plan was required to be prepared and implemented commensurate with the development of irrigation in the command area. Command area Macro plan for the areas in Rajasthan was received and discussed during the 43<sup>rd</sup> meeting. It was directed by the Sub-Group that the issue raised should be resolved as it emerged from the discussions that the plans submitted by the Govt. of Rajasthan if implemented without extensive revision it would convert the command area in Rajasthan to a saline desert besides impacting environment adversely. In pursuance a meeting to discuss Management Plan for Command Area Development Works of Narmada Canal Areas in Rajasthan, was held at 11.00 A.M. on 16<sup>th</sup> March, 2007 amongst the officials/ experts of Central and State government from Narmada Control Authority, State Govt of Rajasthan and Central Arid Zone Research Institute and it was agreed as under :

- ♦ Govt. of Rajasthan to prepare & present a micro-plan for the areas proposed to be brought under irrigation. utilizing the expertise with CAZRI, considering the status of construction of the canal network. This plan shall be put up for consideration of the Sub-Group in advance of commencing irrigation in the area.
- ♦ A suitable agency preferably Wildlife Life Institute of India would be engaged for preparing an EIA report on Biological resources of the Command Area. Recommendations would be incorporated in the Environmental Management Plan. A meeting has been arranged to finalized TOR for the work to be assigned to WLI, Dehradun
- ♦ A field visit shall be arranged during August, 2007 to the areas in Rajasthan, where irrigation is likely to commence soon.

Further progress may please be informed by the Govt. of Rajasthan.

Members may like to discuss & review.

# Item No. XLIV-3(207): (d) FLORA, FAUNA & CARRYING CAPACITY

The guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora and fauna present can be assessed, listed (rare and endangered) species can be detected, if present, and appropriate conservation measures devised before commencement of the submergence.

Implementation of the recommendations contained in the EIA studies carried out by the agencies engaged by the Gujarat, Maharashtra & Madhya Pradesh were required to be implemented in time.

## Govt. of Maharashtra :

EIA reports indicated presence of rare, endangered and threatened species of wildlife calling special measures for their conservation. State Govts. proposed amongst others two critical restorative measures as brought out below :

1. Buffer zone plantations for rehabilitation of wildlife moving out from the submergence area.
2. Management of corridors for shifting of wildlife, several corridors, passing through moderate to good (0>3) vegetation cover.
3. Studies on development of neo ecosystem

These measures were required to be taken before commencement of submergence in terms of the order of clearance and direction of the Sub-group. As reported by Govt. of Maharashtra buffer zone plantations are making satisfactory progress where as progress on other recommendations on the studies group are awaited.

Members may like to reviewed.

## Govt. of Gujarat :

M.S. University, Vadodara conducted EIA & recommended several measures for preparation of Environmental Management plan for the upstream environment. Key recommendations focused amongst others on the following issues.

- Rehabilitation plan for the identified animals and plants.
- Recommendations of the M.S. University, focusing on activities of the joint forest management committees and specific recommendations for the protection and conservation of *Butea monosperma* (yellow variant) and *Radermachera xylocarpa* which were unique and represented important and rare floral element
- To undertake development programme in rural areas in natural watershed unit.
- Training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state.
- An independent monitoring and evaluating infrastructure for successful execution of these strategies and action plans.
- Govt. of Gujarat reported progress on development of Shoolpaneshwar Wildlife Sanctuary. A detailed report on development works under implementation in the Sanctuary areas and on migration of wild animals during progressive filling of the reservoir is awaited.

Further progress on other recommendations of the EIA study group is awaited. Compliance of the recommendations of the ESG Committee is awaited.

Members may like to discuss and review

#### **Govt. of Madhya Pradesh :**

State Forest Research Institute, Jabalpur carried out the EIA for the areas in Madhya Pradesh and recommended measures for drawing up of the environmental management plan.

State Govt. however proposed restorative and ameliorative safeguard measures as brought out below :

1. To cater to increase requirement of timber, fuel-wood etc., social forestry programme at an estimated cost of Rs.5.0945 crores chargeable to SSP (price level of 1999-2000) with escalation of 9% pre annum was approved by the State Wildlife Committee.
2. 60 islands which will be formed in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.
3. Studies recommended creation of two wildlife sanctuaries namely Mathwad (34.659 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district. In pursuance to the directions in the Environment Sub-group GoMP entrusted EIA studies to the Wildlife Life Institute of India. Studies have commenced and report is likely to be available shortly. Issue of cost sharing for the proposed sanctuaries brought up by the Govt. of Madhya Pradesh could be discussed thereafter.

Members may like to discuss and review.

#### **Aquatic Environment :**

Impoundment in SSP commenced with the closure of construction sluices during Feb 1994. The impoundment has progressed with the attainment of height of E.L. 121.92 m. resulting in much larger water spread, requiring a number of sequential actions, in accordance with pre & post impoundment action plan suggested by the CICFRI to safeguard the aquatic environment. State Govt's are requested to present the steps taken to safeguard the aquatic environment.

#### **Felling of the Trees in the submergence area**

Plans for felling of trees in the forest area coming under submergence to avoid the possibility of animals being trapped in the submergence area, prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc. were required for the areas in Gujarat, Maharashtra & Madhya Pradesh. Forest areas were required to be taken up for felling in a systematic manner to avoid any possibility of the same.

#### **Madhya Pradesh**

Felling in entire forest area coming under submergence is reported to have been completed. Detailed report is awaited.

### **Govt. of Gujarat**

In Gujarat the forest area diverted was 4165.91 ha in addition 356.78 ha was diverted earlier. Thus in all 4522.69 ha was utilized for the SSP. Of this 4152.68 ha of the Distt. Vadodara and Bharuch required felling. The felling in Gujarat was reported to be completed about a decade ago. However pole crop has come up again and required felling. It was observed by the Committee of the ESG that corresponding to 121.92 E.L. about 30% of the area only could be felled and balance 70% felling is awaited. It was reported by Govt. of Gujarat during 43<sup>rd</sup> meeting of the Environment Sub-group that entire coppice crop was also removed. Detailed report is awaited.

### **Govt. of Maharashtra**

In Maharashtra the forest area of 6,488 ha was diverted for submergence out of which 3,157. 03 ha was forest. The balance area was under river bed, nallah etc It was reported by Govt. of Maharashtra that felling operations were completed. A detailed report was awaited.

Members may like to discuss and review.

### Item No. XLIV-3(207): (e) SEISMICITY AND RIM STABILITY

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. Dam design in India is regulated by a national standard developed by the Bureau of Indian Standards (BIS). The BIS has classified the Indian sub-continent into 5 zones depending on tectonic, geologic and seismic consideration using available data. The River Narmada lies in the seismo-tectonic provinces of Cambay Basin and Peninsular Shield (including the Deccan Trap) and comes under Zone 3 of the BIS classification.

**Rim stability** refers to the competency of reservoir base rocks to maintain natural slopes and to contain the stored water. Under stable conditions, there should be no significant losses of reservoir water due to ground water percolation or seepage. Where rocks are found to be highly permeable, mitigative measures are needed to ensure the longevity of the reservoir.

The GOG appointed a Dam Review Panel, comprising engineers and geologists, to evaluate the report and findings and a revised final report was submitted to the project authorities in 1982. The main mitigation measures suggested were as follows :

- Construction of dams and Infrastructure (Incorporating seismic design coefficients) to withstand the maximum credible earthquake
- Establishment of seismic monitoring stations at key locations around the reservoir

Status of Implementation of the mitigatory measures is summarised in the table below:-

ACTION	STATUS
Dam design modifications : <ul style="list-style-type: none"> <li>▪ Adoption of horizontal design coefficient of 0.125g on the recommendation of the Dam Review Panel</li> <li>▪ Installation of stress monitors in the main body of the dam</li> </ul>	Completed
▪ GSI (Nagpur Division) Rim Stability studies	Completed
▪ Tracer Studies by CWPRS	Completed
▪ Monitoring stations	Rim stability studies have been completed and well equipped 9 monitoring stations along the periphery of the reservoir, 4 each on either side and one at the downstream of the Sardar Sarovar reservoir. Out of a total of 9 stations, 3 are in M.P. (Alirajpur, Kukshi and Badwani, 1 in Maharashtra (Shahada) and 5 in Gujarat (Kawant, Naswadi, Kevadia, Jitgaon )
▪ Results of analysis of data from monitoring stations.	Received, analysed by the dam safety review panel of the SSP during October, 2001. Up-dation of the data is awaited.

Regarding up-gradation of network, the technical specifications were being worked out in consultation with IMD. The up-gradation was likely to cost about Rs.5.50 crores. GoG had planned to invite tenders by August, 2004 for the same work. The work was to be completed by September, 2005. Progress from Gujarat is yet awaited.

It was reported during 40<sup>th</sup> meeting that Seismic activity at the dam site and around the periphery was being studied by a team of experts. The data was being analysed and annual seismological bulletins were being published. GoG had requested the Director General, Indian Seismological Research Institute (ISRI), for the evaluation of the Seismic data obtained by the SSNNL.

Further progress may please be reported by the GoG for a review by the members .

**Item No. XLIV-3(207): (f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, a specific requirement for the SSP contained in the environment clearance order of GOI was that the plans for the provision of health facilities to workers and residents of the affected areas should be prepared. Each State should take necessary measures to minimise the risk of malaria, filarial, schistosomiasis and other diseases associated with water that may result from implementation of the project. Preparation of an Action Plan for the surveillance and control of malaria was also stipulated.

As per the further directions received from the MoEF in 1987, the states were required to take up measures given in the following table.

Sl. No.	Mitigation measures	Gujarat	Maharashtra	Madhya Pradesh
1.	Present status of the waterborne disease in the areas	Pre-impoundment data is available.		
2.	Screening arrangements for workers at the project site proposed for the work force;	Completed	Not relevant	Not relevant
3.	Epidemiological Surveillance studies	Completed by SCHMS	Report on disease pattern of Nandurbar District received, but not as per requirement.	Completed by GMC, Bhopal.
4.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases	Action plan under implementation	Revised Action plan awaited	Action plan revised on Aug. 2003
5.	Reinforcement proposed to the existing health delivery system commensurate with progress of construction work.	Completed	Incomplete	Incomplete
6.	Surveillance of diseases	Progressing	Continued to be weak.	Surveillance is weak. Reports not received.
7.	Standard formats available with the NICD to be used for diseases surveillance purpose.	Awaited	Awaited	Awaited
8.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	Progressing	Awaited, two water quality labs working, four being operationalised. Pada Workers are appointed to perform house to house disinfections with the help of Mediclors.	Awaited
9.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.	Progressing	Awaited	Awaited
10.	Regular Entomological monitoring is suggested for alterations in ecology of the area due to irrigation / impoundment.	Progressing with the help of ICMR.	Awaited,	Awaited
11.	It is suggested that sanitary latrines be	Progressing	Awaited	Awaited



	established at the R&R sites and Villagers may be educated to use these to keep the cases of Gastro diseases in check.		Health Department is performing IEC activities to educate the people.	
12	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited	Awaited	Awaited

The status of compliance of requirement may be discussed and reviewed by the Sub-group.

**Item No. XLIV-3(207): (g) ARCHAEOLOGY & ANTHROPOLOGY**

In addition to the general obligation of the States under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF the action plan was to cover the issues on archaeology and anthropology as brought out below.

- 1) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- 2) Plan for rehabilitation of monuments wherever necessary.

The current status of the protection / relocation works is presented below :

		Gujarat	Maharashtra	Madhya Pradesh
Monuments	FRL	2 ( 2 completed)	Nil	Completed
	Commensurate with EL 121.92 m			NVDA assured that no approach shall be impacted
Mounds	FRL	Nil	Nil	Completed
	Commensurate with EL 121.92 m			NVDA assured that not likely to be impacted
Museums/ Park	FRL	N.A.	N.A.	4 ( 1 completed)
	Commensurate with EL 121.92 m	N.A.	N.A.	Not relevant

Further progress may be informed to the Sub-group.

**Item No. XLIV-3(207): (h) ENVIRONMENT MANAGEMENT OF DOWN STREAM AREAS**

Govt. of Gujarat accepted recommendations of HR Wallingford & informed to Sub-group to implement the measures suggested therein. The key mitigatory measures suggested are presented below :

- ▶ Provisions for complimentary flows for mitigating pollutions in the downstream, restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone,
- ▶ Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality including physical, chemical and biological parameters,
- ▶ Developing of mathematical modelling for prediction of likely impacts of different operational scenarios for mitigation, studies on ecology and resources for the downstream environment, narrowing of river channel,
- ▶ Legal agreement between the Party States for regulated releases to ensure that project works as planned.
- ▶ In addition he also mentioned that releases downstream may also have to be diluted for keeping the surface as well as ground water in good condition.

Progress on preparation of the Environmental Management Plan for Management of Downstream areas with time frame budget and implementation schedule is awaited.

Members may like to review.

**Item No. XLIV-4(208): REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES INDIRA SAGAR PROJECT :**

**A. INDIRA SAGAR DAM: SUBMERGENCE (PROGRESIVE) AT EL 262.00 M.**

Indira Sagar Project (ISP) formerly known as Narmada Sagar Project has an installed capacity of 1000 MW and annual irrigation of 1.69 lacs ha. The project is very crucial due to requirement of regulated releases of 8.12 MAF of water from this project for SSP.

After getting necessary clearances the construction works were started in May, 1992 and the dam was targeted to be completed by June, 2000. However, due to various reasons the progress lagged behind. Subsequently, the work was handed over to Narmada Hydroelectric Development Corp. (NHDC), a Joint Venture of Govt., of Madhya Pradesh and National Hydroelectric Power Corporation. As per the available information the constructions works were completed and project is schedule for commissioning. Accordingly the ISP is due to submerge an area of 91,000 ha. this would impact land, Flora and fauna etc.

It was directed by the Chairman during 42<sup>nd</sup> meeting that a presentation on fulfillment of the pari-passu requirement for the Indira Sagar Project should be made. This is awaited.

Progress may please be presented by the NVDA / NHDC on current status of construction of ISP and presentation on fulfillment of the pari-passu requirement, in terms of the clearances given by the Central Govt.

**Item No. XLIV-4(208): (B) CURRENT STATUS OF IMPLEMENTATION OF THE ENVIRONMENTAL SAFEGUARD MEASURES COMMENSURATE WITH DAM HEIGHT OF FULL RESERVOIR LEVEL.**

**(a) CATCHMENT AREA TREATMENT (in ha)**

- As per stipulations, considering the construction schedule, works in the entire Phase-I area is required to be completed before impoundment. The progress achieved upto March, 2007 is depicted below.
- As per stipulations, schemes for treating the Phase-II area are required to be prepared & submitted to the funding agencies like RVP/ NAED Board of MOEF/Various other ongoing schemes of the central/ State Govts. The progress achieved is about 2.26% as depicted below.

**PHYSICAL ACHIEVEMENTS (Area in Ha.)**

		Area in ha.	Treated by NVDA	Covered under Comp Plantation / other schemes	Total area treated up	Balance Area proposed to be treated by State Forest Deptt /NVDA
<b>PHASE-I</b>	Non-forest	49837*	49598	00	49598	239
	Forestland	11515**	4273	4587	8860	1833
	Total	62,975	53871	4587	58458	2072
<b>Phase-II</b>	Non forest	806720	20734	00	20734	
	Forestland	108430				
	Total	915150	20734			894416

\* Revised targets as per micro planning( including unworkable area of 2090 ha)  
Earlier targets were 51,927 ha

\*\* Revised targets as per micro planning (including unworkable area of 822 ha)  
Earlier targets were 11,048 ha

During the last meeting it was informed by the NVDA that progress is behind schedule due to non availability of the required funds of the order of Rs. 645.59 crores

**Quality Assessment**

**Forest & non forest areas:** It was directed by the Sub-Group that dedicated focused monitoring of the executed CAT work was essential for assessment of the efficacy of CAT and CAF works. The progress is yet awaited.

Members may like to discuss & review.

(b) **COMPENSATORY PLANTATION : Planning and progress**

Ministry of Environment and Forest vide letter No. 8-646-84-FC Dated the 7<sup>th</sup> Oct. 1987 permitted diversion of 41,111.97 hectares of forest land in Khandwa, Dewas and Hoshangabad districts for the Narmada Sagar Multipurpose Project. under Section 2 of the Forest (Conservation), Act, 1980, subject to the following key conditions that :

1. Compensatory plantation will be carried out over suitable degraded forest land double the diverted forest area in extent and in addition to the equivalent area in non-forest land. However subsequently the scheme for compensatory plantation submitted vide letter Nos. F.D /AAA/ AO/3 dated 13.11.1987, as detailed below was approved by the MOEF . However additional compensatory plantation over 150 ha. degraded forest was directed.
2. The areas will be surveyed, demarcated and declared protected forests and placed under the control of the Forest Department for compensatory plantation at the cost of the project. Areas not found suitable will be substituted by suitable area.
3. Forest clearance was to be done only upto 4 M below FRL.

District	Area in hectares diverted for ISP	CA target in Degraded Forest	CA target in non forest area	Total target in ha.
Khandwa	33,383	30,572	2,314	32886
Dewas	4,528	17,491	802	18293
Hoshangabad	3,678	22,739	2,842	25581
Sehore		-	1,247	1,247
Dhar		-	1,001	1,001
Khargone		-	1,937	1,937
Total	41,589	70,802	10,143	80,945
Revised Targets		70,952*	10,452**	

\* Targets revised due to additional works over 150 ha area as penalty.

\*\* Targets revised due to release of additional 308.47 ha of land.

**Progress of implementation**

The progress reported by GoMP by the end of March 2007 was 78,643 ha (forest area = 68,596 & Non forest area = 10,047 ha). However after deleting the targets covered under CAT programmes balance target works out as 6,943 ha. As per stipulations these areas were required to be planted up by Monsoon of 2006.

Progress on Assessment of the success of plantations giving survival percentage, year of count with species wise details alongwith progress on declaring plantation areas on revenue land as forest land under Forest Act of 1927 may please be presented, for a review by the members.

### (c) COMMAND AREA DEVELOPMENT

The project on completion will provide annual irrigation to 1.69 lakh ha. The Command area comprises Forest: 10,055 ha; Grasses and pastures: 10,498ha; Cultivated land: 142,406ha; Culturable fallow : 8,116 ha; Barren:18,385 ha. As per direction of the Planning Commission, project proposals are required to include the command area development plan also. MoEF clearance of 1987 also required it. The forest clearance stipulated that tree planting should also be done on either side of canal road and foreshore of the reservoir and in the wasteland / vacant lands under the control of the Irrigation Department in the command area. The key conditions attached with the investment clearance were as follows.

- o The State shall comply with the conditions as laid down in the O.M.No.3-87/80-IA dated 24.6.1987 and letter No.8/646/84-FC dated 7.10.1987 both issued by the Ministry of Environment and Forest while according the environmental clearance and the approval for diversion of forest lands for this project respectively for this project and ensure completion of Rehabilitation and Resettlement Plan in scheduled time with close monitoring as per requirements of Department of Environment and Forest.
- o State will establish adequate network for ground water monitoring in the command within 2 years and the State should submit to Planning Commission the time frame for establishing such network with mile-stone achievements, duly vetted through Central Water Commission, for monitoring the same by Planning Commission
- o State should draw up a detailed time schedule for completion within 5 years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area ( which is not already submitted to the Planning Commission at the time of seeking approval ) of the total command of this project.
- o The State should draw up an implementation schedule segment-wise for completion of canal network, in such a manner that a segment of the canal network, taken up from head reaches, is completed in all respect so as to make the irrigation water available, for the design potential of that segment upto the outlet in that particular segment;

#### **Progress of Implementation :**

The study on impact of Agro chemicals, runoff from fields on surface & ground water quality in the command area was assigned to J.L. Agricultural University, Jabalpur. Results may please be presented

As informed during by the NVDA a GIS based CAD plan was under preparation with the help of NIC, MAPCOST and Survey of India and experts from NCA. Preparation of a comprehensive command area development plan was entrusted to MITCON consultants of Pune at estimated cost of about Rs.40.00 lacs. A multi-disciplinary expert group was constituted by the GoMP to supervise and monitor the preparation of this plan. The consultant have already started the work . It was reported that work related to digitization being carried out by NIC with the help of MAPCOST, Survey of India, National Bureau of Soil Science was completed and Coordination/ Development of GIS based plan by NIC was in advance stage . Further progress may please be presented

Members may like to review & discuss.

**(d) FLORA, FAUNA, & CARRYING CAPACITY**

The MOEF conditions for clearance, as far as they related specifically to the Flora & Fauna, were essentially the same as brought under Sardar Sarovar Project.

The objective of the suggested studies was to assess the environmental impacts as a result of the Narmada Sagar Complex, consisting of the three dams: the Narmada Sagar, Maheshwar and Omkareshwar, to ensure minimal adverse effects on wildlife as a result of the project development works. Studies were entrusted to Wildlife Institute of India, Deheradun, Friends of Nature Society, Bhopal, Limnological studies to the Universities (Jabalpur, Ujjain & Bhopal). These institutes carried out studies with a view to address the above concerns and recommended certain mitigation measures, which included the following.

1. Key aquatic vertebrates species like otter was proposed to be restored and translocated. It was suggested to explore the possibility of capturing and translocation of impacted otters of Narmada Sagar into identified localities of the vacant niches in central Indian rivers.
2. Besides, a species restoration plan for aquatic reptile (turtle) was also suggested within the submergence zone and also in other stretches of the river with rocky structure and sandy banks.
3. The restoration program for mugger crocodile as being practised in other districts of M.P. was also suggested.
4. The studies of certain aspects of fisheries and reservoir sciences have been included in the Limnological studies being conducted by the three Universities of the State.
5. Since the topography in the reservoir area consists of rolling hills, the higher peaks to remain above the water surface level and constitute islands in the reservoir. In addition to these small islands, two large islands will be formed to the north and south of the Narmada River just upstream of the Indira Sagar Dam. These islands were required to be protected. As per suggestions of the Sub-group NVDA had presented a plan for protection which was required to be implemented.

**Protection for the wildlife moving out from the submergence area : Status and manner of felling of trees from the submergence area/ National Park / Sanctuaries for ISP and fisheries development :**

**Felling of trees** A plan for felling was required, to ensure protection to wildlife. GoMP reported that felling was under progress in 300 compartments of forest areas, 407 Khasra from 24 villages besides private areas of 125 villages. It was further reported that by the end of March 2007, felling was completed upto 4 meter below the FRL. Environmental consequences of this large scale felling were documented to by the wildlife Institute of India in the EIA studies which called for implementation of mitigation measures, commensurate with progressive filling of the reservoir. WLI recommended, new protected areas namely Narmada National Park, Suryanmaya Sanctuary and Omkareshwar Sanctuary to mitigate the losses. NVDA desired carrying commercial fishing activities on the areas delineated by the WLI Dehradun for declaring National Park & Sanctuaries. Govt. of M.P. reduced the areas by about 35.23%. A map of the area received from NVDA for the



proposed areas is enclosed as Annex LIX -4. It was reported by the NVDA that pending creation of parks/sanctuaries, skeletal staff has been put in place and expenditure is being incurred on procurement of equipments.

According to the communication received from the WLI , there were problems in these areas though felling is already completed and dam was already filled to beyond EL 260 but the required plans were not yet in place . During the last meeting it was agreed that

- The Sub-group desired that NVDA to examine recommendations of the IIM, Ahmedabad related to conservation of Fisheries as applied in SSP and simultaneously the proposal should also be submitted to the appropriate section of the MoEF.
- IIM recommended formation of three tier management of developing fisheries in Sardar Sarovar Reservoir. This included representation of stake holders such as Forest Department, Fisheries Department and professionals & experts with focus on "Project Affected Persons". The issue of SSP was discussed by the High Level Expert Group on Fisheries under the chairman ship of JS (Fy) Ministry of Agriculture and it was agreed to take up joint fishing in SSP, detailed TOR were drafted and sent to party states for concurrence which is awaited
- Pending finalisation of the need of the areas identified for the National Part / Sanctuary by NVDA for fisheries purposes all other areas recommended by the WLI should be notified without any further delay.

Progress may please be presented by the NVDA.

**(e) Seismicity and Rim stability**

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. The Narmada Sagar reservoir has a gross capacity of 12,200 million cubic meters, or about 9.9 million acre-feet, by far the largest-capacity reservoir planned in the Narmada River basin. Therefore the issues of Seismicity and the potential for reservoir-induced seismicity (RIS) were required to be attended as per recommendation of the dam safety review panel, Central Water and Power Research Station, (CWPRS) Pune and Indian Meteorological department (IMD), which suggested: to monitor seismicity during the pre and post-impoundment phases. Network of about five stations each be developed in the Narmada Sagar, Omkareshwar, and Maheshwar areas .

- To record the ground motion intensity and response of the dams for any significant earthquake in the vicinity, installation of three strong motion seismographs at each dam site.
- To record any significant ground motion that occurs during construction, one strong motion instrument near each dam site.

Accordingly, zone a network of 10 seismological observatories with sophisticated instruments was being established. It was proposed to monitor pre and post impoundment seismicity also at these seismic stations to help in assessing the adequacy of seismic parameters adopted for designs. The complete package of seismic digital and analog recorders and sensors have been procured and installed at 10 observatories station. Man power has been deployed for day-to-day operations, maintenance and watch and ward of seismic observatories of ISP on contract basis. It was informed that data was being recorded at all the observatories except at Kannod and IMD has taken over monitoring station located at dam site for acquisition of data and its analysis.

During the last meeting the Chairman directed that proper arrangements should be made for analyzing the collected data by professional identified Institutes through proper terms of references on regular basis, so that, in case, it is observed that progressive filling of the reservoir aggravates the situation, corrective steps can be taken. University of Roorkee / IMD were suggested by the Sub\_group for the purpose. Progress is awaited

Members may like to discuss and review.

**(f) Health Aspects**

Surveys and investigation of the existing levels of health, information on specific diseases besides implementation of the planned measures in time were required in accordance with the order of clearance. Three specific diseases namely Malaria, Schistosomiasis, and Filaria were studied and diseases like leishmaniasis, scabies, etc., were investigated. The geographical reconnaissance study, to identify the potential breeding sites of malaria vector, was suggested. Other key suggestions included

1. Measures to control schistosomiasis should include physical, chemical, and biological means. The biological mitigation measures would include the use of predator species that would eat the secondary host snails.
2. Since the Anopheline mosquito vector has the potential to proliferate in the reservoir, the large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Some experimental resistance of adult mosquitoes to commonly used biocides was noted under laboratory conditions. Thus research to maintain effective biocides was to be continued on long term basis. Land leveling and land filling operations as well as appropriate vegetation clearing were to be integrated. Control measures was to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites.

In pursuance the NVDA was required to update and implement the plan on health aspect for ISP. A copy of the plan was received from the NVDA. It covered the up-stream, dam site, command area and the rehabilitation sites of the Indira Sagar and Omkareshwar projects. The plan estimated to cost Rs.6.49 crores included provisions towards ISP for 30 bedded hospital at Punasa, 1 mobile unit, 29 Sub-Health Centers, 2 Public Health Centers besides strengthening of 6 existing health sub-centers. Provisions for IEC, control of Arthropods, provision of insecticides and surveillance were also incorporated. Observations of the ICMR on the health plan identified gaps in plan. During 43<sup>rd</sup> meeting it was brought out that during the last verification during 2001 by experts, deficiencies were observed in implementation of needed safeguards. Further progress was awaited

Status of compliance / implementation of the plan may please be presented, for perusal /observations and review by the members.

### **(g) Archaeology**

In addition the general obligations of the State under the provisions of the 1958 Act state Govt was to protect Type-I, II and III monuments, according to the directions received from the MoEF the action plan was required to cover the issues on archaeology and anthropology

According to the plan prepared by the Archaeological Survey of India a well situated in the midst of north bastion of Joga Fort, a centrally protected monument of Type-I, will be fully submerged at FRL + 262.10 M. NHDC has taken steps to protect it as per advice of the ASI.

Investigations of the basin revealed that valley was rich in archaeological belongings. A survey of the 254 villages for identification of the archaeological monuments falling within the submergence area was carried out by the State Department of Archaeology and Museum, Bhopal.

Simultaneous survey of 167 villages was completed earlier by the ASI but further progress on completion of survey for the remaining villages was awaited. During the last meeting, Member (E&F), NVDA assured the Sub Group to examine the issue and report back to the Sub Group.

Progress may please be presented by the NVDA.

### **(h) Anthropology**

The Narmada Valley can be divided into three physiographic units (1) Western Vindhyas (2) Narmada through West and South and (3) Western Satpuras. Some Indologists place the Narmada-Chambal civilisation of Malwa as a contemporary of Indus civilisation. Navada Toli is a site contemporary to Harappa where evidence of early farming villages were discovered. Findings of a hominoid skull from Hathnora indicated the possibilities of the existence of human bio-cultural remains within the basin. It was informed by the anthropological Survey of India that Narmada Valley Civilisation is very old and is comparable to pigmies of the Sough Africa. Therefore, it was imperative that required studies should be carried out in the valley before submergence. Anthropological Survey of India was requested to speedup their studies on Narmada to complete the same before Submergence. Progress may please be presented by the Anthropological Survey of India.

NVDA has also planned to establish a Center on Religious and Cultural heritage of the Narmada Basin. Progress may please be presented. NVDA prepared a plan for excavation of five sites in District Dewas, Khandwa. As per the information received from the NVDA excavation works on all the five identified mounds was completed.

A report on findings of the excavations may please be presented for a review by the Members

**(i) Environmental Management of Downstream Areas :**

Management of downstream areas especially with reference to requirement of environmental control focusing on aquatic eco-system, health hazards, quality of water & its suitability for designated uses, Disaster Management Plan was required. The Environment Sub-group during its 38<sup>th</sup> meeting also suggested adequate safeguards for the downstream environment. In response the copy of Management plan for downstream environment was received from NHDC alongwith rules for operation of reservoir. Subsequently a copy of the disaster management plan was also received.

During the last meeting a detailed presentation on the mechanism in place to ensure quality & quantity of releases w.r.t implementation of required environmental safeguard measures was assured by the NVDA/ NHDC for a review by the members.

**Item No. XLIV-5(209): Legal issues arising out of an application filed by SNEH.**

An application has been filed before the Central Empowered Committee Constituted by Supreme Court of India in W.P. No. 202 of 1995 by Shri Dinesh Kothari, President, Society for Nature Education & Habitats which is listed for hearing on 6<sup>th</sup> July, 2007. The main prayer is as follows :

- i. Direct declaration of protected area as per the recommendation of the Wildlife Institute of India i.e. Sanctuary Narmada National Park (496.70 km<sup>2</sup>), Surmánya Sanctuary (126.67 km<sup>2</sup>) and Omkareshwar Sanctuary (119.96 km<sup>2</sup>) comprising of a total area of 788.57 km<sup>2</sup>.
- ii. Diversion of forest area by letter dated 19.08.2004 be declared illegal.
- iii. Direct to conduct fresh Environment Impact Study of the area for suggesting mitigating measures.
- iv. Direct to stop all the tree felling under the working plans & collection of minor forest produce, tendu patta collection etc. From the PA's as proposed by WII till the disposal of this application.
- v. Pass any such other or further order, as this Hon'ble Committee may deem fit and proper in the facts and circumstances of the case.
- vi. Pass any such other or further order, as this Hon'ble Committee may deem fit and proper in the facts and circumstances of the case.

This is for information of the Sub Group

**Item No. XLIV-6(210) : SHARING THE COST OF THE TREATMENT OF FREELY  
DRAINING CRITICALLY ERODED CATCHMENT AREA**

As decided during 43<sup>rd</sup> meeting a separate meeting is being convened to resolve the issue . Progress shall be reported during the meeting

**Item No. XLIV - 7 (211) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

**B. MONITORING WORKS IN MAHARASHTRA**

**Agency for Inter Departmental Coordination for effective implementation of the plans in time and funding of the works on implementation of action plans for mitigation of adverse impacts on environment.**

In pursuance to the recommendations of the Environment Sub-group during 40<sup>th</sup> meeting a series of steps were taken by the Govt. of Maharashtra and Environmental Cell for strengthening Inter Departmental Coordination has been formed. Progress on appointment of Staff, provision of funds, A report on activities of this cell and expenditure incurred thereon may please be presented by the Government of Maharashtra

**C. SARDAR SAROVAR PROJECT : PUBLICATIONS / SEMINARS ENVIRONMENT MANAGEMENT**

During earlier meetings it was desired that good works being done by the Project Authorities are to be published and Seminars. Publication brought out by the project authorities were presented and it was informed earlier that the thrust areas have been identified for publishing success stories. Further progress may please be presented by Gujarat, Madhya Pradesh and Maharashtra.

**D. COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

In order to frame yard sticks on the cost estimates of the water resources Projects, the Chairman of the Sub-group during desired compilation of the estimates and expenditure incurred on survey, studies and implementation of the suggested safeguard measures for the SSP / ISP. Updating of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level is requested from the Govts. of Gujarat, Madhya Pradesh and Maharashtra.



**Item No. XLIV-8(212): ANY OTHER ITEM.**

**DATE & VENUE OF THE NEXT MEETING :**

# ANNEXURE

**Annexure- XLIV- (1)****Key stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India**

- (i) Until approved plan for environmental safeguard measure is implemented water should not be used for irrigation purposes.
- (ii) Command Area Development Plan & Implementation of the water delivery and drainage system along with implementation of the measures proposed in the plan for safeguarding the environment. In addition the Environment Subgroup has issues directions from time to time for guiding the development of Command area Development plan
- (iii) Command area involves both the management of plant as well as human aspects. The details have to be collected on the following:  
Existing land use, irrigation status, cropping pattern, water availability-surface and ground; natural drainage pattern, induced drainage, yield, permeability, precipitation distribution, salinity and alkalinity problems, soil profile, land capability.  
  
Cropping pattern, rationale and controlled water use; training for skills up gradation; package of irrigation water, seeds, fertilizers, insecticides, pesticides with controls; surface and subsurface drainage.
  - 1) Land capability survey of the area which are proposed to be brought under irrigation along with the soil profiles;
  - 2) Identification of the areas prone for water logging and salinity;
  - 3) Details of the drainage works proposed in the command and the norms based on which these details have been planned;
  - 4) On-farm development works proposed and the assistance proposed to be given to the farmers to ensure conjunctive use of water;
  - 5) Details of the present and proposed cropping pattern;
  - 6) Steps proposed to prevent contamination of ground and surface water due to fertilisers, pesticides, runoff.
- (iv) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and In the wasteland/vacant land under the control of the Irrigation Department
- (v) A programme of drainage and ground water balance studies has been completed for Mahi Narmada-Doab. Such a programme must be completed for the areas beyond the Mahi. The Bhal, Saurashtra, Kutch. Sami-Harij and other areas require this as a pre-condition.
- (vi) The State should set up a special group of experts to study the siltation aspect in the main canals under all operating conditions since such siltation, if occurs, is likely to pose a serious problem during the actual operation of this project and may require a huge expenditure for desilting as well as result into serious operational difficulties.
- (vii) State should draw up a detailed time schedule for completion within five years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area of the total command of this project.
- (viii) Past experience of Irrigation projects have revealed that main and branch canals are completed up to the end but, in absence of micro-level networks to take irrigation water up to outlet, corresponding Irrigation benefits do not start

accruing In spite of huge financial investment made. To avoid this, the State should draw up an implementation schedule, segment wise, for completion of canal network, in such a way that a segment of the canal network, taken up from head reaches is completed in all respects so as to make the irrigation waters available, for the designed potential of that segment, up to the outlet In that particular segment.

(ix) Key issues identified by CAD wing of MOWR are as below

- i. Modernisation, maintenance and efficient operation of the irrigation system up to the outlet with discharging capacity of 30 litres per second (1 cusec approx.).
- ii. Development of field channels within the command of each outlet to distribute the water efficiently.
- iii. Land levelling and shaping on an outlet command basis for even distribution of water over the field and to achieve economy in water application.
- iv. Enforcement of a proper rotational schedule of irrigation water delivery for fair distribution of water to each farm holding.
- v. Selection of suitable cropping pattern so that minimum quantity of water may give better results.
- vi. Strengthening of the extension services to disseminate knowledge of optimum water use among the farmers.
- vii. Use of wireless network for proper regulation of water for crop use.
- viii. Construction of field drains in the outlet commands.
- ix. Development and maintenance of the main and the intermediate drainage system.
- x. Promoting conjunctive water use through the development of groundwater for supplementing surface irrigation.

**ANNEX – XLIV-(2)****Tabular Statement on status of Command Area works in Phase-I, in Gujarat.**

S. No.	Suggested actions	Incremental Planning	Annual Targets		Achievements	
			Phy	Fin.	Phy.	Fin.
1.	<b>Agriculture Development</b> <ul style="list-style-type: none"> <li>• Water course and field channel</li> <li>• Land leveling and shaping</li> <li>• Field drains and chak drains</li> <li>• Support and assistance to farms in development of ground water in conjunction with the surface water.</li> <li>• Network of approach roads and eventually farm roads</li> <li>• Marketing and warehousing.</li> <li>• Establishment of agri cultural, research-cum-demonstration farms.</li> <li>• Co-operatives or farmer-friendly structures for inputs and credit facilities.</li> <li>• Provision for supply of seeds, fertilizers, pesticides etc.,</li> <li>• Incremental Communication facilities</li> <li>• Incremental Municipal &amp; civil facilities</li> <li>• Consolidation of land holdings .</li> <li>• Agricultural extension activities.</li> <li>• Problems areas of Bhal and Bara track.</li> </ul>					
2.	<b>Public Health</b> <ul style="list-style-type: none"> <li>• Strict control on supply of water. (Volumetric supply)</li> <li>• Lining of canals</li> <li>• Surface drains</li> <li>• Drainage of borrow areas.</li> <li>• Training at levels</li> <li>• Presumptive treatment and</li> <li>• Curative treatment <ul style="list-style-type: none"> <li>• NMCP</li> <li>• Strengthening of CHCs</li> <li>• Strengthening of PHCs</li> <li>• Strengthening of Sub Centers</li> <li>• Strengthening of Urban Health Services</li> </ul> </li> </ul>	Before commencement of Irrigation				
				20 lacs		
				325 lacs		
				420 lacs		
				4 lacs		
				6 lacs		

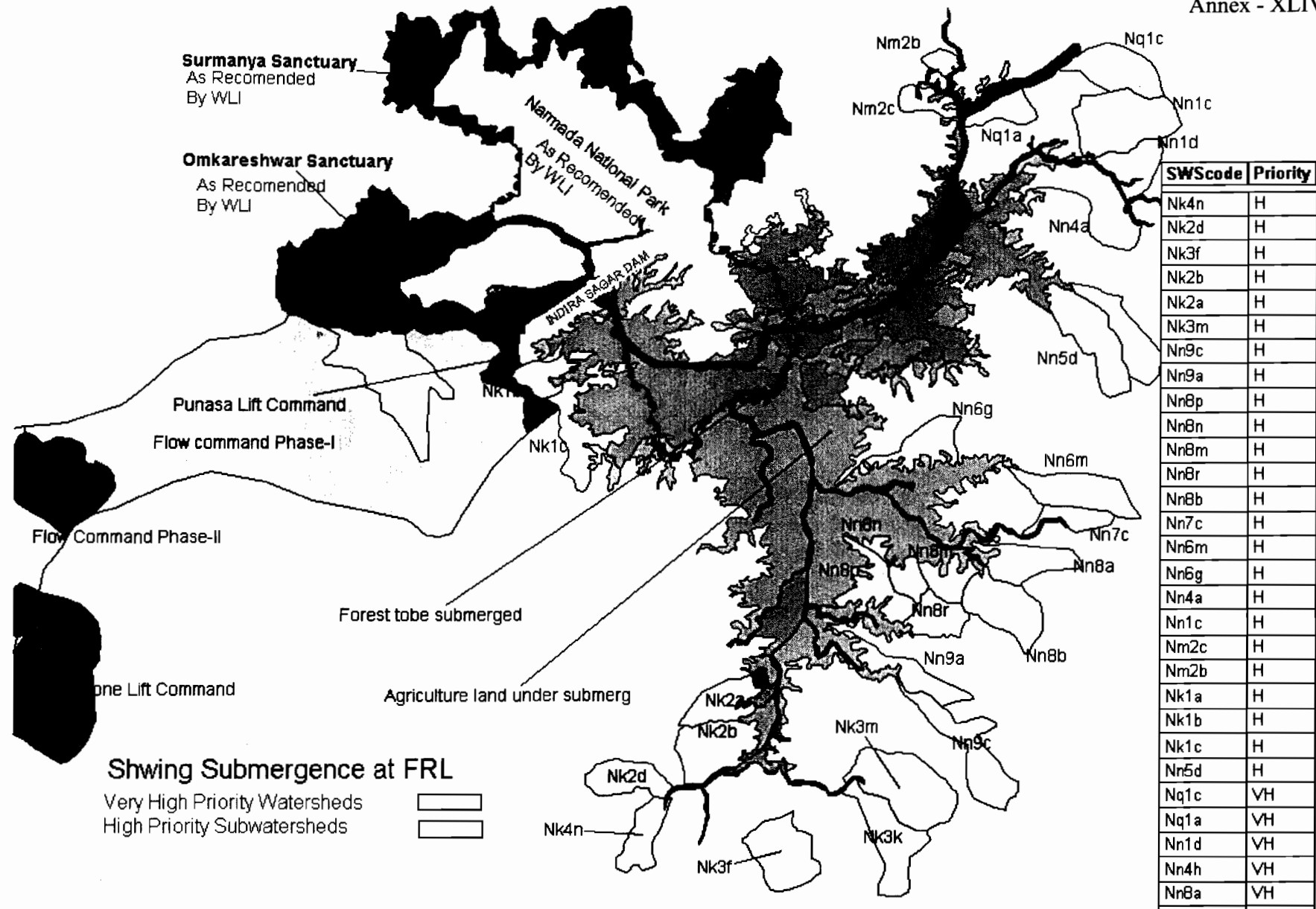
3.	<b>Water quality :</b> <ul style="list-style-type: none"> <li>• Water quality monitoring wells.</li> <li>• Institutional arrangement for monitoring of surface water quality.</li> <li>• Ensuring releases of fresh water for diluting the pollutants.</li> <li>• Regulatory control for prevention of downstream environment by Municipal &amp; Industrial sewage.</li> <li>• Surface &amp; Sub-surface drainage in region -1 to 4.</li> <li>• Regulation for pesticides control. <ul style="list-style-type: none"> <li>○ Research Centers for Biological control.</li> </ul> </li> <li>• Integrated pest management.</li> </ul>					
4.	<b>Water logging &amp; salinity</b> <ul style="list-style-type: none"> <li>• Improving the quality of the soil maps</li> <li>• Volumetric supply of water through computerised system</li> <li>• Improving the design of drainage system. Re-use plan</li> <li>• Ground Water Modelling with new data.</li> <li>• Modelling of regions with rocky strata.</li> <li>• Operationalisation of the drainage studies</li> <li>• Special works on coastal zone.</li> <li>• Location of Piezometers / well</li> <li>• Integration of GWRDC wells in the command.</li> <li>• Institutional mechanism for monitoring water table / quality.</li> <li>• Legal/Financial frame work for utilization of ground water by the WUA for conjunctive use.(included in the cost estimates of the SSP).</li> </ul>					
5.	<b>Downstream Environment</b> <ul style="list-style-type: none"> <li>• Provisions for complimentary flows for mitigating pollutions in the downstream,</li> <li>• Restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone,</li> </ul>					

	<ul style="list-style-type: none"><li>Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality.</li><li>Developing of mathematical modeling for prediction of likely impacts of different operational scenarios for mitigation,</li><li>Studies on ecology and resources for the downstream environment, narrowing of river channel,</li><li>Legal agreement between the party states for regulated releases to ensure that project works as planned.</li></ul>					
6.	<b>Fisherles and Aqua culture :</b> <ul style="list-style-type: none"><li>Linking village tanks to distribution system in about 4,000 ha village pond. And other works from the budget of FFDA and Loan from Bank.</li><li>CAD plan on cost of SSP.</li></ul>					
	o Status paper	9.0 lacs				
	o Modification in capacity of ponds	9.0 lacs				
	o Major carp hatchery	15.0 lac				
	o Project cells.	9.0 lacs				
	• Control fouling from saline aquifers and agricultural chemicals.					
	• Monitoring responsibilities.	FFDA				
	• Arrangements for analysis of Monitored information	Commissioner(F)GOG				
7.	<b>Plantations in the command : Existing schemes. (1980-1992)</b>	Annual Targets		Cumulative achievements		
		P h y.	Fin.	Phy.	Finan.	
	• Strip plantations	10,304 ha	Departmental work prior to SSP			
	• Common lands	12,213 ha				
	• Degraded forests	5,904 ha				
	• Degraded non forest	460 ha				
	• Community forest	29,000 ha				
	<b>Incremental programme (after SSP)</b>					
	• Canal banks	15,000 ha			2,900 ha	
	• Borrow areas	3,000 ha				
	• Community forest	40,000 ha			Nil	
	• Non culturable land	40,000 ha			Nil	
	• Field bunds	1,00,000 ha			Nil	
	• Farm Forestry	1,00,000 ha			Nil	

8.	<b>Flora and Fauna:</b> <ul style="list-style-type: none"> <li>• Development of Botanical Garden</li> <li>• Tree Preservation programme</li> <li>• Bio-Diversity Conservation Plan. <ul style="list-style-type: none"> <li>◦ Environmental stability</li> <li>◦ Coastal zone Eco-system</li> <li>◦ Denuded areas in the Command</li> <li>◦ Increase in tree cover by 5% (outside the forest).</li> <li>◦ Measures for meeting MFP requirements.</li> <li>◦ Awareness programme for people's participation</li> </ul> </li> <li>• Incremental Management of Nal Sarovar Environment</li> <li>• Incremental Management Valvador Environment</li> <li>• Incremental Management of Wild Ass sanctuary Environment</li> <li>•</li> </ul>	Before commencement of the irrigation in the Command	Nil	Nil	Nil	Nil
9.	<b>Monitoring responsibilities in key areas and related training:</b> <ul style="list-style-type: none"> <li>• Environment such as Fisheries, Health, Ecology, Forestry, Agriculture, Horticulture, Veterinary, Extension Centre, Wild Life, Bio-technology, Soil etc.</li> <li>• Engineering such as Ground Water, Pollution, Salinity, Water Management etc.</li> </ul>					
10.	Arrangement for Data Management (GIS) for Managers of the project in future years.					



## Annex - XLIV - (3)





केवल सरकारी प्रयोग के लिए  
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**पर्यावरण उपदल**  
**ENVIROMENT SUB-GROUP**

**चवालीसवीं बैठक का कार्यवृत्त**  
**Minutes of the 44<sup>th</sup> Meeting**

**16 जुलाई, 2007 को**  
**पर्यावरण भवन, नई दिल्ली में हुई**  
**Held at Paryavaran Bhavan, New Delhi on 16<sup>th</sup> July, 2007**

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**सितम्बर, 2007**  
**INDORE**  
**September, 2007**

# MINUTES OF THE 44<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP

## I N D E X

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**MINUTES OF THE 44<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NCA HELD ON 16<sup>th</sup> July, 2007  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

The 44<sup>th</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held on 16<sup>th</sup> July, 2007 at Paryavaran Bhawan, CGO Complex, New Delhi under the Chairpersonship of Mrs. Meena Gupta, Secretary, Ministry of Environment & Forests (MoEF), Govt. of India.

List of participants is enclosed at **Annex-XLIX-Min-(1)**.

The Chairperson at the outset welcomed all participants to the meeting and after self introduction of the participants, the agenda items were taken up for discussions .

**Item No.XLIV-1(199) : CONFIRMATION OF THE MINUTES OF THE 43rd MEETING  
OF THE SUB-GROUP.**

No comment was received from any member. Accordingly minutes of the 43<sup>rd</sup> meeting as circulated vide letter of NCA dated 9<sup>th</sup> February, 2007 were confirmed.

**Item No.XLIV-2(206): REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES – PRESENTATION OF THE REPORT OF THE COMMITTEE.**

and

**Item No. XLIV-3(207):REVIEW OF IMPLEMENTATION OF THE ENVIRONMENT SAFEGUARD MEASURES OF SARDAR SAROVAR PROJECT: COMMENSURATE WITH PROGRESSIVE FILLING OF THE RESERVOIR**

Director (Environment), NCA informed that in pursuance to the directions of the Sub-Group, field visits were undertaken to the SSP areas in Gujarat and SSP & ISP areas in Madhya Pradesh and that a visit to the areas in Maharashtra was being organized by the end of September, 2007.

The field visits' reports, identified key area where implementation was inadequate and required strengthening. The key concerns had been presented in the agenda notes as summary recommendations, requiring actions on priority.

During the last meeting, it was directed that the State Govts. should submit status of compliance on the recommendations of the committee at the earliest. Accordingly, Chairperson invited State Govt. representatives to present current status of compliance

**Sardar Sarovar Project:**

**1.Catchment Area Treatment**

**Govt. of Gujarat**

As regards efficacy of CAT works, CMD, SSNNL stated that CSWCR & TI has been carrying out the studies. The report of 2006 is awaited from the Institute. He further informed that work on assessment of Catchment Area Treatment Works has been entrusted to GEER Foundation. However, the report was awaited.

**Govt. of Madhya Pradesh**

Member (Environment & Forest), NVDA stated that considering that the silt monitoring data for pre-treatment phase was not available, such assessment was not required. He further stated that data from CWC and Forest Survey of India could be utilized if so required. He informed that establishment of silt monitoring stations for Phase-II is being undertaken by the Govt of Madhya Pradesh.

Director (Env.), NCA pointed out that after due consideration, the Sub Group had directed , dedicated focused monitoring for assessment of the efficacy of the Catchment Area Treatment works. Such works were already undertaken for the areas

in Maharashtra and Gujarat and therefore, it should be possible for Madhya Pradesh also to undertake such studies with the help of identified Institutions.

Dr. Shekhar Singh suggested that Govt of Madhya Pradesh should explore the possibility for undertaking assessment either through Satellite imageries or through aerial photography or a combination of both as already suggested by the sub group earlier.

It was suggested by the Chairperson that dedicated focus monitoring as already decided upon by the Sub Group earlier should be undertaken without further delay.

## **2. Compensatory Plantation**

### **Govt. of Gujarat**

Conservator of Forest, SSNNL stated that recommendations of the Committee of the Sub Group are being followed and that works on replacement of casualties and maintenance of the plantations was already undertaken

After some discussions on the issue it was suggested that a plan along with implementation report should be submitted.

### **Govt. of Madhya Pradesh**

Member (Environment & Forest), NVDA stated that as the areas treated were already handed over to the respective owners therefore, it was not possible to revisit the areas for any maintenance work. Farmers carry out maintenance work on their field at their own. Regarding quality of compensatory plantation work it was informed by him that average survival was 41% but considering that the exercise of assessment would be prohibitively costly and time consuming there was no need for any kind of assessment. Regarding seismic monitoring stations, he stated that these were being maintained by the SSNNL.

Managing Director, SSNNL stated that seismic monitoring stations are being maintained by the SSNNL and data is analysed regularly through qualified experts

The progress presented by Govt of Madhya Pradesh was reviewed in detail and it was observed by the Chairperson that on most of the items view point expressed by Govt of Madhya Pradesh was that either these could not be done or not desirable. She stated that this approach is counterproductive and Govt of Madhya Pradesh should take steps for implementation of the directions of Sub Group in time.

### **3. Command Area Development works :**

#### **Govt. of Gujarat :**

The CMD, SSNNL highlighted key features of the command area in Gujarat. He stated that revised Macro plan for the development of the Phase-I Command Area had recently been sent to Narmada Control Authority office at Indore. This plan incorporated proforma on identified mechanism of monitoring. He informed that about 4 lac ha area would be taken up for irrigation in Gujarat from ensuing season.

Director (Environment) NCA acknowledged the receipt of the said Plan on 10<sup>th</sup> July, 2007 and stated that preliminary scrutiny of the plan revealed substantial changes in the original planning especially with regard to irrigation and the source of impacts. He pointed out that while earlier plan envisaged a duty of 53 cm on regulators at minors' outlet, the present plan provided 55 cm of water at Main Canal Head Regulator without consideration of any application losses. This implied that the actual water reaching the field, with a consideration of losses of 60% under very conservative estimates, is likely to be of the order of depth of water of 20 to 25 cm. This required a detailed study of the plan to appreciate the rationale of the Govt of Gujarat. He pointed out that changes in the irrigation planning shall also bring corresponding changes in its impact on environment. He, therefore, expressed the view that, to assess the plan and strategy of the State Government vis a vis impact on environment, consideration of the whole issue through a Committee of Experts, was necessary before approval of the plan by the Sub Group.

Shri B.G.Verghese referring to the progress on development works in Command Area presented in the Agenda Notes stated that there was a need to study the plan as the measures originally planned for mitigating adverse consequences by development of the Command Area not fully implemented. He requested more time for studying the plan for considered comments.

Prof. R.K. Katti suggested that studies related to synchronized operation of the Dam, storm water drainage vis-à-vis water logging in the command were also required while planning irrigation in the area

Dr Shekhar Singh pointed out that change in the irrigation planning has to be looked into from the angle of the conditions of clearances given by the MoEF and the Planning Commission. He further stated that implementation of the mitigation measures planned for the areas already irrigated was missing and suggested a detailed



review of the plan.

After some discussions, it was decided to form a Committee of Experts to review the plans for development of the Command Area. It was agreed that committee would review the plan presented by the State Govt of Gujarat in view of the various conditions of clearances given by the MoEF and the Planning Commission and adequacy of the irrigation planning and mitigation measures for safeguarding the environment. The Committee would submit its report within a period of three months, well before the next meeting of the Environment Sub Group. Govt of Gujarat suggested to include irrigation experts also in the Committee of Experts, which was agreed to.

#### **Downstream Management Plan**

Director (Environment) NCA stated that a plan for management of the downstream areas below the SSP Dam upto the gulf of Cambay was required by the Sub Group in accordance with the conditions of environmental clearance. The Environmental Resource Management of United Kingdom - the Agency engaged for preparation of an EIA report for management for the downstream areas by Government of Gujarat had also made certain recommendation in 1994-95. The Govt of Gujarat assured the Sub Group for timely implementation of the recommendations. A plan for implementation of mitigative measures in the downstream reach of Sardar Sarovar Project as promised by Govt of Gujarat is still awaited.

C.M.D., SSNNL stated that interim plan for downstream management was already in place. However the finalization of the plan is pending for want of completion of some of the studies, which are still under progress.

After some discussions on the issue, Chairperson directed submission of the Downstream Management Plan before the next meeting of the Sub Group.

#### **Downstream flows**

Director (Env.), NCA stated that in pursuance to the recommendations of the EIA studies, Government of Gujarat promised to ensure release of 600 cusec of water to fulfill the requirements of downstream areas to be monitored on hourly basis by the NCA. Though initially there were slippages but of late necessary arrangements have been made for monitoring by Sardar Sarovar Reservoir/Regulation Committee of NCA for the release of promised quantity of water as directed by the Sub Group. Managing Director, SSNNL stated that minimum required flow of 600 cusecs is being maintained

on hourly basis.

Shri B.G. Verghese pointed out that there has been considerable variation in the hydrological pattern, as presently north east is facing drought whereas there were floods in the desert areas of Gujarat & Rajasthan. In view of this there was a need for study of impact of Climate change also.. Dr. Shekhar Singh suggested that there was a need for setting up infrastructure for monitoring of downstream water management on a long term basis

#### **Govt. of Rajasthan**

Director (Env.), NCA informed that in pursuance to the directions of the Environment Sub-group a meeting was held to review the plan received from Govt. of Rajasthan. It emerged from the discussions that there was a need to carry out EIA of Biological Resources in the Command and a review of the irrigation plan was necessary, with the help of Central Arid Zone Research Institute, Jodhpur. Govt. of Rajasthan has agreed on the suggestions for setting up a Multidisciplinary Expert group on the lines, these are set up by Govt. of Gujarat & Govt. of Madhya Pradesh.

Representative of the Govt. of Rajasthan state that Wildlife Institute of India also agreed to take up EIA studies, the terms of references of which are under finalisation.

#### **4. Flora and Fauna : Conservation of rare species/variants**

Director (Env.), NCA pointed out that though some general development works in the sloth bear sanctuary by the forest department had been undertaken, but the plan for implementation of the recommendations contained in the EIA studies was yet awaited.

#### **Govt. of Gujarat**

C.M.D., SSNNL stated that plan for conservation was under implementation.

The Chairperson directed submission of the plan before the next meeting for consideration of the Sub Group.

#### **Govt. of Madhya Pradesh:**

##### **Terrestrial Eco-system**

Member (Environment & Forest), NVDA stated that EIA studies for consideration of protected areas for the SSP to rehabilitate wildlife impacted by the Sardar Sarovar Project have already commenced by the Wildlife Institute of India and the report was expected shortly. It was further informed by him that Govt of Madhya Pradesh has

taken up steps for the implementation of social forestry plan to increase availability of forest produce and to reduce burden on the existing forest.

Dr. Shekhar Singh pointed out that the study itself was under progress and implementation of the resulting recommendation could not be carried out *pari pasu* as stipulated in the order of clearance.

Dr. V.B. Mathur, Dean Faculty of Wildlife Institute of India stated that as per the reports received from study group the fringe areas of the Sardar Sarovar Project can only be considered for extending protection under conservation reserve whereas the other area given for study is near Ratanmahal Sanctuary of the Govt of Gujarat and these areas showed good evidences for consideration of a notification of a National park/sanctuary.

#### **Aquatic Eco-system**

Member (Environment & Forest), NVDA stated that the plans for conservation of fisheries would be updated after receipt of the guidelines on the same from NCA

Director (Env.), NCA pointed out that guidelines for conservation and development of fisheries were framed by the Expert Group constituted by the NCA, chaired by Jt. Secretary, Ministry of Agriculture during 7<sup>th</sup> Meeting held during 2004. These guidelines were widely circulated to the State Governments towards updation of their plan. This was yet awaited. He further pointed out that there were 8 species of fishes identified by the CICFRI, as vulnerable. These species required protection, for which state governments were required to take identified action. No action seems have been taken in Madhya Pradesh through impoundment commenced during 1994. Opportunity for scientific management of the reservoir already seems to have been missed

#### **5. Felling of trees**

##### **Govt. of Madhya Pradesh**

Member (Environment & Forest), NVDA stated that except for some 3000 trees, all trees in the submergence zone were felled. It was further informed Member (E&F) , NVDA that , it was not possible to remove coppice crop from the submergence zone due to lack of required road net work.

The issue was discussed in details and it was suggested by Director (Env.), NCA that all steps should be taken for removal of coppice crop from the submergence zone as it has serious negative consequences on the overall environment due to eutrophication, proliferation of disease vector, corrosion of turbine-blades, production of

methane gas etc. Besides it has serious negative consequences for development of fisheries in the reservoir as it also damages boats and nets besides producing fish kill. He referred to the case of Brokapando Lake where the costs incurred on removing vegetation after submergence was several time more than the total cost of the project itself

Dr. B.G. Verghese suggested that in case it was not possible to remove coppice crop departmentally, it could be done by contract work

Dr. Shekhar Singh suggested that removal of coppice crop may not be economically viable for obvious reasons but considering the negative impact that it generates it should be removed on priority

Shri Inderraj, Commissioner (PR) stated that considering the enormous costs involved on removing submerged vegetation after completion of the project, it is desirable that such crops should be removed before submergence.

## **6. Health Aspects**

### **Govt. of Gujarat**

C.M.D., SSNNL stated that existing State health services in the Command Area were adequate for any emergency requirement besides services of Malaria Research Centre at district Nadiad were also available.

Director (Env.), NCA pointed out that Govt of Gujarat submitted a 17 year health plan for implementation commensurate with progressive development of Command Area. Implementation of the plan submitted to the Sub Group was awaited.

The Chairperson desired submission of the report on implementation of the plan.

### **Govt of Madhya Pradesh**

The Sub Group was informed that reports on disease monitoring was awaited

### **Govt of Maharashtra**

Director (Env.), NCA stated that last review of the progress of work was undertaken by Principal Secretary (Environment), Govt of Maharashtra, this review was attended by the Director (Env.) and deficiencies in implementation of environment safeguard measures was appraised therein. The field visit to the areas in Maharashtra is planned for the last week of September, 2007 and it is expected that it would be completed before the next meeting of the Sub Group.

## 7. Seismicity & Rim Stability

### Govt. of Madhya Pradesh

Regarding seismic monitoring stations, Member (Env. & F), NVDA stated that these were being maintained by the SSNNL.

### Govt. of Gujarat

Managing Director, SSNNL stated that seismic monitoring stations are being maintained by the SSNNL and data is analysed regularly through qualified experts

The Status of compliance on the Action Taken Report (ATR), as emerged from the discussions is presented below

### Sardar Sarovar Project : Govt. of Gujarat

S.N o.	Issues	Recommendations	Current Status
1.	Command Area Development works(protective and restorative). <b>Urgent</b>	Implementation of all identified Environment Safeguard measures is required <u>pari-passu</u> with the development of command area for which Government has to take immediate actions.	Irrigation Commenced in phase-I area. GOG submitted a copy of the revised Action plan June 2007 Preliminary scrutiny of the plan revealed wide gaps therefore decided to constitute an expert group to examine the adequacy of the planned measures
2.	Downstream management plan <b>Urgent</b>	To be prepared and implemented at the earliest without further delay.	Action plan yet not finalised by Government of Gujarat
3.	Downstream flows <b>Immediate</b>	Minimum quality of water required for protection of d/s environment is mandatory and has to be ensured.	Steps have been taken to streamline measures for monitoring by Sardar Sarovar Reservoir Regulation Committee of NCA
4.	Flora and Fauna: Conservation of rare species / variants <b>Urgent</b>	Part area of sanctuaries should be developed as a garden for multiplication of identified rare species, local areas along the canal to be developed to conserve local herbs, shrubs tree species.	Action plan yet awaited
5.	Felling of trees <b>Urgent</b>	To be taken up/ completed in planned manner commensurate with progressive filling of the reservoir.	Summary statement submitted during the meeting found inadequate Detailed report yet awaited
6.	Ex-situ & in-situ biodiversity conservation in the	To be taken up before commencement of irrigation.	Action plan awaited

	command. <b>Urgent</b>		
7.	Health <b>Urgent</b>	Considering reported rise in diseases and consequent high risk qualified experts may be involved in preventing recurrence of various diseases.	Detailed report Commensurate with Action Plan submitted is yet awaited
8.	Efficacy of Catchment area treatment works. <b>Long term</b>	Study to continue at least for a three years period	Awaited
9.	Compensatory plantation <b>Long term</b>	1. There is a need to prepare a list of successful species and to keep the germ-plasm ready for plantations to be taken up in future in the same areas.	Awaited
		2. There is a need to provide for replacement of casualties due to death decay or wilting and to provide support for artificial propagation of the species planted up. If necessary, help from organisation like Arid Zone Research Institute of Central / State Govts. may be obtained.	Detailed report awaited
		3. There is a need to establish seed orchards / clonal orchards for providing support for the activities suggested in para one.	Plan Awaited
		4. There is a need to consider culture of Rhizobium for development of root nodules.	Plan Awaited
		5. There is a need to keep in check infestation of termite through Silvi cultural / chemical control.	Plan awaited
		6. In future sufficient number of fruit and fodder trees may be planted up for supporting wildlife in the area of sanctuary.	Ongoing process. Report awaited

		7. These areas may also be utilised for raising palatable grasses to be as valuable source for protection of these plantations.	Report awaited.
		8. Financial support for keeping planted area in good condition in terms of watch & ward, replacement of casualties and research & development work for promoting natural / artificial regeneration of the identified species.	Action plan awaited.

### Sardar Sarovar Project in Madhya Pradesh

Parameters	Recommendations	Status
Flora Fauna & Carrying Capacity (Terrestrial Eco-system)	EIA studies should be expedited and recommendation implemented before submergence. Impacts have commenced but safeguards measures are not in place.	Field studies commenced report is expected shortly. Social Forestry plantations were progressing
Aquatic Eco-system	Up-dating of plan and implementation should be high priority. Impacts have commenced but safeguards measures are not in place.	Not yet started. Up-dation of plan awaited.
Health Aspects	Implementation of the action plan on ground should have been completed and disease monitoring required on long term basis.	GoMP reported progress on health facilities being created at R& R sites. Report on implementation of plan of peripheral villages submitted is yet awaited.
Felling of trees	Coppice crop of the forest felled earlier required removal on priority.	Completed, detailed report yet awaited. Coppice crop not yet removed.
Quality of CAT works	Silt monitoring is to be started as early as possible.	Not yet started
Catchment Area Treatment (Physical)	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.	Plan for maintenance of works to be carried out on Government land awaited.
Compensatory Plantation Physical targets	To revisit the areas for maintenance & casualty replacement.	GoMP declined to revisit the areas
Quality of CAF works	Crop Diameter and Crop height required to be assessed by complete enumeration through identified agencies.	Detailed report through remote sensing/ aerial photography awaited
Seismicity & Rim	Recommendations of the dam	Station in MP are being maintained by

Stability	Safety review panel should be put up to the Sub Group from time to time IMD may be requested to provide V-Set communication facilities for all observatories.	SSNNL.
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**Sardar Sarovar Project in Maharashtra:**

Visit to the areas in Maharashtra	Awaited.	Visit to be planned September/ October 2007 and presented to the ESG.
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Dr. Shekhar Singh suggested that on most of the items in all the three States the progress presented is abysmal as the Agenda most of the places reads as awaited. He therefore, suggested that further discussions on the Agenda item could be deferred and State Governments should be asked to give updated status for a review of the Sub-group and that this status should be reflected in the Agenda to be circulated at-least 10 days in advance so that meaningful contribution could be made by the Members of the Sub Group.

The progress presented by state Govts. was reviewed and it was observed by the Chairperson that on most of the items view point expressed by Govt of Madhya Pradesh was that either these could not be done or not desirable. She stated that this approach is counterproductive and Govt of Madhya Pradesh should take steps for implementation of the directions of Sub Group in time. It was agreed that all the items on which information is awaited shall be made available by all the States in time for incorporation in the agenda papers, for a detailed review, before the next meeting.

In view of the above & also due to paucity of time and pressing engagement of the Chairperson elsewhere further discussion on the Agenda items was deferred until next meeting. Chairperson however directed that all reports, studies and progress made by the party States towards implementation of environment safeguard measures in accordance with the suggestions of the Sub Group should be made available by the end of September, 2007 and that the next meeting of the Sub Group to review the progress would be held in October, 2007. The exact date of the meeting shall be communicated by NCA in due course of time.



**Item No. XLIV-5(209): Legal issues arising out of an application filed by SNEH.**

Director (Env), NCA brought to the notice of the Sub Group that an application has been filed before the Central Empowered Committee constituted by the Supreme Court regarding the issues related with protection to the wildlife displaced due to submergence of the Indira Sagar Project. Department (s) of the State Govt of Madhya Pradesh, the Narmada Control Authority and the Ministry of Environment & Forest have been made respondents. The initial hearing of the case was on 6<sup>th</sup> July, 2007, where representative of the MoEF was not present and three weeks time was given for filing replies.

The Chairperson suggested that since the issue was related with Wildlife conservation, the Wildlife Division would be representing the Ministry of Environment & Forest and that the issue could be discussed with them further.

**Item No. XLIV-6(210) : SHARING THE COST OF THE TREATMENT OF FREELY  
DRAINING CRITICALLY ERODED CATCHMENT AREA**

Director (Env.) informed that a special meeting convened by Secretary, MoEF and Chairperson, Environment Sub-group on 9<sup>th</sup> July 2007 of representatives of NCA, Party States, MoWR, MoEF and Planning Commission. After detailed deliberations, it was decided to undertake both Phase-I and II CAT works at the cost of SSP.

**Item No. XLIV-8(212): ANY OTHER ITEM.**

The representative of the Ministry of Agriculture with the permission of the Chairperson sought to raise the issues related with funding for treatment of the Catchment Areas of the river valley projects. He suggested that there were provisions for providing funds for treatment of Phase-II areas.

Commissioner (PR), MoWR stated that considering the large extent of the Catchment requiring treatment in a 5 years period, the requirement of funds would be of the order of 100 crores per annum, as brought during the meeting convened on 10<sup>th</sup> July, 07 by the Chairperson,

Representative of the Ministry of Agriculture stated that utilization of 100 crores per annum by Govt of Madhya Pradesh alone may not be feasible. He however, envisaged funding of the order of Rs.1 to 1.5 crores p.a. matching with availability of resources and manpower, at the command of the State Govt of Madhya Pradesh

Director (Env.), NCA pointed out that the point raised by the Govt of Madhya Pradesh related to of matching grants (80:20) by the State to secure Central funding, besides it was pointed by the Govt of Madhya Pradesh that the RVP Scheme was mainly a loan to be paid back with penal interest in case of failure and this was stated to be the hindrance in utilisation of the grants

The discussions remained inconclusive and required more inputs and details. It was therefore, suggested that the issue may be put up for discussion in the next meeting.

# ANNEXURES

**ANNEX-XLIV-Min-(1)**

**LIST OF PARTICIPANTS OF THE 44<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 16<sup>th</sup> July, 2007 AT PARYAVARAN BHAWAN, NEW DELHI.**

**Ministry of Environment & Forests, New Delhi**

1. Mrs. Meena Gupta, Secretary, MOEF, New Delhi.
2. Dr R Annanda Kumar, Adviser, MoEF, New Delhi
3. Dr. S. Bhowmik, Addl. Director, MOEF, New Delhi.

**Narmada Control Authority**

1. Shri V.K.Jyothi, Executive Member, NCA, Indore
2. Shri M.K.Sinha, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore
4. Shri Kuntal Roy, Dy. Director (Env.) NCA, Indore.
5. Shri Upendra Singh, Dy. Director (Env.) NCA, Indore.

**Ministry of Water Resources**

1. Shri Inderraj, Commissioner (PR)

**Ministry of Agriculture (Department of Agriculture Cooperation)**

1. Shri C.M. Pandey, Dy. Commissioner (Natural Resource Management)

**Ministry of Environment & Forest, Regional Office, Bhopal**

1. Dr. B.N. Mohanty, CCF/Central

**Sardar Sarovar Construction Advisory Committee**

1. Shri Nirmal Jot Singh, Secretary, SSCAC, Vadodara

**Indian Council of Agricultural Research**

1. Dr. A.K. Gogoi, ADG (Agronomy)

**Botanical Survey of India**

1. Dr. K.P. Singh, Joint Director, B.S.I., Allahabad

**Wildlife Institute of India**

1. Dr. V.B. Mathur, Dean, Faculty of Wildlife Sciences, Wildlife Institute of India, Dehradun.

**Expert Members**

1. Prof. R.K Katti Expert Member, New Delhi.
2. Dr. Shekhar Singh, New Delhi
3. Shri B.G. Varghese, Expert Member,

**GOVERNMENT OF GUJARAT**

1. Shri P.K. Laheri, Chairperson /M.D., SSNNL, Gandhinagar.
2. Shri G.P. Joshi, Director (F), SSNNL.
3. Dr. S.D. Vora, Conservator of Forests, SSNNL, G'Nagar..

**GOVERNMENT OF MADHYA PRADESH**

1. Shri R.S.Negi, PCCF & Member (E&F), NVDA, Bhopal

2. Shri L.K. Wagh, Advisor, NVDA, Bhopal.
3. Shri R.K. Behre, SMS (CAD), NVDA, Bhopal
4. Shri V.B. Bhatt, Sr. Manager (Env.) , NHDC, Bhopal

**GOVERNMENT OF MAHARASHTRA**

1. Dr. V.L. Kulkarni, Jt. Director, Health Services, Govt. of Maharashtra.
2. Dr. B.N. Patil, SC-I, Cum Deputy Secretary (T), Environment Department, Govt. of Maharashtra, Mantralaya, Mumbai.

**GOVERNMENT OF RAJASTHAN**

1. Shri R.M. Mishra, Addl. Secretary, Dept. of Environment, Govt. of Rajasthan, Jaipur.
2. Shri Jaipal Singh, Chief Engineer, Narmada Canal Project, Sanchoe (Raj.).
3. Shri H.R. Shrimal, SE, Narmada -II, Sanchoe, Rajasthan.

केवल सरकारी प्रयोग के लिए

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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**पैतालीसवीं बैठक की कार्यसूची**  
**Agenda for the 45<sup>th</sup> Meeting**

स्थान : पर्यावरण भवन, नई दिल्ली ।

Venue : Paryavaran Bhawan, New Delhi

दिनांक 24 अप्रैल, 2008 को 02.30 अपराह्न

Dated : 24<sup>th</sup> April, 2008 02.30 P.M.

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**INDORE**

# **AGENDA FOR THE 45<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP**

## **I N D E X**

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## **AGENDA FOR THE 45<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP**

### **Item No. XLV-1(2005) : CONFIRMATION OF MINUTES OF THE 44<sup>th</sup> MEETING OF THE ENVIRONMENT SUB-GROUP.**

Minutes of 44<sup>rd</sup> Meeting of Environment Sub-Group of Narmada Control Authority held on 16<sup>th</sup> July, 2007 were circulated to all Members and Invitees vide Narmada Control Authority office letter No. Env-3(44)/2007/3027-3067 dated 20.09.2007.

Government of Madhya Pradesh, vide their letter of 6<sup>th</sup> Oct. 2007, copy placed at **Annex-XLV-1** has sought modifications in the minutes. GoMP again vide their letter dated 30<sup>th</sup> Oct. 2007 & again vide their letter dated 7<sup>th</sup> Nov. 2007, requested for modification under item XLV-8(212). **Annex-XLV-2**

Govt. of Gujarat, vide their letter No.948 dated: 22<sup>nd</sup> October, 2007 copy placed at **Annex-XLV-(3)** conveyed that decision taken on 9<sup>th</sup> July, 2007 regarding sharing of the cost of Catchment Area Treatment may not be treated as finally decided.

Minutes are put up for confirmation.

**Item No. XLV-2(206): INDIRA SAGAR PROJECT : REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES**

**(b) INDIRA SAGAR DAM: SUBMERGENCE (PROGRESSIVE) AT EL 262.00 M.**

Indira Sagar Project (ISP) formerly known as Narmada Sagar Project has an installed capacity of 1000 MW and annual irrigation of 1.69 lacs ha. The project is very crucial due to requirement of regulated releases of 8.12 MAF of water from this project for SSP.

After getting necessary clearances the construction works were started in May, 1992 and the dam was targeted to be completed by June, 2000. However, due to various reasons the progress lagged behind. Subsequently, the work was handed over to Narmada Hydroelectric Development Corporation (NHDC), a Joint Venture of Govt., of Madhya Pradesh and National Hydroelectric Power Corporation. As per the available information the constructions works have been completed and reservoir has been filled upto EL 260m. Accordingly the ISP is due to submerge an area of 91,000 ha., which would impact land, Flora and fauna etc.

The status of compliances on Environmental parameters was assessed, during 2006 by the committee of Environment Sub-group and the conclusions derived are presented in the table below. Committee suggested that actions be taken on priority in the areas, where there is possibility of infringement and accelerate the actions in the areas of concern

Priority	Parameters	Status	Whether pari-passu	Recommendations of Committee of Env. Sub-Group./ Status of works.
Very high priority. Should be expedited immediately before submergence	Flora Fauna & Carrying Capacity (Terrestrial Eco-system)	Studies completed. Intention plan yet to be translated into Action Plan.	Possibility of infringement.	Concerns raised by WLI should be resolved on priority. Declaration of Sanctuaries / National Park awaiting approval of the State Cabinet for the last one decade, impacting flora & fauna from the submergence adversely. The Sub-group has given directions in this regards.
Priority before submergence	Aquatic Eco-system	Not yet started. Updation of plan needed.	Possibility of infringement.	Updation of plan and implementation should be given high priority.
Short term High priority issues	Health Aspects	In progress.	Area of concern	Implementation of the action plan on ground should have been completed and disease monitoring required on long term basis.
Priority before submergence	Felling of trees	Coppice crop & secondary species left over in the field, required removal.	Area of concern	Coppice crop & secondary species left over in the field, required removal on priority, even if un-economical for preventing degradation of the Environment.
Short term High priority issues.	Command Area Development	Preparation of EIA report & Management progressing	Not Assessed	Dam is ready, Command area planning and implementation is much behind schedule. This should be speeded up.
High Priority	Quality of CAT works	Not yet started	Progressive in nature	Silt monitoring is to be started as early as possible.
Long term priority	Compensatory Afforestation Physical targets	Nearly completed	Yes	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.

Long Term priority	Quality of CAF works	Not yet started	Progressive in nature	Crop Diameter and Crop height required to be assessed by complete enumeration through identified agencies.
Long Term Priority	Catchment Area Treatment (Physical)	Nearly completed	Yes	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.
Long term Priority	Seismicity & Rim Stability	In progress.	Yes	Annual maintenance contract required urgently, IMD may be requested to provide V-Sat communication facilities for all observatories.

As directed by the Chairman during 42<sup>nd</sup> meeting, that Govt. of Madhya Pradesh may like to make a presentation on fulfillment of the pari-passu requirement for the Indira Sagar Project.

**(B) CURRENT STATUS OF IMPLEMENTATION OF THE ENVIRONMENTAL SAFEGUARD MEASURES COMMENSURATE WITH DAM HEIGHT OF FULL RESERVOIR LEVEL.**

**(a) CATCHMENT AREA TREATMENT (in ha)**

As per stipulations, considering the construction schedule, works in the entire Phase-I area is required to be completed before impoundment. The updated progress as available in this office is presented below.

**PHASE-I, Physical Targets (Area in Ha.)**

		Area in ha.	Treated by NVDA	Covered under Comp Plantation / other schemes	Total area treated	Balance Area proposed to be treated by State Forest Deptt /NVDA
<b>PHASE-I</b>	Non-forest	49837*	49598	00	49598	239
	Forestland	11515**	4273	4587	8860	1833
	Total	62,975	53871	4587	58458	2072

\* Revised targets as per micro planning including unworkable area of 2090 ha.  
Earlier targets were 51,927 ha

\*\* Revised targets as per micro planning (including unworkable area of 822 ha)  
Earlier targets were 11,048 ha

**Quality Assessment**

It was directed by the Sub-Group that dedicated focused monitoring of the executed CAT work was essential for assessment of the efficacy of CAT and CAF works.

**Forest areas:** Progress is awaited.

**Non forest areas:** Progress is awaited.

**PHASE-II : Physical Targets (Area in Ha.)**

Treatment of Phase-II areas as per requirements of MoEF was directed by the order of the committee of Secretaries vide decision conveyed by MoWR dated 8<sup>th</sup> July 1992. Subsequently, as per decisions taken during meeting held on 9<sup>th</sup> July 2007, schemes for treating the Phase-II area are required to be implemented at the cost of the project. It was directed that a realistic plan for treating the balance area would be submitted for completion during the next 5/6 years time. This is awaited.

		Area in ha.	Treated by NVDA	Covered under Comp Plantation / other schemes	Total area treated up	Balance Area proposed to be treated by State Forest Deptt /NVDA
<b>Phase-II</b>	Non forest	806720	20734	00	20734	894416
	Forestland	108430				

Members may like to discuss & review.

**(b) COMPENSATORY PLANTATION : Planning and progress**

Ministry of Environment and Forest vide letter No. 8-646-84-FC Dated the 7<sup>th</sup> Oct. 1987 permitted diversion of 41,111.97 hectares of forest land in Khandwa, Dewas and Hoshangabad districts for the Narmada Sagar Multipurpose Project. under Section 2 of the Forest (Conservation), Act, 1980, subject to the following key conditions that :

1. Compensatory plantation will be carried out over suitable degraded forest land double the diverted forest area in extent and in addition to the equivalent area in non-forest land. However subsequently the scheme for compensatory plantation submitted vide letter Nos. F.D /AAA/ AO/3 dated 13.11.1987, as detailed below was approved by the MOEF. Additional compensatory plantation over 150 ha. degraded forest was also directed.
2. The areas will be surveyed, demarcated and **declared protected forests and placed under the control of the Forest Department** for compensatory plantation at the cost of the project. Areas not found suitable will be substituted by suitable area.
3. Forest clearance was to be done only upto 4 M below FRL.

District	Area in hectares diverted for ISP	CA target in Degraded Forest	CA target in non forest area	Total target in ha.
Khandwa	33,383	30,572	2,314	32886
Dewas	4,528	17,491	802	18293
Hoshangabad	3,678	22,739	2,842	25581
Sehore		-	1,247	1,247
Dhar		-	1,001	1,001
Khargone		-	1,937	1,937
Total	41,589	70,802	10,143	80,945
Revised Targets		70,952*	10,452**	

\* Targets revised due to additional works over 150 ha area as penalty.

\*\* Targets revised due to release of additional 308.47 ha of land.

**Progress of implementation****Physical target**

The progress reported by GoMP as on date an area of 78,643 ha (forest area = 68,596 & Non forest area = 10,047 ha) was planted up. However, after deleting the targets covered under CAT programmes balance target works out as 6,943 ha. As per stipulations, these areas were required to be planted before impoundment. Progress is awaited.

**Assessment of Success**

Progress on assessment of the success of plantations giving survival percentage, year of count with species wise details along-with progress on declaring plantation areas on revenue land as forest land under Forest Act of 1927 may please be presented, for review by the members.

**(c) COMMAND AREA DEVELOPMENT**

The project on completion will provide annual irrigation to 1.69 lakh ha. The Command area comprises Forest: 10,055 ha; Grasses and pastures: 10,498ha; Cultivated land: 142,406ha; Culturable fallow : 8,116 ha; Barren:18,385 ha. As per direction of the Planning Commission, project proposals are required to include the command area development plan also. MoEF clearance of 1987 also required it. The forest clearance stipulated that tree planting should also be done on either side of canal road and foreshore of the reservoir and in the wasteland / vacant lands under the control of the Irrigation Department in the command area. The key conditions attached with the investment clearance were as follows.

- The State shall comply with the conditions as laid down in the O.M.No.3-87/80-IA dated 24.6.1987 and letter No.8/646/84-FC dated 7.10.1987 both issued by the Ministry of Environment and Forest while according the environmental clearance and the approval for diversion of forest lands for this project respectively for this project and ensure completion of Rehabilitation and Resettlement Plan in scheduled time with close monitoring as per requirements of Department of Environment and Forest.
- State will establish adequate network for ground water monitoring in the command within 2 years and the State should submit to Planning Commission the time frame for establishing such network with mile-stone achievements, duly vetted through Central Water Commission, for monitoring the same by Planning Commission
- State should draw up a detailed time schedule for completion within 5 years the investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area ( which is not already submitted to the Planning Commission at the time of seeking approval ) of the total command of this project.
- The State should draw up an implementation schedule segment-wise for completion of canal network, in such a manner that a segment of the canal network, taken up from head reaches, is completed in all respect so as to make the irrigation water available, for the design potential of that segment upto the outlet in that particular segment;

**Progress of Implementation :****Studies under Progress**

The study on impact of Agro chemicals, runoff from fields on surface & ground water quality in the command area was assigned to J.L. Agricultural University, Jabalpur. Results may please be presented

**Preparation EIA report and EMP for CAD areas**

As informed by the NVDA a GIS based CAD plan was under preparation with the help of NIC, MAPCOST and Survey of India. Preparation of a comprehensive command area development plan was entrusted to MITCON consultants of Pune at estimated cost of about Rs.40.00 lacs. A multi-disciplinary expert group was constituted by the GoMP to supervise and monitor the preparation of this plan. It was reported that work related to digitization being carried out by NIC with the help of MAPCOST, Survey of India, National Bureau of Soil Science was completed and Coordination/ Development of GIS based plan by NIC was in advance stage. Construction works on the dam have already been completed. However, delay in Command Area Development works is contributing to gaps in irrigation potential created and utilized. Further progress may please be presented, for review by the Members

#### (d) FLORA, FAUNA & CARRYING CAPACITY

The Guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora and fauna present can be assessed, listed (rare and endangered) species can be detected, if present and appropriate conservation measures devised before commencement of the impoundment. Implementation of the recommendations contained in the EIA studies carried out by the agencies engaged by Madhya Pradesh on advice of the Environment Sub-Group were required to be implemented in time.

The objective of the suggested studies was to assess the environmental impacts as a result of the Narmada Sagar Complex, consisting of the three dams: the Narmada Sagar, Omkareshwar and Maheshwar to ensure minimal adverse effects on wildlife as a result of the project development works. Studies were entrusted to Wildlife Institute of India, Deheradun, Friends of Nature Society, Bhopal & limnological studies to the Universities (Jabalpur, Ujjain & Bhopal). These institutes carried out studies with a view to address the above concerns and recommended certain mitigation measures, which included the following.

1. Key aquatic vertebrates species like **otter** was proposed to be restored and translocated. It was suggested to explore the possibility of capturing and translocation of impacted otters of Narmada Sagar into identified localities of the vacant niches in central Indian rivers.
2. Besides, a species restoration plan for **aquatic reptile (turtle)** was also suggested within the submergence zone and also in other stretches of the river with rocky structure and sandy banks.
3. The restoration program for **muggar crocodile** as being practised in other districts of M.P. was also suggested.
4. The studies of certain aspects of fisheries and reservoir sciences have been included in the Limnological studies being conducted by the three Universities of the State.
5. Since the topography in the reservoir area consists of rolling hills, the higher peaks to remain above the water surface level and constitute islands in the reservoir. In addition to these small islands, two large islands will be formed to the north and south of the Narmada River just upstream of the Indira Sagar Dam. These islands were required to be protected. Key recommendations requiring implementation before commencement of impoundment included the following:
  - Felling of trees from the submergence area in sequential manner to avoid trapping.
  - Declaration of hillocks which remain above the submergence as Wildlife refuge areas.
  - Protection for the wildlife moving out from the submergence area & rehabilitation measures for Wildlife as per recommendation the study groups focusing on National Park / Sanctuaries for ISP and
  - fisheries conservation and development :

**Felling of trees** A plan for felling required to ensure protection to wildlife remained awaited, however GoMP reported that felling was under progress in 300 compartments of forest areas, 407 Khasra from 24 villages besides private areas of 125 villages. It was further reported that by the end of March 2007, felling was completed upto 4 meter below the FRL. Environmental consequences of this large scale felling were documented to by the wildlife Institute of India in the EIA studies, which called for implementation of mitigation measures, commensurate with progressive filling of the reservoir. This remained awaited

## **Rehabilitation of Wildlife**

### **Terrestrial Environment**

WII based on scientific studies of the impact area to mitigate the losses recommended in their report of 1994, new protected areas namely Narmada National Park, Suryanmaya Sanctuary and Omkareshwar Sanctuary. The recommendation included protection to Khari river on the north bank and to the Narmada river in immediate downstream of the Indira Sagar Project.

Govt. of Madhya Pradesh however, instituted parallel studies and subsequently proposed to notify areas reduced in extent and distinct in location, from the ones recommended by the WII. Wildlife institute expressed concern and conveyed that it would adversely affect the protection measures. Implementation of the recommendation continued to be under consideration of the Govt. of Madhya Pradesh for the last 14 years or so.

Environment Sub-Group during its 42<sup>nd</sup> meeting suggested that issue should be resolved taking in to consideration the views of the Wildlife Institute of India. The sub-group also directed that undisputed areas should be notified at the earliest. It was reported by the NVDA that pending creation of parks/sanctuaries, skeletal staff has been put in place and expenditure is being incurred on procurement of equipments. GoMP promised to notify areas within 6 months time which is already over 5 years back. A meeting to resolve the issues was arranged by NCA on 22<sup>nd</sup> Jan 2008 wherein the issues were discussed with team from Wildlife Institute of India and representative of the MoEF. The WII agreed to examine the proposal of Government of Madhya Pradesh, if details could be made available and to make appropriate recommendations in this regard.

### **Aquatic Environment**

NVDA desired carrying commercial fishing activities on the areas delineated by the WII Dehradun for declaring National Park & Sanctuaries. The issue was discussed by the sub-group and it was observed that the area proposed for fisheries development included reserve forest area, and therefore, required de-notification. The issue was considered outside the jurisdiction of the sub-group and GoMP was advised to approach concerned division of Ministry of Environment and Forests. Dam was already filled to EL 260m, but the required plans were not yet in place. It was reported that Madhya Pradesh is practicing fisheries in the ISP reservoir through MP Matsya Maha Sangh.

Factual position with regards to requisite permissions and Status of implementation of needed environmental Safeguard Measures may please be presented for review by the Members.



### (e) Seismicity and Rim stability

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. The Narmada Sagar reservoir has a gross capacity of 12,200 million cubic meters, or about 9.9 million acre-feet, by far the largest-capacity reservoir planned in the Narmada River basin. Therefore, the issues of Seismicity and the potential for reservoir-induced seismicity (RIS) were required to be attended as per recommendation of the Dam Safety Review panel, Central Water and Power Research Station, (CWPRS) Pune and Indian Meteorological department (IMD), which suggested: to monitor seismicity during the pre and post-impoundment phases. Network of about five stations each be developed in the Narmada Sagar, Omkareshwar, and Maheshwar areas .

- To record the ground motion intensity and response of the dams for any significant earthquake in the vicinity, installation of three strong motion seismographs at each dam site.
- To record any significant ground motion that occurs during construction, one strong motion instrument near each dam site.

Accordingly, a network of 10 seismological observatories with sophisticated instruments was recommended. It was proposed to monitor pre and post impoundment seismicity also at these seismic stations to help in assessing the adequacy of seismic parameters adopted for designs. The complete package of seismic digital and analog recorders and sensors have been procured and installed at 10 observatories stations. Man power has been deployed for day-to-day operations, maintenance and watch & ward of seismic observatories of ISP on contract basis. It was informed that data was being recorded at all the observatories except at Kannod and IMD has taken over monitoring of station located at dam site for acquisition of data and its analysis.

During the last meeting, the Chairman directed that proper arrangements should be made for analyzing the collected data by professional identified Institutes through proper terms of references on regular basis, so that, in case, it is observed that progressive filling of the reservoir aggravates the situation, corrective steps can be taken. University of Roorkee / IMD were suggested by the Sub\_group for the purpose. Progress is awaited

Members may like to discuss and review.

**(f) Health Aspects**

Surveys and investigation of the existing levels of health, information on specific diseases besides implementation of the planned measures in time were required in accordance with the order of clearance. Three specific diseases namely Malaria, Schistosomiasis and Filariasis were studied and diseases like leishmaniasis, scabies, etc., were investigated. The geographical reconnaissance study to identify the potential breeding sites of malaria vector, was suggested. Other key suggestions included

1. Measures to control schistosomiasis should include physical, chemical, and biological means. The biological mitigation measures would include the use of predator species that would eat the secondary host snails.
2. Since the Anopheline mosquito vector has the potential to proliferate in the reservoir, the large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Some experimental resistance of adult mosquitoes to commonly used biocides was noted under laboratory conditions. Thus research to maintain effective biocides was to be continued on long term basis. Land leveling and land filling operations as well as appropriate vegetation clearing were to be integrated. Control measures was to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites.

In pursuance, the NVDA was required to update and implement the plan on health aspect for ISP. A copy of the plan was received from the NVDA. It covered the up-stream, dam site, command area and the rehabilitation sites of the Indira Sagar and Omkareshwar projects. The plan estimated to cost Rs.6.49 crores included provisions towards ISP for 30 bedded hospital at Punasa, 1 mobile unit, 29 Sub-Health Centers, 2 Public Health Centers besides strengthening of 6 existing health sub-centers. Provisions for IEC, control of Arthropods, provision of insecticides and surveillance were also incorporated.

Observations of the ICMR on the health plan identified certain gaps in plan. During 43<sup>rd</sup> meeting it was brought out that during the last verification during 2001 by experts, deficiencies were observed in implementation of needed safeguards. Further progress is awaited

Status of compliance / implementation of the plan may please be presented, for perusal / observations and review by the members.

**(g) Archaeology**

In addition the general obligations of the State under the provisions of the 1958 Act State Govt was to protect Type-I, II and III monuments, according to the directions received from the MoEF. The action plan was required to cover the issues on archaeology and anthropology

According to the plan prepared by the Archaeological Survey of India, a well situated in the midst of north bastion of Joga Fort, a centrally protected monument of Type-I, will be fully submerged at FRL + 262.10 M. NHDC has taken steps to protect it as per advice of the ASI.

Investigations of the basin have revealed that valley was rich in archaeological belongings. A survey of the 254 villages for identification of the archaeological monuments falling within the submergence area was carried out by the State Department of Archaeology and Museum, Bhopal.

Simultaneous survey of 167 villages was completed earlier by the ASI but further progress on completion of survey for the remaining villages was awaited. During the last meeting, Member (E&F), NVDA assured the Sub Group to examine the issue and report back to the Sub Group.

Progress may please be presented by the NVDA

**(h) Anthropology**

The Narmada Valley can be divided into three physiographic units (1) Western Vindhyas (2) Narmada through West and South and (3) Western Satpuras. Some Indologists place the Narmada-Chambal civilisation of Malwa as a contemporary of Indus civilisation. Navada Toli is a site contemporary to Harappa where evidence of early farming villages were discovered. Findings of a hominoid skull from Hathnora indicated the possibilities of the existence of human bio-cultural remains within the basin. It was informed by the anthropological Survey of India that Narmada Valley Civilisation is very old and is comparable to pigmies of the Sough Africa. Therefore, it was imperative that required studies should be carried out in the valley before submergence. Anthropological Survey of India was requested to speedup their studies on Narmada to complete the same before submergence. Progress may please be presented by the Anthropological Survey of India.

NVDA has also planned to establish a Center on Religious and Cultural heritage of the Narmada Basin. Progress may please be presented. NVDA prepared a plan for excavation of five sites in Districts Dewas & Khandwa. As per the information received from the NVDA, excavation works on all the five identified mounds have been completed.

A report on findings of the excavations may please be presented for a review by the Members

**(i) Environmental Management of Downstream Areas :**

For Management of downstream areas especially with reference to requirement of environmental control focusing on aquatic eco-system, health hazards, quality of water & its suitability for designated uses, a Disaster Management Plan was required. The Environment Sub-group during its 38<sup>th</sup> meeting also suggested adequate safeguards for the downstream environment. In response a copy of the disaster management plan was received. The plan is being examined.

During the last meeting a detailed presentation on the mechanism in place to ensure quality & quantity of releases w.r.t implementation of required environmental safeguard measures was assured by the NVDA/ NHDC for a review by the members.

**Item No. XLV-3(207): SARDAR SAROVAR PROJECT :**

**A) PRESENTATION OF THE REPORT OF THE COMMITTEE ON FIELD VISIT TO THE AREAS IN MADHYA PRADESH, GUJARAT & MAHARASHTRA.**

During 42<sup>nd</sup> meeting held on 7<sup>th</sup> April 2005, Sub-Group directed field verification of the works under taken by the Project authorities on implementation of Environmental Safeguard Measures. In pursuance field visits were undertaken to the ISP & SSP areas in Madhya Pradesh & Gujarat areas earlier and field visit to the SSP areas in Maharashtra was undertaken in January 2008. Copies of the report of the committee have already been circulated to the members separately. Key recommendation are placed at **Annex-XLV-4** for a review by the members.

**(B) REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES****(a) CATCHMENT AREA TREATMENT****❖ Phase-I.**

- i) **Physical Targets :** Project authorities were required to prepare plans for treating those critically degraded sub-watersheds which were identified as directly draining into the reservoir. The implementation of the plan was to be pari-passu with the construction of the dam.

Out of total Catchment of 24,45,163 ha, 28.4% was found critically degraded. Of the total catchment, 6.66% was to be treated under phase-I and balance area is proposed to be treated under Phase-II. Physical target were nearly achieved.

- ii) **Assessment of Efficacy :** To assess the success or failure of the CAT measures implemented for ensuring that structures were maintained and remained functional Sub-Group suggested use of aerial photography / Remote sensing for assessment of the success rate of CAT works in forest areas besides establishment of silt monitoring stations for the non forest areas. Progress on assessment work is presented in the table below:

S.No.	States	Forest cover assessment	Silt monitoring
1.	Govt. of M.P.	Awaited	Awaited
2.	Govt. of Gujarat	Updation of Report awaited.	Report awaited.
3.	Govt. of Maharashtra	Report received revealed decrease in forest cover.	Two stations established, Interim report received.

**❖ Phase-II**

1. **Physical Targets:** The balance sub-watersheds were to be treated under programme for implementation in a time frame to be determined separately by the project authorities in consultation with the Ministry of Environment & Forests. It was ruled by the Chairperson, Environment Sub-group of NCA & Secretary, MoEF that these areas should be treated within 5 to 6 years time.

All figures in ha	Targets (Treatable areas )	Achievements	Total
Gujarat	500	500	Completed
Madhya Pradesh	318118	35312	Unlikely to be completed due to lack of funds and manpower
Maharashtra	54707	29043	Possibly can be completed in 5-6 years time

Further progress if any may please be presented by the party states for a review by the members. .

## Item No. XLV-3(207): (b) COMPENSATORY PLANTATION :

## QUANTITATIVE.

- o It was informed by the Party States that the physical works on the available areas have been completed. The balance areas shall be taken up soon.

States	Physical : Targets (ha.)	Physical : Achievement (ha.)	Balance areas (ha.)
Madhya Pradesh	8,737	8,737	00
Maharashtra	19466	19,378	88
Gujarat	13,950	13,950	00
<b>Total:</b>	<b>42,153</b>	<b>42,065</b>	<b>88</b>

## QUALITATIVE

In terms of the order of clearanc, the non forest areas planted up by the project authorities are required to be handed over to the regular territorial forest divisions for regular upkeep & maintenance and till such time these were to be handed over to the regular department, plantations were required to be maintained with watch & ward as per the planned programme. Besides, survival count, species composition, year of count and the areas under each category was required. The progress is presented below:

States	Progress.
Madhya Pradesh	80% non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage and crop composition awaited..
Maharashtra	<i>About 80% of non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage was reported to be 41% and at several places percentage is below acceptable level.</i>
Gujarat	96% non-forest area is covered under section-4 of the Forest Act of 1927. Assessment of survival percentage and crop composition awaited..

Members may like to discuss & review.

**Item No. XLV-3(207): (c) COMMAND AREA DEVELOPMENT**

The command area of the project has been fixed on the basis of areas included by NWDT for purposes of considering requirement of Narmada water for irrigation. Stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India required series of actions to be taken on the field before commencement of irrigation. Key requirement is indicated in the **Annex – XLV- 5**.

**GOVT OF GUJARAT**

During 41<sup>st</sup> meeting of the Environment Sub-group, it was assured by the Govt. of Gujarat that micro-plan for about 44000 ha area proposed to be irrigated during Phase-I shall be submitted soon and that all required environmental safeguard would be implemented before commencement of the irrigation.

1. A copy of the micro-plan for development for CCA of 41,305 ha under Phase-I of the command was received during last week of December 2005. It was reported by the Govt. of Gujarat that an area of 2.5 lacs ha. have already been brought under irrigation. The Environmental Management Plan for 2.5 lacs ha. area brought under irrigation is yet awaited.
2. During the 43<sup>rd</sup> meeting, GoG promised to submit the revised plan by the end of March 2007. The plan was submitted during 44<sup>th</sup> meeting of the Environment Sub-Group held on 16<sup>th</sup> July 2007. Discussions on the same led to the formation of Committee of expert. The committee reviewed the Command Area planning & implementation and held discussions with the concerned officers of the State of Gujarat and suggested means for moving forward. Report of the Committee is circulated to all members for their observations. Govt. of Gujarat assured submission of revised plan by the end of January, 2008. The committee reviewed the progress on preparation of plan & diagnostic analysis studies being undertaken by Govt. of Gujarat during field visit undertaken from 12<sup>th</sup> to 13<sup>th</sup> Feb. 2008. It was observed that diagnostic analysis are initialized and preparation of plan is being firmed up. Further progress shall be presented by the Govt. of Gujarat during the meeting.

Members may like to discuss & review.

**Govt. of Rajasthan**

In Rajasthan for 2.3 lakh ha. of GCA, Command Area Development Plan was required to be prepared and implemented commensurate with the development of irrigation in the command area. Command area macro plan for the areas in Rajasthan was received and discussed during the 43<sup>rd</sup> meeting. It was directed by the Sub-Group that the issues raised should be resolved as it emerged from the discussions that the plans submitted by the Govt. of Rajasthan, if implemented without extensive revision, would convert the command area in Rajasthan to a saline desert besides impacting environment adversely. In pursuance, a meeting to discuss Management Plan for Command Area Development Works of Narmada Canal Areas in Rajasthan, was held at 11.00 A.M. on 16<sup>th</sup> March, 2007 amongst the officials/ experts of Central and State government from Narmada Control Authority, State Govt of Rajasthan and Central Arid Zone Research Institute and it was agreed as under :

- ♦ Govt. of Rajasthan to prepare & present a micro-plan for the areas proposed to be brought under irrigation. utilizing the expertise with CAZRI, considering the status of construction of the canal network. This plan shall be put up for consideration of the



Sub-Group in advance of commencing irrigation in the area. Further discussions were held with officials of the Govt. of Gujarat, MoEF, WII & NCA and EIA studies were called for. Subsequently through series of discussions, ToR drafted by the NCA were made available to the Govt. of Rajasthan. It was reported that Govt. of Rajasthan has approved ToR for EIA studies on Biological resources of the Command through Wildlife Institute of India & EIA on other issues is under approval. It was also agreed that a field visit shall be arranged during March, 2008 to the areas in Rajasthan, where irrigation is likely to commence soon.

Further progress may please be informed by the Govt. of Rajasthan for a review by the Members.

Item No. XLV-3(207): (d) **FLORA, FAUNA & CARRYING CAPACITY**

The guidelines of the MOEF required that while seeking environmental clearance for the hydropower projects, surveys should be conducted so that the status of the flora and fauna present can be assessed, listed (rare and endangered) species can be detected, if present, and appropriate conservation measures devised before commencement of the submergence.

Implementation of the recommendations contained in the EIA studies carried out by the agencies engaged by the Gujarat, Maharashtra & Madhya Pradesh were required to be implemented in time.

**Govt. of Maharashtra :**

EIA reports indicated presence of rare, endangered and threatened species of wildlife calling special measures for their conservation. State Govts. proposed amongst others two critical restorative measures as brought out below :

1. Buffer zone plantations for rehabilitation of wildlife moving out from the submergence area.
2. Management of corridors for shifting of wildlife, several corridors, passing through moderate to good (0>3) vegetation cover.
3. Studies on development of neo ecosystem

These measures were required to be taken before commencement of submergence in terms of the order of clearance and direction of the Sub-group. As reported by Govt. of Maharashtra buffer zone plantations are making satisfactory progress where as progress on other recommendations on the studies group are awaited.

Members may like to review.

**Govt. of Gujarat :**

M.S. University, Vadodara conducted EIA & recommended several measures for preparation of Environmental Management plan for the upstream environment. Key recommendations focused amongst others on the following issues.

- Rehabilitation plan for the identified animals and plants.
- Recommendations of the M.S. University, focusing on activities of the joint forest management committees and specific recommendations for the protection and conservation of *Butea monosperma* (yellow variant) and *Radernachera xylocarpa* which were unique and represented important and rare floral element
- To undertake development programme in rural areas in natural watershed unit.
- Training the manpower for necessary industrial skills and establishing interactive relationships among different units of the state.
- An independent monitoring and evaluating infrastructure for successful execution of these strategies and action plans.
- Govt. of Gujarat reported progress on development of Shoolpaneshwar Wildlife Sanctuary. A detailed report on development works under implementation in the Sanctuary areas and on migration of wild animals during progressive filling of the reservoir is awaited.

Further progress on other recommendations of the EIA study group is awaited. Compliance of the recommendations of the ESG Committee is awaited.

Members may like to discuss and review

#### **Govt. of Madhya Pradesh :**

State Forest Research Institute, Jabalpur carried out the EIA for the areas in Madhya Pradesh and recommended measures for drawing up of the environmental management plan.

State Govt. however proposed restorative and ameliorative safeguard measures as brought out below :

1. To cater to increase requirement of timber, fuel-wood etc., social forestry programme at an estimated cost of Rs.5.0945 crores chargeable to SSP (price level of 1999-2000) with escalation of 9% pre annum was approved by the State Wildlife Committee.
2. 60 islands which will be formed in the reservoir varying in extent from 1 ha to 75 ha should be left undisturbed for study of the process of natural succession and to provide refuge to bird life in the area.
3. Studies recommended creation of two wildlife sanctuaries namely Mathwad (34.659 sq. km.) in Jhabua district and Bokrata (35.59 sq. km.) in Khargone district.
  - a. In pursuance to the directions in the Environment Sub-group GoMP entrusted EIA studies to the Wildlife Life Institute of India. Studies have commenced and report is likely to be available shortly.
  - b. It was decided by the Sub-group that the issue of cost sharing for the proposed sanctuaries brought up by the Govt. of Madhya Pradesh could be discussed after receipt of the EIA report.

Members may like to discuss and review.

#### **Aquatic Environment :**

Impoundment in SSP commenced with the closure of construction sluices during Feb 1994. The impoundment has progressed with the attainment of height of E.L. 121.92 m. resulting in much larger water spread, requiring a number of sequential actions, in accordance with pre & post impoundment action plan suggested by the CICFRI to safeguard the aquatic environment. State Govt's are requested to present the steps taken to safeguard the aquatic environment.

#### **Felling of the Trees in the submergence area**

Plans for felling of trees in the forest area coming under submergence to avoid the possibility of animals being trapped in the submergence area, prevention of Eutrophication, degradation of water quality, proliferation of disease vectors etc., were required for the areas in Gujarat, Maharashtra & Madhya Pradesh. Forest areas were required to be taken up for felling in a systematic manner to avoid any possibility of the same.

#### **Madhya Pradesh**

Felling in entire forest area coming under submergence is reported to have been completed. Detailed report is awaited.

#### **Govt. of Gujarat**

In Gujarat, the forest area diverted was 4165.91 ha in addition 356.78 ha was diverted earlier. Thus in all 4522.69 ha was utilized for the SSP. Of this 4152.68 ha of the Distt. Vadodara and Bharuch required felling. The felling in Gujarat was reported to be

completed about a decade ago. However pole crop has come up again and required felling. It was observed by the Committee of the ESG that corresponding to 121.92 E.L. about 30% of the area only could be felled and balance 70% felling is awaited. It was reported by Govt. of Gujarat during 43<sup>rd</sup> meeting of the Environment Sub-group that entire coppice crop was also removed. Detailed report is awaited.

**Govt. of Maharashtra**

In Maharashtra the forest area of 6,488 ha was diverted for submergence out of which 3,157.03 ha was forest. The balance area was under river bed, nallah etc., it was reported by Govt. of Maharashtra that except for 27 ha area in Maharashtra, felling operations have been completed. A detailed report was awaited.

Members may like to discuss and review.

## Item No. XLV-3(207): (e) SEISMICITY AND RIM STABILITY

The clearance order issued by the MoEF in 1987 identified Seismicity as one of the parameter. Dam design in India is regulated by a national standard developed by the Bureau of Indian Standards (BIS). The BIS has classified the Indian sub-continent into 4 zones depending on tectonic, geologic and seismic consideration using available data. The River Narmada lies in the seismo-tectonic provinces of Cambay Basin and Peninsular Shield (including the Deccan Trap) and comes under Zone 3 of the BIS classification.

**Rim stability** refers to the competency of reservoir base rocks to maintain natural slopes and to contain the stored water. Under stable conditions, there should be no significant losses of reservoir water due to ground water percolation or seepage. Where rocks are found to be highly permeable, mitigative measures are needed to ensure the longevity of the reservoir.

The GOG appointed a Dam Review Panel, comprising engineers and geologists, to evaluate the report and findings and a revised final report was submitted to the project authorities in 1982. The main mitigation measures suggested were as follows :

- Construction of dams and Infrastructure (Incorporating seismic design coefficients) to withstand the maximum credible earthquake
- Establishment of seismic monitoring stations at key locations around the reservoir

Status of Implementation of the mitigatory measures is summarised in the table below:-

ACTION	STATUS
Dam design modifications : <ul style="list-style-type: none"> <li>▪ Adoption of horizontal design coefficient of 0.125g on the recommendation of the Dam Review Panel / National Committee on Seismic Design Parameters for River Valley Projects.</li> <li>▪ Installation of stress monitors in the main body of the dam</li> </ul>	Completed
▪ GSI (Nagpur Division) Rim Stability studies	Completed
▪ Tracer Studies by CWPRS	Completed
▪ Monitoring stations	Rim stability studies have been completed and well equipped 9 monitoring stations along the periphery of the reservoir, 4 each on either side and one at the downstream of the Sardar Sarovar reservoir. Out of a total of 9 stations, 3 are in M.P. (Alirajpur, Kukshi and Badwani, 1 in Maharashtra (Shahada) and 5 in Gujarat (Kawant, Naswadi, Kevadia, Jitgaon )
▪ Results of analysis of data from monitoring stations.	Received, analysed by the dam safety review panel of the SSP during October, 2001. Up-dation of the data is awaited.

Regarding up-gradation of network, the technical specifications were being worked out in consultation with IMD. The up-gradation was likely to cost about Rs.5.50 crores. GoG had planned to invite tenders by August, 2004 for the same work. The work was to be completed by September, 2005. Progress from Gujarat is yet awaited.

It was reported during 40<sup>th</sup> meeting that Seismic activity at the dam site and around the periphery was being studied by a team of experts. The data was being analysed and annual seismological bulletins were being published. GoG had requested the Director General, Indian Seismological Research Institute (ISRI), for the evaluation of the Seismic data obtained by the SSNNL.

Further progress may please be reported by the GoG for a review by the members .

**Item No. XLV-3(207): (f) HEALTH ASPECTS**

In addition to the general obligations of the State under National policy, a specific requirement for the SSP contained in the environment clearance order of GOI was that the plans for the provision of health facilities to workers and residents of the affected areas should be prepared. Each State should take necessary measures to minimise the risk of malaria, filarial, schistosomiasis and other diseases associated with water that may result from implementation of the project. Preparation of an Action Plan for the surveillance and control of malaria was also stipulated. As per the further directions received from the MoEF in 1987, the states were required to take up measures given in the following table.

Sl. No.	Mitigation measures	Gujarat	Maharashtra	Madhya Pradesh
1.	Present status of the waterborne disease in the areas	Pre-impoundment data is available.		
2.	Screening arrangements for workers at the project site proposed for the work force;	Completed	Not relevant	Not relevant
3.	Epidemiological Surveillance studies	Completed by SCHMS	Report on disease pattern of Nandurbar District received, but not as per requirement.	Completed by GMC, Bhopal.
4.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases	Action plan under implementation	Revised Action plan received and is under scrutiny	Action plan revised on Aug. 2003
5.	Reinforcement proposed to the existing health delivery system commensurate with progress of construction work.	Completed	Incomplete	Incomplete
6.	Surveillance of diseases	Progressing	Continued to be weak	Surveillance is weak. Reports not received.
7.	Standard formats available with the NICD to be used for diseases surveillance purpose.	Awaited	Awaited	Awaited
8.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	Progressing	Progressing	Awaited
9.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.	Progressing	Awaited	Awaited
10.	Regular Entomological monitoring is suggested for alterations in ecology of the area due to irrigation / impoundment.	Progressing with the help of ICMR.	Awaited,	Awaited
11.	It is suggested that sanitary latrines be established at the R&R sites and  Villagers may be educated to use these to keep the cases of Gastro diseases in check.	Progressing	Awaited  Health Department is performing IEC activities to educate the people.	Awaited

12	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited	Awaited	Awaited
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The status of compliance of requirement may be discussed and reviewed by the Sub-group.



**Item No. XLV-3(207): (g) ARCHAEOLOGY & ANTHROPOLOGY**

In addition to the general obligation of the States under the provisions of the 1958 Act for protection of Type-I, II and III monuments, according to the directions received from the MoEF, the action plan was to cover the issues on archaeology and anthropology as brought out below.

- 1) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- 2) Plan for rehabilitation of monuments wherever necessary.

The current status of the protection / relocation works is presented below :

		Gujarat	Maharashtra	Madhya Pradesh
Monuments	FRL	2 ( 2 completed)	Nil	Completed
	Commensurate with EL 121.92 m			NVDA assured that no approach shall be impacted
Mounds	FRL	Nil	Nil	Completed
	Commensurate with EL 121.92 m			NVDA assured that not likely to be impacted
Museums/ Park	FRL	N.A.	N.A.	4 ( 1 completed)
	Commensurate with EL 121.92 m	N.A.	N.A.	Not relevant

Further progress may be informed to the Sub-group.

**Item No. XLV-3(207): (h) ENVIRONMENT MANAGEMENT OF DOWN STREAM AREAS**

Govt. of Gujarat accepted recommendations of HR Wallingford & informed to Sub-group to implement the measures suggested therein. The key mitigatory measures suggested are presented below :

- ▶ Provisions for complimentary flows for mitigating pollutions in the downstream, restoration and sustainable development of mangrove and forest vegetation on Aliabet and Tawara Islands, addressing of the Socio-Economics of the fisheries development downstream zone,
- ▶ Operational procedures for dam to facilitate survival of downstream biota, adequate monitoring of water quality including physical, chemical and biological parameters,
- ▶ Developing of mathematical modelling for prediction of likely impacts of different operational scenarios for mitigation, studies on ecology and resources for the downstream environment, narrowing of river channel,
- ▶ Legal agreement between the Party States for regulated releases to ensure that project works as planned.
- ▶ In addition it was also suggested that releases downstream may also have to be diluted for keeping the surface as well as ground water in good condition.

However progress on preparation of the Environmental Management Plan for Management of Downstream areas, in accordance with recommendation with time frame budget and implementation schedule is awaited.

On the recommendation of Environment Sub Group Gujarat entrusted ecological studies for the D/S areas, the report of this study is awaited. M/s H.R. Wallingford appointed by GOG for EIA/EMP of D/S areas of SSP in their report recommended release of 1500 Cusec towards environmental requirement. However, on the submission of Government of Gujarat, a release of 600 cusec of water towards compensatory flow was agreed by the Sub Group, which is being ensured by Sardar Sarovar Reservoir Regulation Committee. Report on modified ecological regime in downstream area may be presented by Gujarat.

Members may like to review.

**Item No. XLIV-4(208): LEGAL ISSUES ARISING OUT OF AN APPLICATION FILED BY SNEH.**

An application has been filed before the Central Empowered Committee Constituted by Supreme Court of India in W.P. No. 202 of 1995 by Shri Dinesh Kothari, President, Society for Nature Education & Habitats. The main prayer is as follows :

- i. Direct declaration of protected area as per the recommendation of the Wildlife Institute of India i.e. Sanctuary Narmada National Park (496.70 km<sup>2</sup>), Surmánya Sanctuary (126.67 km<sup>2</sup>) and Omkareshwar Sanctuary (119.96 km<sup>2</sup>) comprising of a total area of 788.57 km<sup>2</sup>.
- ii. Diversion of forest area by letter dated 19.08.2004 be declared illegal.
- iii. Direct to conduct fresh Environment Impact Study of the area for suggesting mitigating measures.
- iv. Direct to stop all the tree felling under the working plans & collection of minor forest produce; tendu patta collection etc. From the PA's as proposed by WII till the disposal of this application.
- v. Pass any such other or further order, as this Hon'ble Committee may deem fit and proper in the facts and circumstances of the case.
- vi. Pass any such other or further order, as this Hon'ble Committee may deem fit and proper in the facts and circumstances of the case.

During the course of hearing on 3<sup>rd</sup> December 2007, Centrally Empowered Committee suggested that the issue may be resolved within the frame work of NCA. Accordingly, a meeting was arranged by NCA on 22<sup>nd</sup> January 2008, wherein the issues were discussed with WII & MoEF officers. Minutes of the meeting have already been circulated.

Members may like to discuss and decide further course of action.

**Item No. XLIV-5(209) : SHARING THE COST OF THE TREATMENT OF FREELY DRAINING CRITICALLY ERODED CATCHMENT AREA**

It was reported during 44<sup>th</sup> meeting that a separate meeting was convened by the Chairperson of the Environment Sub-group & Secretary, Ministry of Environment & Forests on 9<sup>th</sup> July, 2007, wherein it was ruled that

1. The cost of treating both Phase-I & Phase-II areas should be chargeable to the project and that Phase-II areas should be treated within 5 to 6 years time. The recommendations of the Sub-group shall be put-up to the NCA for further deliberations.

Govt. of Gujarat, however, vide their letter at **Annex-XLV-3**, requested that the issue of charging the cost of both Phase-I & Phase-II may not be treated as final

2. To discuss and decide the formula for cost sharing amongst the party States a meeting is being arranged soon. Outcome shall be reported in due course.

This is for information of the Sub-group.

**Item No. XLV - 6 (210) : REVIEW OF THE ACTION TAKEN ON THE DECISION OF THE PREVIOUS MEETINGS.**

**a) MONITORING WORKS IN MAHARASHTRA**

**Agency for Inter Departmental Coordination for effective implementation of the plans in time and funding of the works on implementation of action plans for mitigation of adverse impacts on environment.**

In pursuance to the recommendations of the Environment Sub-group during 40<sup>th</sup> meeting, a series of steps were taken by the Govt. of Maharashtra and Environmental Cell for strengthening Inter Departmental Coordination has been formed. Progress on appointment of Staff, provision of funds, a report on activities of this cell and expenditure incurred thereon may please be presented by the Government of Maharashtra

**b) SARDAR SAROVAR PROJECT : PUBLICATIONS / SEMINARS ENVIRONMENT MANAGEMENT**

During earlier meetings, it was desired that good works being done by the Project Authorities are to be published and Seminars should also be organised. Publication brought out by the project authorities were presented and it was informed earlier that the thrust areas have been identified for publishing success stories. Further progress may please be presented by Gujarat, Madhya Pradesh and Maharashtra.

**c) COST ESTIMATES FOR PREPARATION OF ACTION PLANS AND IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARD MEASURES**

In order to frame yard sticks on the cost estimates of the water resources Projects, the Chairman of the Sub-group during desired compilation of the estimates and expenditure incurred on survey, studies and implementation of the suggested safeguard measures for the SSP / ISP. Updating of the estimate and expenditure on environmental components of the Sardar Sarovar and Indira Sagar Project at the current price level is requested from the Govts. of Gujarat, Madhya Pradesh and Maharashtra.

**Item No. XLV-7(211): ANY OTHER ITEM.**

**DATE & VENUE OF THE NEXT MEETING :**

# ANNEXURES

(219)

**ANNEX - XLV-(1)**

**Narmada Valley Development Authority  
59, Narmada Bhawan, Arera Hills, Jail Road  
Bhopal-462011**

No. NVDA/E &amp; F Tec./2007/ 19 55

Bhopal, Date 6-10-07

To,

Member Secretary,  
Environment Sub-group,  
Narmada Control Authority,  
Narmada Sadan, Sector-B,  
Scheme No.74, Vijay Nagar,  
Indore-452010 (M.P.)

Sub :- Minutes of the 44<sup>th</sup> meeting of the Environment Sub-group.

Ref :- No.Env-3(44)/2007/3027-66, dated 26.9.07

Sir,

This has reference to the minutes recorded for Madhya Pradesh under following items.

Item No.XLIV-2(206): REVIEW OF THE STATUS OF ENVIRONMENT  
SAFEGUARD MEASURES- PRESENTATION OF THE  
REPORT OF THE COMMITTEE.

And

Item No.XLIV-3(207): REVIEW OF IMPLEMENTATION OF THE  
ENVIRONMENT SAFEGUARD MEASURES OF  
SARDAR SAROVAR PROJECT: COMMENSURATE  
WITH PROGRESSIVE FILLING OF THE RESERVOIR

**Sardar Sarovar Project****2.Compensatory Plantation**

Minutes recorded as (1)	Minutes should have been recorded as (2)
"Member (Environment & Forest), NVDA stated that as the areas treated were already handed over to the respective owners therefore, it was not possible to revisit the areas for any maintenance work. Farmers carry out maintenance work on their field at their own. Regarding quality of compensatory plantation work it was informed by him that average survival was 41% but considering that the exercise of assessment would be prohibitively costly and time consuming there was no need for any kind of assessment....."	"Member (Environment & Forest), NVDA stated that as the areas treated were already handed over to the State Forest Department after undertaking maintenance for the period prescribed in the action plan approved by GoI, MoE&F. The State Forest Department is taking care of these areas. Regarding quality of compensatory plantation work it was informed by him that average survival was 41% but considering that the exercise of assessment would be prohibitively costly and time consuming there was no need for such assessment....."



-12/-

However it may be further stated that the contents recorded in the first two sentences under column (1) above pertains to the statement made by the Member (E & F), NVDA regarding to the works/measures executed for the treatment of the catchment area.

Item No.XLIV-6(210): **SHARING THE COST OF THE TREATMENT OF  
FREELY DRAINING CRITICALLY ERODED  
CATCHMENT AREA**

Following decision has been conveyed under this item

".....After detailed deliberations, it was decided to undertake both Phase-1 and 11 CAT works at the cost of SSP."

It may be added that discussion was held on sharing the cost of catchment area treatment in the meeting on-9<sup>th</sup> July 2007 of representatives of NCA, Party States, MoWR and Planning Commission but it remained unresolved. This is a pertinent issue for the State because the cost to be incurred in MP would be enormous that is nearly Rs. 270 crore whereas the directly draining part had already been treated at the cost of Rs. 105.915 crore only. This may please be sorted out in the forthcoming meeting.

Minutes may kindly be amended accordingly.

  
Member (Environment & Forests)  
NVDA, Bhopal  
05/07/07

**ANNEX - XLV-(2)**

कार्यालय वनमण्डलाधिकारी, इछावर क्षतिपूर्ति वनीकरण वनमंडल  
59, अरेरा हिल्स, जेलरोड, नर्मदा भवन, भोपाल (म.प्र.)

क्रमांक/पर्या. एवं वन/तक/ 2135

भोपाल दिनांक: 30-10-2007

प्रति,

डा. पवन कुमार,  
संचालक, (पर्यावरण)  
नर्मदा नियंत्रण प्राधिकरण,  
विजय नगर, इन्दौर.

विषय: नर्मदा नियंत्रण पर्यावरण उपदल की 44वीं बैठक के कार्यवृत्त के संबंध में ।

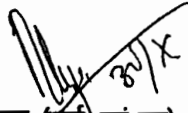
संदर्भ: न.नि.प्रा. का पत्र क्र. पर्या.-3(44)2007/3027-66 दि. 26.09.2007 ।

नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 44वीं बैठक के कार्यवृत्त में आयटम नं. XLIV-8(212) के संबंध में लेख है कि भारत सरकार कृषि मंत्रालय के प्रतिनिधि ने अध्यक्ष महोदय की उपस्थिति में केन्द्रीय बजट से Macro management योजना से 4.00 से 4.50 करोड़ की स्वीकृति हेतु सहमति दी थी, जबकि 44वीं बैठक के कार्यवृत्त में "Funding of the order of Rs. 1 to 1.5 crores p.a. matching with availability of resources and manpower at the command of the State Govt. of Madhya Pradesh" अभिलिखित है ।

अतः उपरोक्त संदर्भ के परिप्रेक्ष्य में कार्यवृत्त के पृष्ठ क्र. 116 के पैरा 3 के निम्नानुसार प्रतिस्थापन का अनुरोध है ।

"The representative of the Ministry of Agriculture stated that utilization of 100 crore per annum by Govt. of Madhya Pradesh per annum may not be feasible. He however envisaged funding of the order of Rs. 4 to 4.5 crores p.a. matching with availability of resources and manpower at the command of state Govt. of Madhya Pradesh. He also agreed to assign NVDA as a nodal agency to receive funds directly from GOI for treatment of catchment area in Narmada Basin under River valley project of macro management scheme of Govt. of India"

अतएवं प्रकरण में आगामी आवश्यक कार्यवाही किये जाने हेतु अनुरोध है ।

  
सदस्य (पर्या. एवं वन)  
न.घा.वि.प्रा., भोपाल

ANNEX - 36

**NARMADA VALLEY DEVELOPMENT AUTHORITY  
NARMADA BHAVAN, 59 ARERA HILLS, JAIL ROAD, BHOPAL**

No 2206

Bhopal dtd. 7/11/07  
-7/2007-

To.

✓ The Member Secretary,  
Environment Sub-Group (ESG),  
of Narmada Control Authority,  
Narmada Sadan, Sector-B, Scheme No.74,  
Vijaynagar,  
Indore 452010 (M.P.).

Speed post

Sub:- 44<sup>th</sup> meeting of the Environment Sub-group (ESG) held on 16.7.2007.

Sir,

In the 44<sup>th</sup> meeting of ESG held on 16.7.2007, the Chairman directed that Action Taken Reports (ATR) on all the items included in the Agenda of the 44<sup>th</sup> meeting be furnished by the States so that conclusive discussions could be held in the next meeting scheduled to be held in October 2007.

In the Agenda of the 44<sup>th</sup> meeting of ESG, eight main items (with many sub items) are included. ATRs on all the items and sub items pertaining to Madhya Pradesh are being furnished separately.

With this letter, comments on some of the sub items are enclosed to bring out the modification required in the agenda and the deliberations in the meetings of other Committees of NCA for information and necessary action by ESG.

Yours faithfully,

Encl.-1 (6 pages)

7/10/2007  
Member(E&F)  
Narmada Valley Dev. Authority

Wagh-24.7.07

1

Dir (Env)

12/11/07

PI discuss

13/11/07  
discussed across 34  
12/11/07  
acknowledged

Comments of GOMP on the Agenda items of the 44<sup>th</sup> meeting of ESG held on 16.7.2007 pertaining to (1) Seismicity and rim stability for SSP (sub item of item No. XLIV-2 (2006) on review of implementation of recommendations of ESG towards environment safe guard measures of SSP) and (2) Environment management of down stream of SSP (sub item No. XLI-3(2007), h)

(1) Seismicity and rim stability for SSP (Agenda page 4)

On this item, report is to be submitted by GOG and not by GOMP.

As pointed out in the Agenda under item No. 3(e), page 13, "rim stability studies for SSP have been completed and well equipped 9 monitoring stations have been set up along the peri-phery of the reservoir, 4 each on either side and one at the down stream of the SSP reservoir by GOG. Out of a total of 9 stations 3 are in M.P. (Alirajpur, Kukshi and Barwani), 1 in Maharashtra (Shahada) and 5 in Gujarat (Kawant, Naswadi, Kewadia, Jitgaon)".

It needs to be pointed out that even though 3 stations are located in Madhya Pradesh, reports for all the 9 stations are being collected by GOG and further action as suggested in the agenda is to be taken by GOG. (Please see page 14 of the Agenda). This was clarified earlier also but the item is still being shown pending against GOMP on the plea of ~~3 observatories lying in M.P. whereas GOG attends to data of~~ all observatories (including the 3 in M.P.). The agenda note needs modification in this regard.

(2) Item No, XLIV -3(207)(h) - Environment management of down stream (of SSP)

The minimum flow to be let down or made available below SSP is yet to be determined by the ESG or the NCA. In the Agenda note for the 43<sup>rd</sup> meeting of ESG held on 27.11.2006 (Page 19) it was mentioned as under:-

"SSNNL/GOG assured that 600 cusecs of flow which is considered adequate by them for maintaining environment conditions in the down stream shall be maintained".

Thus the minimum flow of 600 cusecs is the assessment of GOG on the basis of Wallingford report and not the quantum approved by ESG or NCA. But in the agenda of 7<sup>th</sup> meeting of the Sardar Sarovar Reservoir Regulation Committee (SSRRC) held on 10.3.2007 it was stated that minimum flow to be let down below SSP of 600 cusecs has been agreed to by the party States. It was also

stated in the said Agenda of the 7<sup>th</sup> SSRRC that "the committee may deliberate and decide as to whether the quantum of water released down stream of SSP by GOG from environmental considerations either through river sluice or Godbole gate is to be accounted towards the share of GOG or not". The SSRRC appears to be proceeding further on the basis that down stream flow of 600 cusecs is approved by ESG. This can be inferred from Annexure III to the minutes of the said 7<sup>th</sup> meeting of SSRRC held on 10.3.2007, in which view point of GOG on the requirement of water use down stream of SSP was given. Relevant extract from the said view point of GOG (in Annexure III) is reproduced below for ready reference:-

"Agenda item No. SSRRC/VII-7/07

Requirement of water use down stream of SSP

The agenda item is required to be withdrawn on following grounds:-

The Environment sub-group in its 41<sup>st</sup> meeting, held on 6.1.2005, while discussing item on "Review of the status of Environment Safeguard measures" while discussing the point (h) Down Stream Environment, has taken certain decisions with consent of all party States. The relevant portion of the minutes of the said meeting is enclosed as per Annexure-1. (Annexure 1 was not reproduced in the minutes of 7<sup>th</sup> SSRRC). Thus it is the decision of the environment sub-group which has been endorsed by the NCA. No party State has suggested any change in the recorded minutes of the said meeting and accordingly, the said part of the minutes of the meeting was confirmed in the 42<sup>nd</sup> meeting of the said Sub-group".

Thus GOG has stated that the down stream requirement of 600 cusecs has been endorsed by NCA. On behalf of GOMP the NCA is requested to make available a copy of the Wallingford report on the basis of which the minimum flow of 600 cusecs is arrived at, for examination. A copy of the letter dated 27.6.2007 sent to NCA is enclosed (Enclosure-1) for information of ESG.

In the agenda note for the 44<sup>th</sup> meeting of the ESG held on 16.7.2007, on page 18, the recommendations in the Wallingford Report are mentioned pertaining to provisions for (1) complementary flows for mitigating pollutions (2) operational procedures for dam to facilitate survival of down stream biota (3) developing of mathematical modeling and (4) dilution of releases for keeping the surface as well as ground water in good condition. These recommendations may increase the minimum flow to be let down below SSP. The requirements for navigation are also to be taken into account. The ESG may, therefore, clarify that the minimum flow of 600 cusecs is proposed by GOG and is yet to be approved by ESG or NCA.

**Legal agreements -**

One of the recommendations in the Wallingford report, mentioned in the Agenda for this item (44<sup>th</sup> meeting held on 16.7.2007, page 18) is regarding legal agreements between the party States for regulated releases to ensure that project works as planned. In this connection it is submitted that the Sardar Sarovar Project is being implemented under the provisions of the NWDT Award which are final and binding on the party States. No state can change unilaterally any of the provisions in the NWDT Award. Even the Court is prohibited from interfering with the provisions in the NWDT Award. NCA is set up to see that the project is implemented as per directions in the NWDT Award. Detailed directions are given in the NWDT Award regarding regulated release to be made available from upstream, to SSP. Hence there is no necessity of entering into agreement between party States for letting down regulated releases to ensure that SSP works as planned. This is already being ensured by NCA through the SSRRC.

Attached - Enclosure 1,  
Copy of letter dated 27.6.07.

Encl. 1 112

Ph.0755-2677509 Fax-0755-2677535  
E-Mail [nvdabpl@mp.nic.in](mailto:nvdabpl@mp.nic.in)

**NARMADA VALLEY DEVELOPMENT AUTHORITY  
NARMADA BHAWAN, 59-ARERA HILLS  
BHOPAL, (M.P.)**

No. 1607 /419/NVDA/E/W-2/05  
To,

Bhopal, Dt.. 27 /06/07

Chief Engineer  
and Member Secretary,  
Sardar Sarovar Reservoir Regulation Committee  
Narmada Control Authority,  
Narmada Sadan, Block-B,  
Scheme No.74, Vijay Nagar,  
INDORE 452010

**Subject:- Minutes of the 7<sup>th</sup> Meeting of Sardar Sarovar Reservoir Regulation Committee.**

**Ref.:-** Your office letter No.D-15(119)/2004/CE/243-61 Dated 23.03.07 under which the minutes are circulated.

Sir,

With reference to your office letter dated 23.03.07 the comments/views of this office on the minutes of 7<sup>th</sup> SSRRC meeting dated 10<sup>th</sup> March 2007 are as given below:-

**Item no.SSRRC/ VII-7/07: Requirement of water use down stream of Sardar Sarovar Project.**

In the mentioned item "Requirement of water use downstream of Sardar Sarovar Project please refer to the M(E),NVDA's office letter no. 1040 / 419 /NVDA/E/W/06/Pt.-I Bhopal dated 18.04.2007 vide which it was requested that the matter of water requirement for down stream environment may be placed before the NCA in the next meeting, in view of certain decisions taken during ES Group of NCA in its 41<sup>st</sup> Meeting held on dated Jan-6,2005 under item XL-2(190): Review of the status of Environment safeguard Measures: Sub item A construction schedule(h)/Down stream Environment.

SSNNL had stated that D/s requirement of 600 cusecs was approved by NCA, but it is not clear in which meeting of NCA it was approved

- 5 -

D:\General Files of Engineering\General Files of Engineering\New SS-1,SS-6\SS-1 (2007).doc

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H2

(2) Under the item before the ES Group mentioned above, XL-2(190) (last para vide Pg.10-13), it is stated that:-

"The Managing Director, SSNNL pointed out that the study Report have indicated that 600 cusecs of flow would be adequate for maintaining environment down stream....."

It this matter, please make available study report mentioned in the said minutes for reference in this office.

As you know there is a proposal of providing navigation facilities on the Narmada from Hoshangabad to the Sea (637 Km.). The feasibility study is being carried out by WAPCOS and is in the final stage of its completion. The meetings convened by IWAI in this regard are attended by Secretary, NCA. It may be stated the irrigation Ministers of Madhya Pradesh and Gujarat had agreed in a meeting in Madhya Pradesh Bhawan, New Delhi on 23.02.1992 that "0.7 MAF water below SSP will be made available for navigation by both the States jointly and the position would be conveyed to the Central Government". IWAI had forwarded to NVDA the report of WAPCOS TEF study for development of navigation on the Narmada vide letter No.IWAI/Hy/1(7)/2002 dated 20<sup>th</sup> July 2006 and comments were sent to IWAI vide letter No.2327/II/9/12/Pt.IV/NVDA/E/W-2/05 Bhopal Dated 12.09.2006 including the comments on requirement of navigation <sup>low</sup> ~~between~~ SSP. Copy of the said comments is enclosed for reference. This aspect of requirement of navigation below SSP will have to be kept in view under "downstream requirement".

(b) The Sub-clause No.III of clause No.IX (of NWDT award) regulated releases to be made by Madhya Pradesh for requirement of Sardar Sarovar Project interalia States as below:

"Gujarat may let down water from Sardar Sarovar for its downstream use by making specific indent for it and such releases shall reckon against its share".

According to the above provision, the quantum of water released down stream of SSP at the specific indent by GoG from environmental or other consideration should be accounted towards share of GoG.

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10/11/14

**Item no. SSRRC/VII-8/07 : Water Accounting.**

In the mentioned item it is stated as below:-

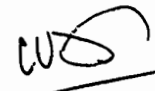
The regeneration qty./flow (i.e. 10% of irrigation use and 60% of Municipal and Industrial use) would come to the river and would get included in observed flow or inflows at various GD sites. So for working out utilizable flow, regeneration qty. need not to be added to virgin flow as it is already included in the observed inflow.

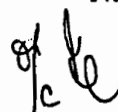
- In the AWA, NCA is relying on the provision in clause IX sub item (iii). Careful examination of the said provision, however shows that the provision is for sharing of water in the next water year. It is not applicable to AWA of a past year. For a past year the utilizable flow (actually available in that year) has to be calculated taking into account the inflow, evaporation losses, regeneration (already included in inflow) and extra use due to carry over i.e. the difference between the total storage in the reservoirs as on 30<sup>th</sup> June of previous year and the year before previous year.

This is for information and further needful please.

Encl.:- One

7/15 to 157.  
(not copied).

  
(V.K. Parikh)  
Member (Engineering)  
Narmada Valley Dev. Authority  
Bhopal, (M.P.)



- 7 -

ANNEX - XLV-(3)**SARDAR SAROVAR NARMADA NIGAM LTD.**

(A Govt. Of Gujarat Undertaking)

**P. K. Laheri**

Chairman &amp; Managing Director

SSNNL/ENV/ESG-44/34/ 948  
October 22, 2007To,  
The Member (E&R)  
Narmada Control Authority  
INDORESub: Minutes of 44<sup>th</sup> meeting of ESG

Dear

This has reference to the minutes of the 44<sup>th</sup> meeting of ESG circulated vide your letter dtd.26.9.2007 wherein, it is stated under item No.XLIV-8(210) that the representative present in the meeting, after detailed deliberation, decided to undertake both Phase-I & II CAT works at the cost of Project.

In this connection, please allow me to recall that at the meeting on cost sharing of catchments area treatment held in MOEF on 9<sup>th</sup> July, we had reiterated the stand of GOG taken in the past and communicated to GOI and had mentioned that as had been decided, the cost of phase-II should not be charged to the project as per guideline issued by MOWR, GOI in its circular dtd.8.7.92 based on the recommendations of the Committee of Secretariats in a meeting held on 3.7.92. GOG did not agree on charging the cost of treating phase-II area to the project. We are still awaiting the minutes of this meeting.

In these circumstances, I would request that the issue may not be treated as finally decided and settled since this does not appear to be reflective of the consensus reached on the meeting held on 9<sup>th</sup> July, 2007

  
(P.K.Laheri)

Kindly see  
the stage

  
26/10/07


  
26/10/07


  
29/10/07

Block No. 12, 1st Floor, New Sachivalaya Complex, Gandhinagar - 382 016, India. Ph : 079 - 23223719, 23252611  
Fax : 079 - 23252370 Web site : [www.sardarsarovarnigam.org](http://www.sardarsarovarnigam.org) E-mail : [info@sardarsarovarnigam.org](mailto:info@sardarsarovarnigam.org)

Dir (Env.)

## ANNEX-XLV-4

## EXTRACTS OF RECOMMENDATIONS FROM FIELD VISIT REPORTS: CURRENT STATUS

## Sardar Sarovar Project in Maharashtra

SN	ACTION/EVENTS	REQUIREMENT	STATUS
1.	<p>CATCHMENT AREA TREATMENT Treatment of Phase-I areas commensurate with progressive impoundment at the cost of the project.</p> <ul style="list-style-type: none"> <li>Physical Targets (Forest &amp; Non-Forest areas)</li> <li>Assessment (Forest Area) <ul style="list-style-type: none"> <li>Forest Cover</li> <li>Silt Monitoring Station</li> </ul> </li> <li>Assessment (Non-Forest Area)</li> </ul>	<p>Ahead of impoundment</p> <p>Report Submitted</p> <p>2 stations established</p> <p>One station established.</p>	<p>Complied.</p> <p>Complied / Progressive</p> <p>Complied / Progressive / Data collected is being analysed.</p> <p>Complied / Progressive / Data collected is being analysed.</p>
2.	Treatment of Phase-II areas at the cost of the project. Time frame to be determined (5 to 6 years time).	Out of a total treatable area of 54707 an area of 29043 was treated up	Slow but steady & progressive.
1.	<p>COMPENSATORY PLANTATION Completion of Compensatory Plantation programme: Physical Targets</p> <ul style="list-style-type: none"> <li>In lieu of R&amp;R</li> <li>In lieu of submergence <ul style="list-style-type: none"> <li>Degraded Forests</li> <li>Non-forest</li> </ul> </li> <li>Assessment (Survival percentage)</li> </ul>	<p>4200</p> <p>12977.08</p> <p>6488.54</p> <p>As per standards of the Plantation by Forest Department in the given area</p>	<p>4197.5 Completed / 2.5 balance</p> <p>Completed</p> <p>86.83 ha. yet to be replaced by other suitable lands &amp; planted up.</p> <p>Survival percentage is low &amp; required further care.</p>
2.	Notification of the Non-forest area for transferring as Forest Area.	Non-forest area to be declared as forests.	Remaining areas of 1242.75 should be expedited

1.	FLORA, FAUNA & CARRYING CAPACITY Survey of both aquatic and terrestrial key species of flora and fauna, rare and endangered species, gene-pool reserve migratory species, migration route, breeding habitat, sanctuary, national park	Prior to submergence	Completed
2.	The rehabilitation of Flora and Fauna Action Plans, development of sanctuaries/increasing the carrying capacity of the adjoining areas if required  a. Measures proposed to rehabilitate endangered species of flora and fauna, if any; b. Assessment of the carrying capacity of the neighboring areas wherein the wildlife would disperse if the scheme is implemented	Prior to submergence	Buffer strip plantation in 500 m width along the periphery of the reservoir is being taken up  Awaited.  Awaited.
3.	Felling operations	Commensurate with progressive filling of the reservoir	27 ha. area remained to be felled.
4.	Stocking of the reservoir for utilization of the trophic burst	Commensurate with progressive filling of the reservoir	Not yet initiated
1.	HEALTH ASPECTS Present status of the waterborne disease in the areas		Completed
2.	Epidemiological Surveillance studies		Phase-II study entrusted to Govt. Medical College, Dhule. Compliance of the observations sent awaited.
3.	Present status of the health delivery system Preventive measures proposed to control the incidence of water-borne diseases		Revised Action plan though received during visit is inadequate.
4.	Reinforcement proposed to the existing health delivery system • On periphery of the reservoir • At RR sites.		As per existing Action Plan incomplete. Progressing
5.	Surveillance of diseases		Inadequate and weak.
6.	Standard formats available with the NICD to be used for diseases surveillance purpose.		
7.	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.		To be examined in more detailed by the NCA expert committee on health.
8.	Progress and Status of the National Programmes under implementation should also be reflected in the reports on the general status of the diseases surveillance and health delivery system in the Project areas.		Awaited
9.	Regular Entomological monitoring is suggested for alterations in ecology of		Awaited, preventive measures planned.

	the area due to irrigation / impoundment.	
10.	It is suggested that sanitary latrines be established at the R&R sites and  Villagers may be educated to use these to keep the cases of Gastro diseases in check.	Awaited  Health Department is performing IEC activities to educate the people. Details awaited.
11.	It was observed that at many places the norms prescribed by the Ministry of Environment & Forests for disposal of the hospital waste were not being adhered to and therefore it was suggested to follow the prescribed norms.	Awaited

#### Sardar Sarovar Project : Govt. of Gujarat

S.N o.	Issues	Recommendations	Current Status
1.	Command Area Development works(protective and restorative). Urgent	Implementation of all identified Environment Safeguard measures is required <i>pari-passu</i> with the development of command area for which Government has to take immediate actions.	Macro plan received for 4100 ha area . Irrigation already commenced over 2.5 Lac Ha area.-, for which even plan was awaited: Infringement of the clearance order
2.	Downstream management plan Urgent	To be prepared and implemented at the earliest without further delay.	Action plan yet not ready
3.	Downstream flows Immediate	Minimum quality of water required for protection of d/s environment is mandatory and has to be ensured.	Measures are yet to be firmed-up to streamline measures for monitoring
4.	Flora and Fauna: Conservation of rare species / variants Urgent	Part area of sanctuaries should be developed as a garden for multiplication of identified rare species, local areas along the canal to be developed to conserve local herbs, shrubs tree species.	Awaited
5.	Felling of trees Urgent	To be taken up/ completed in planned manner commensurate with progressive filling of the reservoir.	Detailed report awaited
6.	Ex-situ & in-situ biodiversity conservation in the command. Urgent	To be taken up before commencement of irrigation.	Awaited
7.	Health Urgent	Considering reported rise in diseases and consequent high risk qualified experts may be involved in preventing recurrence of various diseases.	Detailed report awaited
8.	Efficacy of Catchment area treatment works. Long term	Study to continue at least for a three years period	Awaited

9.	Compensatory plantation Long term	1. There is a need to prepare a list of successful species and to keep the germ-plasm ready for plantations to be taken up in future in the same areas.	Awaited
		2. There is a need to provide for replacement of casualties due to death decay or wilting and to provide support for artificial propagation of the species planted up. If necessary, help from organisation like Arid Zone Research Institute of Central / State Govts. may be obtained.	Detailed report awaited
		3. There is a need to establish seed orchards / clonal orchards for providing support for the activities suggested in para one.	Awaited
		4. There is a need to consider culture of Rhizobium for development of root nodules.	Awaited
		5. There is a need to keep in check infestation of termite through Silvi cultural / chemical control.	Report awaited
		6. In future sufficient number of fruit and fodder trees may be planted up for supporting wildlife in the area of sanctuary.	Ongoing process.
		7. These areas may also be utilised for raising palatable grasses to be as valuable source for protection of these plantations.	Report awaited.

		8. Financial support for keeping planted area in good condition in terms of watch & ward, replacement of casualties and research & development work for promoting natural / artificial regeneration of the identified species.	Report awaited.
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**Sardar Sarovar Project in Madhya Pradesh**

Parameters	Recommendations	Status
Flora Fauna & Carrying Capacity (Terrestrial Eco-system)	EIA studies should be expedited and recommendation implemented before submergence. Impacts have commenced but safeguards measures are not in place.	Field studies commenced report is expected shortly.
Aquatic Eco-system	Up-dating of plan and implementation should be high priority. Impacts have commenced but safeguards measures are not in place.	Not yet started. Up-dation of plan needed.
Health Aspects	Implementation of the action plan on ground should have been completed and disease monitoring required on long term basis.	Report awaited.
Felling of trees	Coppice crop of the forest felled earlier required removal on priority.	Completed, detailed report awaited.
Quality of CAT works	Silt monitoring is to be started as early as possible.	Not yet started
Catchment Area Treatment (Physical)	Subject to availability of resources, to revisit the areas for maintenance & casualty replacement.	Awaited.
Compensatory Plantation Physical targets	To revisit the areas for maintenance & casualty replacement.	Awaited.
Quality of CAF works	Crop Diameter and Crop height required to be assessed by complete enumeration through identified agencies.	Not yet started
Seismicity & Rim Stability	Recommendations of the dam Safety review panel should be put up to the Sub Group from time to time IMD may be requested to provide V-Set communication facilities for all observatories.	Report awaited.

**Annexure- XLV- (5)****Key stipulations contained in the environment / forest / investment clearance to the SSP by the departments / agencies of the Govt. of India**

- (i) Until approved plan for environmental safeguard measure is implemented water should not be used for irrigation purposes.
- (ii) Command Area Development Plan & Implementation of the water delivery and drainage system along with implementation of the measures proposed in the plan for safeguarding the environment. In addition the Environment Subgroup has issues directions from time to time for guiding the development of Command area Development plan
- (iii) Command area involves both the management of plant as well as human aspects. The details have to be collected on the following:  
Existing land use, irrigation status, cropping pattern, water availability-surface and ground; natural drainage pattern, induced drainage, yield, permeability, precipitation distribution, salinity and alkalinity problems, soil profile, land capability.  
  
Cropping pattern, rationale and controlled water use; training for skills up gradation; package of irrigation water, seeds, fertilizers, insecticides, pesticides with controls; surface and subsurface drainage.
  - 1) Land capability survey of the area which are proposed to be brought under irrigation along with the soil profiles;
  - 2) Identification of the areas prone for water logging and salinity;
  - 3) Details of the drainage works proposed in the command and the norms based on which these details have been planned;
  - 4) On-farm development works proposed and the assistance proposed to be given to the farmers to ensure conjunctive use of water;
  - 5) Details of the present and proposed cropping pattern;
  - 6) Steps proposed to prevent contamination of ground and surface water due to fertilisers, pesticides, runoff.
- (iv) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and In the wasteland/vacant land under the control of the Irrigation Department
- (v) A programme of drainage and ground water balance studies has been completed for Mahi Narmada-Doab. Such a programme must be completed for the areas beyond the Mahi. The Bhal, Saurashtra, Kutch. Sami-Harij and other areas require this as a pre-condition.
- (vi) The State should set up a special group of experts to study the siltation aspect in the main canals under all operating conditions since such siltation, if occurs, is likely to pose a serious problem during the actual operation of this project and may require a huge expenditure for desilting as well as result into serious operational difficulties.
- (vii) State should draw up a detailed time schedule for completion within five years the Investigation, detailed survey, planning and working out the detailed cost estimates for micro level network system for the balance area of the total command of this project.
- (viii) Past experience of Irrigation projects have revealed that main and branch canals are completed up to the end but, in absence of micro-level networks to take irrigation water up to outlet, corresponding Irrigation benefits do not start



accruing in spite of huge financial investment made. To avoid this, the State should draw up an implementation schedule, segment wise, for completion of canal network, in such a way that a segment of the canal network, taken up from head reaches is completed in all respects so as to make the irrigation waters available, for the designed potential of that segment, up to the outlet in that particular segment.

(ix) Key issues identified by CAD wing of MOWR are as below

- i. Modernisation, maintenance and efficient operation of the irrigation system up to the outlet with discharging capacity of 30 litres per second (1 cusec approx.).
- ii. Development of field channels within the command of each outlet to distribute the water efficiently.
- iii. Land levelling and shaping on an outlet command basis for even distribution of water over the field and to achieve economy in water application.
- iv. Enforcement of a proper rotational schedule of irrigation water delivery for fair distribution of water to each farm holding.
- v. Selection of suitable cropping pattern so that minimum quantity of water may give better results.
- vi. Strengthening of the extension services to disseminate knowledge of optimum water use among the farmers.
- vii. Use of wireless network for proper regulation of water for crop use.
- viii. Construction of field drains in the outlet commands.
- ix. Development and maintenance of the main and the intermediate drainage system.
- x. Promoting conjunctive water use through the development of groundwater for supplementing surface irrigation.

केवल सरकारी प्रयोग के लिए  
For Official Use Only



**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**पैतालीसवीं बैठक का कार्यवृत्त**  
**Minutes of the 45<sup>th</sup> Meeting**

24 अप्रैल, 2008 को  
पर्यावरण भवन, नई दिल्ली में हुई  
Held at Paryavaran Bhawan, New Delhi on 24<sup>th</sup> April, 2008

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

इन्दौर  
मई, 2008

**Indore**  
**May, 2008**

**MINUTES OF THE 45<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP  
I N D E X**

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**MINUTES OF THE 45<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF THE  
NARMADA CONTROL AUTHORITY HELD ON 24<sup>TH</sup> APRIL, 2008  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

The 45<sup>th</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held on 24<sup>th</sup> April, 2008 at Paryavaran Bhawan, CGO Complex, New Delhi under the Chairpersonship of Ms. Meena Gupta, Secretary, Ministry of Environment & Forests (MoEF), Govt of India.

List of participants is enclosed at Annexure-XLV-Min-(1). A copy of the letter received from Expert Member, Dr. Shekhar Singh, addressed to the Secretary, Ministry of Environment and Forest conveying his view points and seeking leave of absence is placed at Annexure-XLV-Min-(2).

The Chairperson, at the outset, welcomed all participants to the meeting and after self introduction of the participants, the agenda items were taken up for discussion.

**Item No. XLV-1(205): CONFIRMATION OF MINUTES OF THE 44<sup>TH</sup> MEETING  
OF THE ENVIRONMENT SUB-GROUP.**

Minutes of 44<sup>th</sup> Meeting of Environment Sub-Group of Narmada Control Authority held on 16<sup>th</sup> July, 2007, were circulated to all Members and Invitees vide Narmada Control Authority office letter No.Env-3(44)/2007/3027-3067 dated 26.09.2007.

Govt of Gujarat, vide letter No.SSNNL/ENV/ESG-44/34/948 dated October 22, 2007, the Government of Madhya Pradesh, vide their letter of 6<sup>th</sup> Oct. 2007, 30<sup>th</sup> Oct. 2007, 7<sup>th</sup> Nov. 2007 & 9<sup>th</sup> April, 2008 Annexure-XLV-Min-(3), sought modifications in the minutes.

The Sub-group discussed the issues brought out by the above referred letters and decided as under:

1. Only those comments, which seek modifications in the recording of the minutes of the meeting would be considered. Comments or views in the matter could be taken up as a separate agenda items for discussions during the meeting.
2. Modifications suggested by Govt of Madhya Pradesh were taken up as follows:-
  - a. Under item XLIV-2(206) & XLIV-3(2007). The following sentence on page 4;

“.....handed over to respective owners, therefore, it was not possible to revisit the areas for any maintenance work. Farmers carry out maintenance work on their field at their own.....”

was substituted with;

“.....handed over to State Forest Department after undertaking maintenance for the period prescribed in the action plan approved by GOI, MoEF. The State Forest Department is taking care of these areas.....”
  - b. Modification suggested under item XLIV-8(212): pertain to the statement of the representative of the Ministry of Agriculture. Therefore, the same would be forwarded to Ministry of Agriculture for their comments.

3. As regards the comments of GoG on item XLIV-6(210), the decisions with regard to charging and sharing of cost of Catchment Area Treatment works were taken after detailed deliberations and considering the view points of Party States, as specifically asked for by RCNCA. These decisions would again be considered in NCA/RCNCA. No change in the recording of the minutes is necessary.

Minutes were confirmed with above modifications.

**Item No. XLV-2(206): INDIRA SAGAR PROJECT: REVIEW OF THE STATUS  
OF ENVIRONMENT SAFEGUARD MEASURES.**

The Vice Chairman, NVDA referred to his letter dated 17<sup>th</sup> April, 2008 Annexure-XLV-Min-(4) addressed to the Executive Member, NCA enclosing Action Taken Report for discussions during 45<sup>th</sup> meeting of the Environment Sub-group, which *interalia* included updated progress on both Indira Sagar Project (ISP) & Sardar Sarovar Project (SSP). He also brought to the notice of the Sub-Group the judgment dated 8.9.2006 in WP (C) No.3022/2005 of the Hon'ble High Court of Madhya Pradesh, Jabalpur Bench that NCA has fundamentally no role vis-à-vis Indira Sagar Project. Hence, the Sub-Group should not monitor the Environmental Safeguard Measures of Indira Sagar Project. The Vice Chairman, NVDA reiterated that Govt of Madhya Pradesh has no objection to monitoring of Indira Sagar Project by Ministry of Environment & Forests.

Executive Member, NCA pointed out that the said judgment of Hon'ble High Court, Jabalpur pertained to R & R issues and para (o) of the said judgment had specified a role for NCA in respect of Indira Sagar Project. He further informed that the issue is under consideration of the Hon'ble Supreme Court in SLP 935/2007.

The GoMP representative, further, brought to the notice that NCA in its 78<sup>th</sup> Meeting held on 3.5.2007 had decided to discontinue monitoring of Indira Sagar Project. Member (E&R), NCA clarified that it has been clearly explained in the agenda and minutes of the 78<sup>th</sup> meeting of NCA that only monitoring of construction of ISP was decided to be discontinued and NCA will continue to follow the directions of Hon'ble High Court of M.P. as well as other Courts with regard to ISP.

Chairperson stated that the Clearance from Environmental angle by the Ministry of Environment & Forests to the Sardar Sarovar and Narmada Sagar (later-on renamed as Indira Sagar) Projects was given on the condition that

Narmada Control Authority would ensure that the Environmental Safeguard Measures are planned and implemented *pari-passu* with the progress of work on the projects. These conditions could neither be modified nor withdrawn by the NCA or its Sub Groups.

Thereafter, the Sub-Group reviewed the status of Environment Safeguard Measures as brought out in the Agenda Notes. The Govt of Madhya Pradesh stated that they had submitted the latest progress on the Indira Sagar Project in the form of Action Taken Report. Progress may be reviewed from this ATR and they had no further comments.

Prof. R.K. Katti, Expert Member pointed out that Govt of Madhya Pradesh had not fully complied with the directions of Environment Sub Group even though ISP Reservoir has already been filled to EL. 260 m. just about 2m short of FRL.

Based on the status as brought out in the Agenda Notes on survey, studies & implementation of the Environmental Safeguard Measures indicating infringement of the conditions contained in the order of clearance on key areas of concern specially protection to the wildlife from the submergence area, as suggested by the Wildlife Institute of India, the EIA Study group for Indira Sagar Project, key aquatic species including fishes/otters and other rare, endangered wildlife, eutrophication, emission of green house gases, etc., the Chairperson, directed MoEF official to take note for initiating suitable action in this regard. It was decided that Forest Conservation Division of the Ministry of Environment & Forests may be requested to expedite their decision on the request of GoMP to permit fishing in the part of ISP reservoir coming under reserve forest area, keeping in mind the EIA should be completed at this instance of the Environment Sub Group.



**Item No. XLV-3(207): SARDAR SAROVAR PROJECT:****A) PRESENTATION OF THE REPORT OF THE COMMITTEE ON FIELD VISIT TO THE AREAS IN MADHYA PRADESH, GUJARAT & MAHARASHTRA**

Director (Env), NCA informed that during 42<sup>nd</sup> meeting held on 7<sup>th</sup> April, 2005, Sub-Group directed regular field verification of the works undertaken by the Project authorities on implementation of Environmental Safeguard Measures. In pursuance, field visits were undertaken to the ISP & SSP areas in Madhya Pradesh & Gujarat areas earlier and field visit to the SSP areas in Maharashtra was undertaken in January 2008. Copies of the reports containing recommendations of the committee were forwarded to all concerned for needed follow-up.

The Chairperson requested all concerned for submission of compliances on the outstanding issues.

**B) REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

The Vice Chairman, NVDA desired that the Sub Group should specifically review the status with reference to Full Reservoir Level (FRL). It was clarified that the only stage of raising of the dam left, is upto FRL only. The issues presented in the agenda items are intended to review the status of implementation w.r.t. FRL. Thereafter, discussions took place on various components of Environment Safeguard Measures.

**(a) CATCHMENT AREA TREATMENT**

The Sub-Group reviewed the status as presented in the Agenda Notes. CAT works in Phase-I area has almost been completed. Phase II area has been treated fully in Gujarat. Remaining area of Phase-II in Maharashtra and Madhya Pradesh should be completed during next 5/6 years' time.

The Vice Chairman, NVDA referred to the decision of Committee of Secretaries dated 08.07.1992 which suggested that major irrigation projects are not to be loaded with CAT expenditure on freely draining areas. Additional Director, MoEF pointed out that in the same order, it was also mentioned that Ministry of Environment & Forests would decide as to how much of the Phase-II area will have to be treated *pari-passu*.

The Vice Chairman, NVDA referred to GoMP letter no.E&F/Tech/2135 dated 30<sup>th</sup> October, 2007 and desired that Ministry of Agriculture, Govt of India should provide necessary funding for treatment of Phase-II areas as grant without any loan component and make NVDA as separate nodal agency for carrying out CAT works in Narmada Valley along with Agriculture Deptt. of State Government to facilitate timely & effective implementation of CAT works.

The Chairperson stated that decisions have already been taken with regard to charging and sharing of cost of CAT works. Regarding funding under Macro Management mode, as the issue pertains to Ministry of Agriculture, it would be referred to them.

**(b) COMPENSATORY PLANTATION:**

The Sub Group reviewed the status of Compensatory Plantation. It was noted that M.P. and Gujarat have completed necessary compensatory plantation. GoM representative informed that only 88 ha area out of 19466 ha is remaining, which would be completed during forthcoming monsoon.

Party States, further, informed that about 89% of the area planted in Madhya Pradesh, 80% in Maharashtra and 96% in Gujarat has been notified under section 4 of Forest Act, 1927. Action is in progress for notification of balance areas.

Additional Director, MoEF referred to some representations received in MoEF regarding failure of the plantations with abysmally low survival and stated that according to the complaint received one sugar factory had been commissioned on the site shown as SSP plantation site. Chairperson stated that representations received would be forwarded to the concerned State Govts. for their comments and further necessary actions.

**(c) COMMAND AREA DEVELOPMENT:**

**Gujarat:**

Director (Env.), NCA appraised the Sub-Group about a special meeting of GoG, MoWR, MoEF and NCA Officers regarding preparation of revised Command Area Development Plan by Govt. of Gujarat, held on 23.4.2008 under the Chairmanship of Chairperson, ESG & Secretary, MoEF. It has been decided that GoG Officers would discuss the matter with NCA Officers and expedite submission of revised CAD Plan.

**Rajasthan:**

Member (E&R), NCA informed that notional supply of water to Govt. of Rajasthan had commenced with initial discharge of about 50 cusecs during 3<sup>rd</sup> week of March, 2008. Since Narmada water to Rajasthan has started flowing, there was an urgent need for preparation of Command Area Development Plan towards mitigation of identified environmental impacts.

Director (Env), NCA brought out that in pursuance to the discussions of the Environment Sub-Group, series of discussions were held and Terms of References (ToR) for EIA studies on Biological resources, health impacts, soil, pollutants, etc., were framed and agreed to for addressing identified environmental concerns. A field visit to the Command Area in Rajasthan was also undertaken recently on 8<sup>th</sup> to 10<sup>th</sup> April, 2008.

Chief Engineer, NCP, Rajasthan stated that as per agreed ToR, studies have been given to Wildlife Institute of India and the work order is under issue. For the health impacts, ICMR has agreed for carrying out studies as being done by them for Narmada Projects in Madhya Pradesh. On the issue of ground water for use for irrigation purposes, State Ground Water Board is being involved for the needed studies. Water & Power Consultancy Organisation of the Ministry of Water Resources, Central Arid Zone Research Institute of ICAR are also being involved in preparing Command Area Development Plan.

The Chairperson suggested expeditious completion of the works in hand for putting a meaningful plan in place, as required.

(d) **FLORA, FAUNA & CARRYING CAPACITY**

i) **Terrestrial Environment**

The status of implementation of the recommendations contained in the Environmental Impact Assessment studies carried out by the Agencies engaged by Govt. of Gujarat, Govt. of Maharashtra and Govt. of Madhya Pradesh were reviewed by the Sub-Group.

Govt. of Gujarat representative informed that development of Shoolpaneshwar Wild Life Sanctuary and Bio-Diversity Conservation Plan is in progress. Govt. of Maharashtra representative informed that 90% of the works in Buffer Zone Plantation has been achieved and balance work would be completed soon. Govt. of Madhya Pradesh representatives informed that they have received report of Wild Life Institute of India, which is under consideration of Narmada Valley Development Authority / Govt. of Madhya Pradesh. Social Forestry Plan has been taken up in a big way, which is likely to be completed very soon. About 60 Islands formed in the reservoir having area from 1 to 75 ha are being left

undisturbed for the study of the process of natural succession and to provide refuge to bird life in the area.

ii) **Aquatic Environment**

Director (Environment), Narmada Control Authority informed that the plan for conservation of Aquatic Environment need to be updated considering the guidelines circulated by the High Level Expert Group (HLEG) on Fisheries under the Chairmanship of Joint Secretary (Fisheries), Ministry of Agriculture, Govt. of India. Similarly, stocking of the reservoir needs to be taken up immediately. Other Conservation measures as recommended by CICFRI studies also need to be fully implemented.

Govt. of Gujarat representatives informed that stocking in the Sardar Sarovar reservoir is being continued and MoU has been signed with CICFRI and further action would be taken according to the recommendations of the studies. Govt. of Maharashtra and Govt. of Madhya Pradesh representatives informed that stocking of the reservoir will commence soon.

The Vice Chairman, NVDA stated that Govt. of Madhya Pradesh has its well initiated policy towards the Fisheries Development and decision taken by the HLEG need to be brought up in NCA for discussion and approval from party States.

iii) **Felling of Trees**

The Sub-Group reviewed the status of felling of trees in the submergence area as brought out in the Agenda notes.

Govt. of Gujarat representative informed that felling of trees has been completed. The Coppice crops have also been removed as submitted vide letter No.1480 dated 15.02.08. GoM representatives informed that tree felling in about 27 ha of area are only remaining. GoMP reported vide letter dated 15.04.08 that about 10% trees are remaining to be felled in non-forest areas.

**(e) Seismicity & Rim Stability**

The Sub-Group reviewed the status of monitoring of seismic activities at key locations around the reservoir. GoG representatives informed that 9 seismic monitoring stations along the periphery of the reservoir, 4 on either side and 1 at the downstream of Sardar Sarovar reservoir have been set up. Data from these monitoring stations are being regularly collected and put up before the Dam Safety Review Panel of Sardar Sarovar Project.

Member (E&R), NCA submitted that necessary actions with regard to Seismicity & Rim Stability has been completed including setting up of institutional mechanism for periodic collection of seismic data and their review by Dam Safety Review Panel. Hence, this aspect may be taken as complied with. The Sub-Group agreed.

**(f) Health Aspects**

The Sub-Group reviewed the status of implementation of the recommendations of the Committee on Health Experts as brought out in the agenda notes.

Director (Environment), NCA informed that during the meeting held with certain Project Affected Persons on 26.03.08, the Chairperson has directed that Expert Committee on Health should re-visit the areas and submit its findings. The copies of the representation received from MoE&F would also be forwarded to the concerned State Governments for their comments and further necessary action.

Thereafter, some discussions took place with regard to the format of monitoring of water borne diseases. The Sub-Group felt that this aspect including review of the status of implementation of Health Aspects should be carried out by the Committee of Health Experts.

**(g) Archaeology & Anthropology**

The Sub-Group reviewed the status of issues on Archaeology & Anthropology as brought out in the Agenda notes and felt that necessary works have been completed.

**(h) Environmental Management of Downstream Area**

Member (E&R), NCA drew the attention of the Members to the comments of Govt. of Madhya Pradesh vide their letter No.2206 dated 7.11.2007 (page 34-37 of the Agenda) asking for clarification regarding approval of Environment Sub-Group or Narmada Control Authority with regard to minimum flow of 600 cusecs for maintaining Environmental conditions in the downstream areas. Govt. of Gujarat representatives informed that downstream requirement of 600 cusecs for Environmental purposes has already been endorsed by the Environment Sub-Group and should not be reopened. GoMP representatives asked for the copies of HR Wallingford report or any other report on the basis of which the minimum flow of 600 cusecs has been arrived at.

After some discussions, it was clarified that minimum flow of 600 cusecs towards Environmental requirement for downstream areas has the endorsement of Environment Sub-Group and since this quantum of water could not be used by Gujarat and has to let down into the sea, it would not be accounted towards the utilizable flow of Narmada river or reckoned against the use by Govt. of Gujarat.

**Item No.XLV-4(208) – LEGAL ISSUS ARISING OUT OF AN APPLICATION  
FILED BY SNEH**

Director (Environment), NCA informed that during the course of hearing on 3.12.2007, Central Empowered Committee constituted by Hon'ble Supreme Court of India had suggested that the issue may be resolved within the framework of NCA. Accordingly, a meeting was arranged by NCA on 22.01.2008, the minutes of which have already been circulated.

The Sub-Group noted the information.



**Item No.XLV-5(209) - SHARING THE COST OF THE TREATMENT OF  
FREELY DRAINING CRITICALLY ERODED  
CATCHMENT AREA**

Director (Environment), NCA informed that another meeting was convened by the Secretary, Ministry of Environment & Forests and Chairperson, Environment Sub-Group on 16.04.08 with the representatives of NCA, party States, Ministry of Water Resources, Ministry of Environment & Forests, the minutes of which have already been circulated.

After detailed deliberation, it has been decided in the said meeting that cost of treating critically degraded sub-watersheds in the free draining catchments, including both Phase – I (directly draining) and Phase - II (other than directly draining) shall be treated at the project cost and provided for under Unit – I (dam and appurtenant works) and shared in the ratio of the costs charged to Unit-I amongst the party States (Gujarat = 51%, Madhya Pradesh = 32%, Maharashtra =15% and Rajasthan =2%)

**Item No.XLV-6 (210) - REVIEW OF THE ACTION TAKEN ON THE  
DECISION OF THE PREVIOUS MEETINGS.**

The Sub-Group noted the information as brought out in the Agenda notes.

**Item No.XLV-7 (211) - ANY OTHER ITEM****(i) Permission for taking up further work on the Sardar Sarovar Dam**

The Vice Chairman, NVDA stated that there has been substantial compliance with regard to Sardar Sarovar Project on the conditions stipulated at the time of clearance, and hence, permission may be granted for taking up further work on the Sardar Sarovar Dam. He emphasized that power is required to be harnessed at the earliest. He, further, promised submission of compliances on the remaining issues soon.

Managing Director, SSNNL brought to the notice of the Sub-Group that two major works on dam are remaining before it could be possible to raise water level further, i.e.,

- i) Construction of piers & bridge
- ii) Fixing of the Radial Gates.

He, further, stated that it will take at least 30 months to complete the above works.

Director (Environment), NCA pointed out that though physical targets towards Catchment Area Treatment Phase-I & Compensatory Afforestation have been achieved by the Govt. of Madhya Pradesh but verification of their efficacy, as suggested earlier by the Sub-Group, is yet to be completed. Though submergence has already commenced, issues related to notification of protected areas as recommended in the EIA studies is still under examination. There have also been some deficiencies on implementation of the Health Plan as received from the NVDA. Similarly, measures recommended by the EIA studies on Flora & Fauna in the State of Gujarat & Maharashtra have not been fully implemented. The Management Plan for protection of Aquatic Eco-system has also not been fully implemented in Maharashtra & Madhya Pradesh. It would, therefore, be

desirable to review progress of work with reference to the conditions stipulated in the order of clearance in detail before considering further work on the dam.

Member (E&R), NCA, further, added that Command Area Development Plan for Gujarat and Rajasthan had not been yet finalized. Moreover, the issue of taking up further work on SSP has not come as an agenda item.

The Executive Member, NCA pointed out that few Interlocutory Applications on the matters pertaining to previous permission to raise the dam height upto EL 121.92 m is before the Hon'ble Supreme Court. The Hon'ble Court has also given certain directions to the GoMP for compliance. This is still awaited.

In response to a query from Executive Member, NCA, the Managing Director, SSNNL stated that there would only be a very marginal additional temporary submergence due to construction of piers.

Additional Director, MoE&F brought to the notice of the Sub-Group that several representations have been received in MoE&F, and there is a need for verification of the facts before the claim of substantial progress could be accepted.

Dr. B.G Varghese, Expert Member, pointed out that project was already over delayed and stated that purely considering the implications of cost over runs and to ensure drawing of the long awaited benefits from the project at the earliest, he would like to recommend taking up further work on the dam.

Prof. R.K Katti, Expert Member agreed with the view of Dr. B.G Verghese. He, however, suggested that implementation of the Environmental Safeguard Measures should be completed before considering raising of water level.

During the deliberations that followed, the State Governments concerned promised to take necessary steps expeditiously to remedy the deficiencies in the implementation of the Environmental Safeguards, within the next two to three months.

It was decided that except for this there are no other major environmental issues in taking up further works on Sardar Sarovar Project without raising water levels, as far as Environment Sub-Group is concerned.

The Sub Group therefore recommended construction of pierce and overhead bridge but NO installation of gates until further review. Construction of pierce and overhead bridge will cause additional submergence of 1.62 mt. Environmental Safeguard Measures commensurate with this additional submergence should be completed in time.

The Status of compliance on implementation of the Environment Safeguard Measures would be reviewed during next meeting to be convened during June or July 2008.

**(ii) Reconciliation of status of compliance between party States and NCA Secretariat**

The Chairperson observed that there have been considerable differences in the status of progress presented by the NCA Secretariat and the progress being informed by the State Governments and that these issues could not be verified in such meetings and are required to be sorted out before convening meeting of the Environment Sub-Group at the level of the NCA with the party States.

**Item No. XLV-8 (212): DATE & VENUE OF THE NEXT MEETING**

Next Meeting of the Environment Sub-Group will be held on 20<sup>th</sup> June, 2008 at 11.-00 a.m. in the Committee Room of the Ministry of Environment Forests.

# ANNEXURES

**ANNEX-XLV-Min-(1)****LIST OF PARTICIPANTS OF THE 45<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 24<sup>th</sup> APRIL, 2008 AT PARYAVARAN BHAWAN, NEW DELHI.****Ministry of Environment & Forests, New Delhi**

1. Ms. Meena Gupta, Secretary, MOEF, New Delhi.
2. Dr. S. Bhowmik, Addl. Director, MOEF, New Delhi.

**Narmada Control Authority**

1. Shri V.K.Jyothi, Executive Member, NCA, Indore
2. Shri M.K.Sinha, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore
4. Shri Kuntal Roy, Dy. Director (Env.) NCA, Indore.
5. Shri Upendra Singh, Dy. Director (Env.) NCA, Indore.

**Sardar Sarovar Construction Advisory Committee**

1. Shri Nirmal Jot Singh, Secretary, SSCAC, Vadodara

**Indian Council of Agricultural Research**

1. Dr. A.K. Gogoi, ADG (Agronomy), I.C.A.R., New Delhi.

**Botanical Survey of India**

1. Dr. K.K. Khanna, Dy. Director, B.S.I., Allahabad.

**Expert Members**

1. Prof. R.K Katti Expert Member, New Delhi.
2. Dr. B.G. Verghese, Expert Member, New Delhi.

**GOVERNMENT OF GUJARAT**

1. Shri A.K. Joti, M.D., SSNNL, Gandhinagar.
2. Shri R.K. Tripathi, Jt. M.D. S.S.N.N.L., SSNNL.
3. Dr. S.D. Vora, Conservator of Forests, SSNNL, G'Nagar..

**GOVERNMENT OF MADHYA PRADESH**

1. Shri Pradip Bhargava, Vice Chairman, N.V.D.A., Bhopal.
2. Shri L.K.Sood, C.C.F., NVDA, Bhopal
3. Shri R.K. Behre, Director (CAD), NVDA, Bhopal
4. Smt. Sunita Gate, Commissioner, Archaeology, Bhopal.
5. Dr. A.N. Mittal, Joint Director Health, Govt. of M.P.

6. Shri L.K. Wagh, Advisor, NVDA, Bhopal.
7. Smt. Dipti Gargava, Project Officer, NVDA, State Archaeology & Museum, Banganga Road, Bhopal.
8. Dr. R.K. Bhatt, G.M. (Env.), NHDC, Bhopal.
9. Shri Devraj Barua, Asstt. Manager, N.H.D.C. Ltd., Bhopal.
10. Shri S.H. Mishra, D.M., NVDA Bhopal.
11. Shri H.S. Kataria, Liaison Officer, NVDA, Bhopal.
12. Dr. B.N. Nagpal, Dy. Director, National Institute of Malaria Research. 20 Madhuban, Delhi.

**GOVERNMENT OF MAHARASHTRA**

1. Shri S.L. Goyal, Secretary (Environment), Govt. of Maharashtra.
2. Shri J.P. Dange, A.C.S, Irrig. Dept., Govt., of Maharashtra.

**GOVERNMENT OF RAJASTHAN**

1. Shri N.R. Rai, Chief Engineer, N.C.P. Sanchoe,
2. Shri H.R. Shrimal, SE, Narmada -II, Sanchoe, Rajasthan.
3. Shri P.K. Upadhyaya, Dy. Secretary, Environment, Jaipur.



**ANNEX - XLV-Min-(2).**

24 April 2008

Ms Meena Gupta, IAS  
Secretary  
Ministry of Environment and Forests  
Government of India  
New Delhi

Dear Ms. Meena Gupta,

I was fully intending to attend the sub-group meeting today, but am not feeling too well. I will still try and attend, but if I am not able, I am sending you some specific points that you may kindly consider and incorporate in the proceedings of the meeting.

The most important issue before the sub-group is to take a view on the compliance reports on various aspects submitted by the project authorities. As you are aware, even on the basis of the information submitted by the project authorities, the state of compliance is far from satisfactory and in many cases far behind what was required. You had, in the last sub-group meeting, directed that the various outstanding matters and slippages be resolved in the next three months and accordingly reported. However, this does not appear to have happened and, in fact, some of those issues seem to have dropped of the agenda altogether.

However, more important, serious doubts have been raised about the accuracy and adequacy of the reports emanating from the project authorities about various aspects of compliance, especially relating to catchment area treatment and compensatory afforestation, their extent and their quality. I believe you have also been sent some of the relevant reports and photographs. I have also got news from multiple sources that matters are not always as reported to the sub-group.

Therefore, I would strongly urge you to please consider once again insisting (in accordance with a decision made four meetings back) that aerial photographs and remote sensing data be urgently collected and analysed by an independent scientific agency and the reports made available to the subgroup on the extent and survival rates of afforestation work done both as a part of the CAT and compensatory afforestation.

Similarly, I would strongly urge you to request an independent agency to urgently do a field verification and submit a report to the sub-group of the claims and counter claims made by the project authorities and the activists, on all the various aspects of compliance. The initial survey could be done quickly and only look at the doubts raised by the movements in the valley. Subsequently, a long term and independent scientific monitoring system needs to be set up - independent of the major stake holders so that there is public confidence in their findings.

I would strongly urge you not to take a view on the compliance reports submitted to the sub-group till analysis of aerial and remote images and rapid field surveys are available.

My apologies if I am not able to attend the meeting.

With kind regards

Shekhar Singh

Shekhar Singh  
C 17A Munirka,  
New Delhi 110 067

AD (Dr. B. B. Bhowmik) 24/4  
1855/IR  
24/4/08

**ANNEX - XLV-Min-(3).**

**NARMADA VALLEY DEVELOPMENT AUTHORITY  
59, Narmada Bhawan, Arera Hills, Jail Road, Bhopal- 462 011**

No .. NVDA/E&F/<sup>Tech</sup>~~040~~/08/ 530

Bhopal, Date: 09-04-2008

To,

The Member Secretary,  
Environment Sub-group,  
Narmada Control Authority,  
Sector B, Scheme No. 74-C,  
Vijay Nagar, Indore-452010

**Subject:** Minutes of the 44<sup>th</sup> meeting of the Environment Sub-group of Narmada Control Authority, held on 16<sup>th</sup> July 2007.

**Reference:** Agenda Item No. XLIV-6(210) : Sharing the cost of the treatment of freely draining critically eroded catchment area

Kindly refer to the minutes of the 44<sup>th</sup> meeting of the Environment Sub-group of Narmada Control Authority, held on 16<sup>th</sup> July 2007 wherein following is recorded under the agenda item No. XLIV-6(210) : Sharing the cost of the treatment of freely draining critically eroded catchment area-

“Director (Env.) informed that a special meeting convened by Secretary, MoEF and Chairperson, Environment Sub-group on 9<sup>th</sup> July 2007 of representatives of NCA, Party States, MoWR, MoEF and Planning Commission. After detailed deliberations, it was decided to undertake both Phase-I and II CAT works at the cost of SSP.”

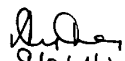
Above statement does not show the reservations made by the representatives of GoMP on the subject.

2. It is, therefore, proposed that the following views expressed by GoMP may be included in the minutes :-

“ Representative of GoMP stated that the clearance issued from environmental angle in 1987 identified the Phased Catchment Area Treatment, as one of the environmental safeguard measures required to be planned and implemented pari passu with the progress of work on the project and imposed a condition that the catchment area treatment (CAT) programme and the rehabilitation plans be so drawn as to be completed ahead of reservoir filling. While according approval to the diversion of forest land for Sardar Sarovar Project, GoI, MoEF under section 2 of the forest (Conservation) Act, 1980 had

stipulated that a plan for the treatment of catchment area will be prepared by 31.3.1989 and implemented at the cost of the project. D.O. letter of MoEF dated 4.2.1988 laid down the details to be covered in the CAT plan including treatment of degraded and vulnerable area. All India Soil & Land Use Survey under GoI, MoA&C had prioritized the sub-watersheds of Narmada catchment into 5 categories out of which sub-watersheds deserving very high and high priority were critically degraded. However, in July 1992 the Committee of Secretaries directed to treat only directly draining critically degraded sub-watersheds at the cost of the project. GoI, MoE&F, have not yet amended the conditions of clearance. It is necessary that the conditionality of carrying out the entire CAT work (directly draining as well as freely draining) at the cost of the project, is modified otherwise the project authorities would be required to treat the critically degraded sub-watersheds within the entire catchment at the cost of the project, which will in turn overburden the project.

He also drew the attention of the Members that given the resources at their command Govt. of Madhya Pradesh would not be able to treat the areas pari-passu with engineering works on the project or ahead of impoundment and therefore the time frame for treating the Phase-II areas may also be resolved."

  
9/04/2008

Member (Environment & Forest)  
Narmada Valley Development Authority

**ANNEX - XLV-Min-(4).**

**Narmada Valley Development Authority**  
**59, Arera Hills, Narmada Bhawan, Bhopal**

No.NVDA/E&amp;F/07/ Tech. | 40

Dated 17/ 04/08

To

**Shri V.K. Jyoti,**  
 Executive Member,  
 Narmada Control Authority,  
 BG-113, Scheme No.74-C,  
 Vijay Nagar, Indore(M.P.)

**Subject :-** Action Taken Report of 45<sup>th</sup> meeting of ESG to be held on 24.04.2008  
**Ref. :** Your letter No.Env.-3(45)/2008/1074-1114 dated 8.4.2008

With reference to above I am to invite your attention to order passed by Hon'ble High Court of Madhya Pradesh on 8.9.2006 in miscellaneous Writ Petition No.3022/2005, between Narmada Bachao Andolan NHDC, NHPC, NVDA, NCA & Union Govt. (Photocopy enclosed).

The relevant para-(4) of the said order is reproduced as below :-

"The Narmada Control Authority had fundamentally no role vis-à-vis Indira Sagar Project. In any case the same had been paled and melted into insignificance because of the interlocutory orders by this court from time to time ascribing the role to the said authority and Sub-Group of the same."

The above order clearly says NCA do not have any role in ISP and as such any monitoring by any of sub-group of NCA may amount to infringement of Hon'ble High court order. Even though the order of the High Court is passed with reference to R&R of the PAFs of ISP, GoMP is of the view that the analogy also applies to the monitoring of environmental measures under ISP.

It is, therefore, requested that ESG may kindly consider Hon'ble High Court's order before discussing ISP in its 45<sup>th</sup> meeting.

We would like to reiterate our stand that GoMP has no objection to monitoring of the ISP by MoEF.

However, as desired complete Action Taken Report (including ISP) for 45<sup>th</sup> ESG meeting to be held on 24.04.2008 is enclosed for necessary action at your end.

- Encl : 1. Copy of Hon'ble High Court of MP  
 Jabalpur order dated 8.09.06  
 2. Action Taken Report of ISP and SRP.  
 in 2 copies

17.4.08  
 (Pradip Bhargava)  
 Vice Chairman  
 NVDA, Bhopal.

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## HIGH COURT OF MADHYA PRADESH AT JABALPUR

Writ Petition No.3022/2005Narmada Bachao Andolan..... PetitionerVersusNarmada Hydroelectric Development..... Respondents  
Corporation and others

For the petitioner : Miss Chitraroopa Palit (In person)

For the respondents: Mr.R.S.Prasad, Senior Advocate  
No.1 & 4 alongwith Mrs.Suparna Shrivastava,  
AdvocateFor the respondents: Mr.Mr.R.N.Singh, Advocate General,  
1, 3 and 4 and Mr.Arpan J. Pawar, AdvocateFor the respondents: Mr.Dharmendra Sharma, Assistant  
Nos. 5, 6 and 7(i) Solicitor alongwith Mr.Rajneesh  
to (vi) Upadhyay, Advocate

=====

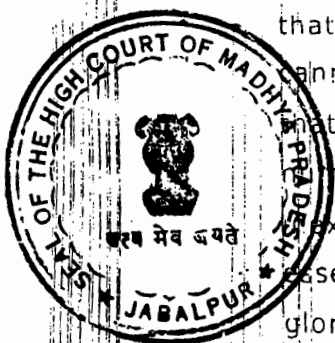
**Present: Hon'ble Mr.Justice Dipak Misra**  
**Hon'ble Mr.Justice Shantanu Kemkar**

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**ORDER**  
(08.09.2006)

**As per Dipak Misra, J:**

The present litigation, a public interest one, frescoes picture, paints a canvas and builds a pyramid to highlight that in a democratic welfare set-up, apathy and indifference cannot be shown or allowed to be projected on the bedrock that certain things are to happen for glow of life of a nation. It is a predicament to others and burying the value essentially of life, and to make them disappear in the glorification of economic progress, augmentation of electricity and proliferation of industry. To put it different the whole scenario pertains to raising of the water level



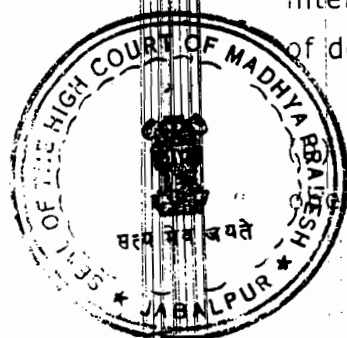
108. The next aspect in this regard is relatable to the availability of civic amenities at the shifted place. A place of shifting where human being is rehabilitated cannot be just a place. It has to have all the civil amenities. There has to be proper hygienic and clean atmosphere, place for imparting education and places where people can avail the medical facilities, etc.

109. Before we proceed to record our conclusions and issue directions we would like to state that there cannot be collective progression unless the people who suffer because of modernisation of economy are taken care of. It is the sacrosanct duty of the State. One cannot be oblivious of the fact that orderly growth is the bedrock of social justice. Any devise, however dynamic may be, has to keep in view the substratum of the conception of social justice, bridge the gap and accord justice to the weakest and the disabled. When so done the constitutional philosophy gets incremented. In the name of economic growth, no person should be degraded to become an unperson. A harmonious, delicate, pragmatic and humanitarian balance is to be struck. If the State, if we allow ourselves to say so, fails to do so, it creates a fundamental paradox and incorrect perceptual shift which the law does not counterance.

110. In the ultimate eventuate our conclusions and directions are enumerated in seriatim as under:-

(a) The present litigation is maintainable as a public interest one and not to be thrown overboard on the ground of delay and laches.

The orders passed in the earlier writ petitions do not operate as res judicata.



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(c) The award passed by the Narmada Water Disputes Tribunal is not applicable to the Indira Sagar Project except what has been stated therein and what has been clarified hereinbefore.

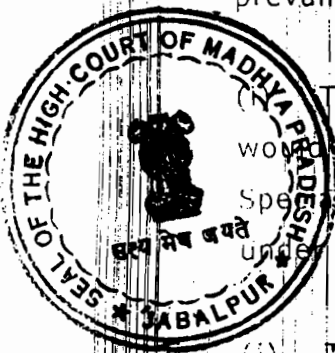
(d) The Narmada Control Authority has fundamentally no role vis-a-vis Indira Sagar Project. In any case the same has paleed and melted into insignificance because of the interlocutory orders passed by this Court from time to time ascribing the role to the said authority and the Sub-Group of the same.

(e) The awards passed by the Land Acquisition Officers are not nullities and have been passed by the competent officers under the Land Acquisition Act, 1894.

(f) The persons who have not filed the applications under Section 18 of the Land Acquisition Act seeking reference would be entitled to the benefit as engrafted under Section 28-A of the aforesaid Act.

(g) The policy evolved by the State Government from time to time is constitutionally valid.

(h) The Hindi version of letter dated 20.5.2000 would prevail and the same should be followed in letter and spirit.



(i) The adult sons and the adult unmarried daughters would be treated as separate units for grant of R&R and Special Rehabilitation Grant and other benefits provided under the policy.

(j) The encroachers who have been there prior to the cut off date shall be extended all the benefits under the policy.

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The State shall endeavour to create a further land bank to provide the benefit of land for land as far as possible.

(k) The persons who have not accepted the compensation in lieu of land would be at liberty to ask the authorities to grant land for land and the same shall be adhered to in terms of the policy;

(l) The sites which have been demarcated by the respondents No.1 and 2 should be developed so that the civic amenities are available and the oustees live with dignity.

(m) The persons who are aggrieved by the awards under the Land Acquisition Act can prosecute their grievances under the provisions of the said statute.

(n) The State Government would not advance a plea before the Civil Court that as the SRG has been granted there should be no enhancement of the award passed by the Land Acquisition Officer if the same is permissible within the parameters of said enactment.

✓ (o) The R&R group of Narmada Control Authority would do the field study and apprise the Grievance Redressal Authority with regard to the grievance of the affected persons.

(p) The Grievance Redressal Authority should be broad based by inducting a retired District Judge. Ordinarily we would have left it to the State Government, but we think it right to name Shri M.R. Kasania, a retired District Judge to be a Member of G.R.A.



(q) The Grievance Redressal Authority shall deal with the

22



W.P. 3022/2005 N B A V N  
B others

125.

grievances applications with utmost objectivity.

The Grievance Redressal Authority shall at least meet once a week in the affected area and do the needful which include the computation of R&R as well as SRG.

✓ (s) The order passed by the Grievance Redressal Authority shall be subject to judicial scrutiny of this Court.

(t) The Central Water Commission shall study further with regard to the persons and the houses which are likely to be affected by the back water level.

(u) The Grievance Redressal Authority and Central Water Commission would make close study whether the persons whose houses have been acquired barring the land whether it is justified or not, and if not so, recommend to the State Government for its appropriate decision.

(v) The oustees whose lands have not been acquired and, if not to be acquired, but lose their houses in the process acquisition should be given sites within the distance of 1 Km. along with the civic amenities relating to education, health and hygiene and other necessary facilities.

(w) The persons whose lands have been acquired to the extent of 75% and seek indulgence with regard to the balance 25% the same should be acquired and award should be passed.

(x) The pondage of the dam should be raised upto 260 metres in praesenti. Be it clarified, we do not say in regard to the height of the dam or the capacity of the reservoir. The capacity of the reservoir is 262.13 metres, but in praesenti we permit this much as certain rehabilitation

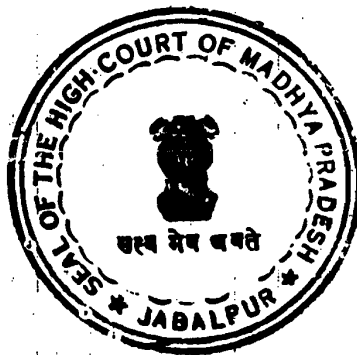


packages are yet to be carried out. The same shall be carried out by the respondents No.1 and 2 in quite promptitude with utmost objectivity in consultation with Grievance Redressal Authority and suggestions given by the Central Water Commission. We may further add the Central Water Commission, Grievance Redressal Authority and the respondents No.1 & 2 should evaluate the effect of the pondage on the backwater level and thereafter proceed pari passu with regard to raising of height of the water and rehabilitation programme.

111. Accordingly, the Writ Petition stands disposed of. Without any order as to costs.

*[Signature]*  
(Dipak Misra)  
JUDGE

*[Signature]*  
(Shantanu Kemkar)  
JUDGE



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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**छियालिसवीं बैठक की कार्यसूची**  
**Agenda for the 46<sup>th</sup> Meeting**

स्थान : पर्यावरण भवन, नई दिल्ली ।

Venue : Paryavaran Bhawan, New Delhi

दिनांक 20 जून, 2008 को 11.00 बजे पूर्वाह्न

Dated : 20<sup>th</sup> June, 2008 11.00 A.M.

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**INDORE**

**AGENDA FOR 46<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NARMADA CONTROL AUTHORITY ON 20<sup>TH</sup> JUNE, 2008  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

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**AGENDA FOR 46<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NARMADA CONTROL AUTHORITY ON 20<sup>TH</sup> JUNE, 2008  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

**Item No.XLVI-1(213) : CONFIRMATION OF MINUTES OF THE 45<sup>TH</sup>  
MEETING OF THE ENVIRONMENT SUB-GROUP**

The 45<sup>th</sup> Meeting of Environment Sub-Group (ESG) of the Namada Control Authority (NCA) was held on 24<sup>th</sup> April, 2008 at Paryavaran Bhawan, CGO Complex, New Delhi under the Chairpersonship of Ms. Meena Gupta, Secretary, Ministry of Environment and Forests (MoEF), Government of India. Minutes of the meeting were circulated to all members/invitees vide NCA office letter Env.4(45)/2008/1810-1850, dated 7<sup>th</sup> June, 2008.

**Comments, if any, received would be discussed during confirmation of the minutes.**

**Item No.XLVI-2(214) :     INDIRA SAGAR PROJECT – REVIEW OF THE  
                                  STATUS OF ENVIRONMENT SAFEGUARD  
                                  MEASURES**

During the 45<sup>th</sup> meeting, the representative of the Government of Madhya Pradesh (GOMP) desired that monitoring of the Indira Sagar Project (ISP) should not be done by the Environment Sub-Group. It was clarified by the Chairperson that environmental clearance by the MoEF was given on the condition that Narmada Control Authority (NCA) would ensure that Environmental Safeguard Measures are planned and implemented *pari-passu* with the progress of work on projects. These conditions could neither be modified nor withdrawn by the NCA or its Sub-Group. The Vice Chairman, NVDA, however indicated his desire to discuss this issue in NCA. Accordingly, GOMP has submitted an agenda item vide letter no. NVDA/M(E&F)/2008/804 dated 28/05/2008, which is being brought before the NCA during its next meeting.

The Chairperson, taking note of infringement of some of the conditions contained in the order of clearance, directed MoEF officials to take note for initiating suitable action in this regard. It was also decided that Forest Conservation Division of MoEF may be requested to expedite their decision on the request of GOMP to permit fishing in the part of ISP reservoir coming under reserve forest area.

Progress in the matter may please be presented by the MoEF.

**Item No.XLVI-3(215) : SARDAR SAROVAR PROJECT – REVIEW OF THE STATUS OF IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO FULL RESERVOIR LEVEL**

During the 45<sup>th</sup> meeting, the Environment Sub-Group had recommended construction of piers and overhead bridge but no installation of gates until further review. Party States also promised to take necessary steps expeditiously to remedy the deficiencies in the implementation of environment safeguards. It was also decided that the status of implementation of the Environment Safeguard Measures would be reviewed during next meeting.

Further, during the 45<sup>th</sup> meeting, the Chairperson had observed that there have been considerable differences in the status of progress presented by the NCA Secretariat and the progress being informed by the State Governments and that these issues could not be verified in such meetings and are required to be sorted out before convening meeting of the Environment Sub-Group with the party States. In pursuance, a meeting of all concerned has been convened on 12<sup>th</sup> June, 2008. Updated status will be presented for review during the meeting.

The present status of implementation of Environment Safeguard Measures and compliance to the conditions of environmental clearance are indicated below:

**(a) CATCHMENT AREA TREATMENT**

**a. Physical targets :**

<b>States</b>	<b>(Figures in ha.)</b>	
	<b>Phase-I (1,63,449)</b>	<b>Phase-II (3,73,325)</b>
Gujarat	29,157 (100%)	500 (100%)
Maharashtra	22,395 (100%)	29,043 (53%)
Madhya Pradesh	1,10,997 (100%)	50306 (15.8%)

### **b. Assessment of efficacy of treatment**

Assessment of efficacy of catchment area treatment includes forest cover assessment & silt monitoring. The present status is as under;

<b>States</b>	<b>Forest cover assessment</b>	<b>Silt monitoring</b>
Gujarat	Forest cover assessment is being done through GEER Foundation.	Silt monitoring is being done through CSWCR&TI.
Maharashtra	Forest cover assessment is being updated by FSI, Nagpur	Silt monitoring is being done through CSWCR&TI.
Madhya Pradesh	Conservator of Forests to revisit the areas.	One silt monitoring station has been set up. Another one is being set up.

### **c. Maintenance of treatment works**

Party States have reported that the maintenance of catchment area treatment works in forest areas are being taken care of respective Forest Departments and in non-forest areas, it is being done through private land owners or panchayats under different watershed programmes / rural development schemes.



**(b) COMPENSATORY PLANTATION:**

The status of compensatory plantation works is as under:

States	Physical Progress		Progress in notification under Forest Act 1927
	Target (Ha.)	Achievement (Ha.) (%)	
Gujarat	13950	13950 (100%)	96%
Madhya Pradesh	8737	8737 (100%)	89%
Maharashtra	19466	19378 (99%)	93%

**(c) COMMAND AREA DEVELOPMENT****Gujarat**

During the last meeting, it was decided that Government of Gujarat (GOG) officers would discuss the matter with NCA officers and expedite submission of revised CAD Plan. Accordingly, a team of GOG officers held discussion with NCA officers at Indore on 5-6 May, 2008.

GOG representative may apprise about progress in preparation of revised CAD Plan and implementation of environment safeguard measures.

**Rajasthan**

During the 45<sup>th</sup> Meeting of the Sub-Group, the representative of Government of Rajasthan (GoR) had informed that Wildlife Institute of India, ICMR, State Ground Water Board, WAPCOS, CAZRI, etc. are being involved in preparing the CAD Plan.

GoR representative may apprise about further progress made in preparation of CAD Plan and implementation of environment safeguard measures.

**(d) FLORA, FAUNA AND CARRYING CAPACITY**

**Terrestrial Environment :**

Key Issues		Gujarat	Maharashtra	Madhya Pradesh
Flora-fauna and carrying capacity	Rehabilitation of identified wildlife impacted by submergence.	Schoolpaneshwar sanctuary has been extended and developmental works are in progress. Biodiversity conservation plan in sanctuary areas is also in progress.	Plan for buffer zone plantations received and fully completed in one-third areas. 90% Preparatory works in balance areas have been completed. The works would be completed in the coming monsoon.	Draft EIA study report conducted by WII still under consideration of NVDA. GOMP may apprise the progress in preparation of plan and its implementation.
Preparation and execution of plans as per recommendation of EIA Studies.	Execution of plan on recommendations of EIA studies, before submergence.	Reported to be complied. GoG may submit compliance report as per EIA recommendations.	GOM may apprise the progress in preparation of plan and its implementation.	Social forestry plan has been completed.  60 Islands are proposed to be left undisturbed.  GoMP may submit compliance report as per EIA recommendations.

**Aquatic Environment :**

Key Issue		Gujarat	Maharashtra	Madhya Pradesh
Flora-fauna and carrying capacity (Fisheries/water quality)	Upgradation of the plan considering guidelines circulated by the HLEG.	MoU signed with CICFRI, studies to commence. Updated plan may be expedited.	Works commenced on CICFRI plan. Studies on organic loading received in NCA suggested that trophic burst is prolonging and should be utilized. Near absence of CO <sub>2</sub> thereby methane CH <sub>4</sub> gets eliminated. Plan being updated.	Action Plan suggested by CICFRI (1994) to safeguard the aquatic Environment yet to be taken up for updating/implementation.

	Stocking of the reservoir	Stocking continued.	Stocking to commence soon	Stocking started in 2007 and would be continued in this monsoon.
	Conservation measures implementation of the recommendations of CICFRI studies	It was reported in HLEG that tripartite agreement being put in place next year for further actions.	Agreed for tripartite agreement to ensure conservation of aquatic ecosystem, as recommended by HLEG.	The site for establishment of a Mahaseer Hatchery is under process. Director CIFA (ICAR) Bhubaneswar is being approached for technique to breed <u>Rita Pavimentata</u> .  Agreed for Joint fishing in principle in HLEG. The issue shall be discussed in NCA.

Further monitoring of compliance may be monitored by High Level Expert Group on Fisheries Development constituted by NCA in its 52<sup>nd</sup> meeting.

#### **Felling of trees before submergence :**

The status of felling of trees before submergence is as under :

States	Progress	
	Target	Achievement
Gujarat	4522 ha.	100% completed. Coppice crops removal completed upto El. 121.92m.
Madhya Pradesh	71867 nos.	69287 nos. (96.4%)
Maharashtra	6488 ha.	6461 ha. (99.6%)

#### **(e) SEISMICITY AND RIM STABILITY**

9 seismic monitoring stations along the periphery of the reservoir, 4 on either side and 1 at the downstream of Sardar Sarovar reservoir have been set up. Data from these monitoring stations are being regularly collected and put up before the Dam Safety Review Panel of Sardar Sarovar Project.

This matter has been taken as complied with in the 45<sup>th</sup> meeting.

**(f) HEALTH ASPECTS**

During the last meeting, it was decided that the Committee of Health Experts would revisit the areas and review the status of implementation of Health Aspects of Environmental Clearance. Accordingly, the Committee of Health Experts visited Maharashtra areas from 3<sup>rd</sup> to 5<sup>th</sup> June 2008. Representatives of the National Vector Control Research Institute of Indian Council of Medical research, National institute of Communicable Diseases, Indian Council of enteric Diseases, kolkata & representatives of the RCCF, MoEF, Bhopal besides Officers of NCA and experts of the Govt. of Maharashtra participated. Findings will be presented during the meeting.

The Health issues primarily concerns (i) Disease surveillance, (ii) regular monitoring of incidences of water borne diseases and (iii) health delivery system in the project areas both on preventive and curative fronts. Surveillance of water borne diseases are normally being carried out under Integrated Disease Surveillance Project (IDSP) and National Rural Health Mission (NHRM) of Govt. of India.

The status of implementation of health safeguards for the Sardar Sarovar Project area is as under:-

Action	Gujarat	Maharashtra	Madhya Pradesh
Baseline Studies	Completed	Completed	Completed
Preparation of State Action Plan – Health Aspects	Action plan updated for 2000-2001	Action Plan was submitted in 1993. A draft health action plan 2005-06 was also submitted	Action Plan was submitted in 1996. The plan is further revised in August 2003.
Health Survey	Routine surveillance activities are carried out regularly under IDSP or NHRM of Govt. of India.	Routine surveillance activities are carried out regularly under IDSP or NHRM of Govt. of India.	Routine surveillance activities are carried out regularly under IDSP or NHRM of Govt. of India.

Action	Gujarat	Maharashtra	Madhya Pradesh
Establishment of health facilities at Dam site/ Peripheral villages.	50 bed hospital at Kevadia including a malaria unit. Medical laboratory and 20 mobile units 61 dispensaries	Rural Hospital – 2 Primary Health Centres – 17 Primary Health Units – 5 Sub-Centers – 96 Floating dispensary – 10	1 Hospital, 1 mini PHC & 58 Dispensaries 30 bed hospital at Nisarpur completed and handed over to Health Department. Dharampuri Hospital being made functional. Provision of one Mobile Public Health laboratory has been made.
Vector control measures	Insecticidal spray Distribution of impregnated mosquito nets	Insecticidal spray Distribution of impregnated mosquito nets	Insecticidal spray Distribution of impregnated mosquito nets
Disease monitoring and responsibility	Entrusted to State Council of Health & Medical Services and EIA report has been submitted by SCHMS Bi-weekly visits of 182 sites by 20 mobile units. Referral services by expert team consisting of three medical specialist	Entrusted to State Health Department Surveillance studies had commenced and survey report for Phase-I of the study has been submitted by Topiwala National Medical College, Mumbai. Phase-II of study is under implementation by Govt. College, Dhule.	Gandhi Medical College, Bhopal was entrusted with epidemiological surveillance studies. Entrusted to Evaluation Cell established by NVDA, under subject matter Specialist

**(g) ARCHAEOLOGY AND ANTHROPOLOGY**

The action plan included following issues on archeology and anthropology;

- (i) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- (ii) Rehabilitation of monuments, wherever necessary

The current status of protection / relocation works is as under;

	Gujarat	Maharashtra	Madhya Pradesh
Monuments	2 (completed)	Nil	Completed. GoMP assured no approach shall be impacted.
Mounds	Nil	Nil	Completed
Museums/Parks	Nil	Nil	3 completed, 1 in progress

**(h) ENVIRONMENT MANAGEMENT OF DOWNSTREAM AREA**

GOG accepted recommendations of HR Wallingford and informed to Sub-Group to implement the measures suggested therein. GOG representative may apprise about the progress in preparation and implementation of Downstream Environment Management Plan.

Report on modified ecological regime in downstream area may be presented by Gujarat.

In view of the status presented above, members may like to review the progress in compliance of the conditions of environmental clearance and take appropriate decision about further raising of the Sardar Sarovar Dam.

**Item No.XLVI-4(216) : ANY OTHER ITEM**

**DATE AND TIME OF THE NEXT MEETING**



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**पर्यावरण उपदल**  
**ENVIRONMENT SUB-GROUP**

**छियालिसवीं बैठक का कार्यवृत्त**  
**Minutes of the 46<sup>th</sup> Meeting**

**20 जून, 2008 को**  
**पर्यावरण भवन, नई दिल्ली में हुई**  
**Held at Paryavaran Bhavan, New Delhi on 20<sup>th</sup> June, 2008**

**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**

**इन्दौर**  
**जुलाई, 2008**  
**INDORE**  
**July, 2008**

MINUTES OF THE 46<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP

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XLVI(1)	List of participants.	9
XLVI(2)	Narmada Valley Development Authority, letter No. NVDA/E&F/Tec/2008/903 dated 17.06.08	11



**MINUTES OF THE 46<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF THE  
NARMADA CONTROL AUTHORITY HELD ON 20<sup>th</sup> JUNE, 2008  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

The 46<sup>th</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held on 20<sup>th</sup> June, 2008 at Paryavaran Bhawan, CGO Complex, New Delhi under the Chairpersonship of Ms. Meena Gupta, Secretary, Ministry of Environment & Forests (MoEF), Govt of India.

List of participants is enclosed at Annexure-XLVI-Min-(1).

The Chairperson, at the outset, welcomed all participants to the meeting and thereafter, requested the Executive Member, NCA to present the agenda items for discussions.

**Item No. XLVI-1(213): CONFIRMATION OF MINUTES OF THE 45<sup>TH</sup> MEETING OF  
THE ENVIRONMENT SUB-GROUP.**

Minutes of 45<sup>th</sup> Meeting of Environment Sub-Group of Narmada Control Authority held on 24<sup>th</sup> April, 2008, were circulated to all Members and Invitees vide Narmada Control Authority office letter No.Env-4(45)2008/1810-1850 dated 7<sup>th</sup> June 2008.

Narmada Valley Development Authority, vide letter No. NVDA/E&F/Tec/2008/903 dated 17.06.08 placed at Annexure-XLVI-Min-(2), sought modifications in the minutes.

The Sub-group discussed the issues brought out by the above referred letter and decided as under:

1. **Item No. XLV-2 (206): Page 4 , fourth Para,** Addition of the following at the end of the para....  
 ".....The Chairperson, further stated that, GoMP if so desire, may take the matter to NCA for clarification on the issue of monitoring of ISP by ESG."
2. **Item No. XLV-2(206), Page 5, third Para seventh line** substitution of the following line  
 ".....the EIA Study group for Indira Sagar Project, key aquatic species including fishes/otters and other rare, endangered wildlife, eutrophication, emission of green house gases, etc.", with the following :-  
 ".....and concerns on other issues like eutrophication, emission of green house gases, etc. expressed by other study reports / Environment Sub-group from time to time.
3. **Item No. XLV-3 (207): Page 6, first para of (a) :** Addition at the end of the para of the following.  
 "The time frame would be reviewed, if necessary, after decision on cost sharing".
4. **Item No. XLV-3(207) B.(a) Page 7 first para:** "The word "Phase-II" is deleted.
5. **Item No. XLV-3(207) B.(a) Page 7: para-4 :** The word "recommendations on " to be added after the words "regard to"
6. **Item No. XLV-3(207) B.(f) Page 11:** The following para is deleted:-  
 "Director (Environment), NCA informed that during the meeting held with certain Project Affected Persons on 26.03.08, the Chairperson has directed that Expert Committee on Health should re-visit the areas and submit its findings."
7. **Item No. XLV-5(209) :** The words "to recommend" to be added after the word "...decided..."

Minutes were confirmed with above modifications.

**Item No. XLVI-2(214): INDIRA SAGAR PROJECT: REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

The sub-group was informed that GoMP has submitted an agenda item for the NCA seeking clarifications on the issue of monitoring of Indira Sagar Project by Environment sub-group.

Regarding infringement by GoMP of some of the conditions contained in the order of clearance given by M.E.F. to Indira Sagar Project and the request of GoMP to permit fishing in the part of ISP reservoir coming under reserve forest area it was informed that follow-up action is being taken by MoEF.

The Vice Chairman, NVDA, further, informed that the environmental clearance of 1987 was essentially administrative in nature, as observed by the Hon'ble Supreme Court in its majority judgement dated 18<sup>th</sup> October 2000 in Writ Petition (Civil) No. 319 of 1994. He also requested that this aspect may be looked into by the Chairperson. Shri Shekhar Singh pointed out that the above clearance was backed by statute, hence, acquired statutory character and could not be infringed.

**Item No. XLVI-3(115): SARDAR SAROVAR PROJECT: REVIEW OF THE STATUS OF IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO FULL RESERVOIR LEVEL.**

The Chairperson opened the discussions by saying that during the last meeting the Sub-group had recommended construction of piers and over head Bridge but no installation of gates until further review. Construction of piers and over head Bridge will cause additional submergence of 1.62 meters which is not insignificant. The decision needs to be reviewed in view of this. The Vice Chairman, NVDA was of the view that the decision allowing construction was taken after full consideration of the facts and decision should not be allowed to be reviewed.

The Chairperson, thereafter, asked the Executive Member, NCA to present the status of implementation of Environment Safeguard Measures to assess the progress made by the Party States.

The Executive Member, NCA informed that as per the directions of the Chairperson, a meeting to reconcile the status of implementation of environment safeguard measures was convened on 12.06.2008, which was attended by representatives of Gujarat & Madhya Pradesh. Representatives of Maharashtra and Rajasthan could not attend the same. He informed that agenda notes reflect the reconciled status of implementation as arrived at on 12.06.2008.

Regarding creation of two Sanctuaries proposed in the report of State Forest Research Institute, the area of which is already submerged, Vice Chairman, NVDA stated that NVDA will provide financial support, if forest department in future decide to set up a Sanctuary, Shri Shekhar Singh however stated that sanctuary has to be established before commencement of submergence and therefore unless environment safeguard measures are duly complied, permission cannot be considered.

Shri Shekhar Singh also stated that in the absence of details regarding felling of trees in the forest and non forest areas in terms of estimate of number of trees either in the agenda or in the discussion, it cannot be claimed that felling has been completed.

In order to prepare the Environment management plan downstream of Sardar Sarovar Dam Gujarat has initiated various studies. Thereafter, Party States intimated following additional progress.

**Madhya Pradesh** : The Vice Chairman, Narmada Valley Development Authority informed that

- The NVDA have entrusted studies on assessment of efficacy of the Catchment Area Treatment to Forest Survey of India, Dehradun. Studies are likely to commence soon.
- The NVDA has decided to set up Kathiwada Sanctuary as recommended by Wildlife Institute of India. It has also agreed to meet expenditure on notification of Wildlife Sanctuary by Forest Department
- As per NVDA decision, only one Museum is to be established, which has been completed.

**Gujarat** : The Joint M.D., Sardar Sarovar Narmada Nigam Ltd. informed that

- The plan for Command Area was submitted earlier. However, in pursuance to the discussions of the last meeting of ESG, a team of SSNNL officers visited the NCA office recently for ascertaining gaps in the plan submitted during 2007. The plan except for issues related to drainage, is nearly complete and shall be submitted soon.
- Downstream management plan could be prepared after completion of the following studies initiated recently.
  - i) Morphological studies for River Narmada from Sardar Sarovar Dam to Bharuch.
  - ii) Mathematical Model studies for routing of flows in River Narmada.
  - iii) Mathematical Model studies for Assessment of water quality of Sardar Sarovar Reservoir.

- iv) Impact on ecology and fisheries in the downstream of Sardar Sarovar Reservoir.

These studies are likely to be completed within six to twelve months. Thereafter, downstream management plan would be prepared.

**Rajasthan :** The Chief Engineer, Narmada Canal Project : informed that water was released to Rajasthan on 20<sup>th</sup> March, 2008, Modifications of the Command Area Development Plan as per suggestions of the Environment Sub-group of NCA is being carried out with the help of Wildlife Institute of India, Indian Council of Medical Research & WAPCOS. He stated, that final plan would be prepared within a year.

As per the reconciled status Chairperson observed that there has been little progress in the implementation of Environmental Safeguards measures for Sardar Sarovar Project.

She further observed that additional submergence of 1.62 meter due to construction of piers, is substantial and its impact needs to be looked into. The Managing Director, SSNNL explained that level of submergence has been studied by Central Water Commission. The construction would require a period of 30 months to complete. The Chairperson directed that construction of the piers / overhead bridge should be put on hold until the implementation of the requisite plans for addressing Environmental Safeguard Measures are assessed w.r.t. conditions contained in the order of clearance in the field and reviewed by the Environment Sub-group. She further directed to constitute a Committee by the Ministry of Environment and Forest for independent assessment which will assess the same and submit its report within three months for impacts of construction of piers and overhead bridge and w.r.t. permission for raising dam height upto FRL, the report could be submitted within 6 to 9 months time. The report, thereafter, would be reviewed by the Environment Sub-group before permitting any further construction.

Shri B.G. Varghese , stated that in order to avoid cost over runs and also to derive the benefits from the projects, it would be desirable to complete the project expeditiously. Requirement on Environmental issues should also be addressed appropriately, in time.

Dr. Shekhar Singh, stated that status of compliances with the conditions contained in the order of clearance, is required to be ascertained w.r.t. stipulations contained in the order of clearance for both Sardar Sarovar & Indira Sagar Projects before giving any further permission for construction. He pointed out that many of the measures required to be under-taken in advance of commencement of the submergence are yet to be planned / implemented. He stated that implementation of the Catchment Area Treatment of Phase-II, notification of the Non-forest areas as forest, felling of trees from the forest / non forest areas, notification of the sanctuary areas to compensate / rehabilitate the wildlife impacted by submergence, preparation & implementation of the plan for Command Area and Environmental Management Plan of downstream areas in Gujarat are not yet fully presented to the Sub-group. He agreed with the decision of the Chairperson to constitute a Committee for assessment and verification of the status of implementation of the Environment Safeguard Measures.

The Chairperson summed up the discussions by stating that a stage has reached where in Project Authorities are seeking permission for raising the dam height to the full reservoir level. Therefore a necessity is felt for examination of the level of compliance on Environment Safeguard Measures commensurate with construction activities on the project, which were stipulated in the clearances given by the Central Govt(s). The proposed Committee will carry out field verification for assessment of the implementation of Environmental Safeguard Measures undertaken by the Project Authorities. The representative, of the State Govt (s), would also be associated, during assessment works pertaining to concerned State. The constitution of the Committee and its Terms of References would be decided separately.

**Item No. XLVI-4(116): Any other item.**

Dr. Shamsheer Singh, Ministry of Agriculture, Govt. of India sought to clarify, the issues raised by Govt. of Madhya Pradesh, during the last meeting, regarding additional funding by the Govt. of India under Macro Management mode for treatment of Catchment Area of Narmada River basin. He stated that Macro-Management mode included 17 different schemes, of which Catchment Area Treatment is one. The funds for catchment area treatment activities are allotted by the State Govt. themselves. The allotment of Narmada River Catchment was about Rs. 3 crores last year, which is enhanced to about Rs. 7 crores this year. Ministry of Agriculture, considering the importance of Narmada basin has increased funding to Govt. of Madhya Pradesh from Rs. 14 crores last year to Rs. 22 crores this year. He, however, clarified that towards the end of financial year, if there is any saving, under the Macro management mode, Ministry of Agriculture could provide additional funding, provided such requests comes from the State Govt(s) concerned.

The meeting ended with a vote of thanks to the Chair.



# ANNEXURES

**ANNEX-XLVI-Min-(1)**

**LIST OF PARTICIPANTS OF THE 46<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 20<sup>th</sup> June, 2008 AT PARYAVARAN BHAWAN, NEW DELHI.**

**Ministry of Environment & Forests, New Delhi**

1. Ms. Meena Gupta, Secretary, MOEF, New Delhi.
2. Shri B.N. Mohanty, CCF, Regional MoEF, Bhopal.
3. Dr. S. Bhowmik, Addl. Director, MOEF, New Delhi.

**Narmada Control Authority**

1. Shri V.K.Jyothi, Executive Member, NCA, Indore
2. Shri M.K.Sinha, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore

**Ministry of Water Resources, New Delhi.**

1. Shri Indra Raj, Commissioner (Project), MoWR, New Delhi.

**National Institute of Communicable Diseases, New Delhi.**

1. Dr. P. Khasnobis,

**Sardar Sarovar Construction Advisory Committee**

2. Shri Nirmal Jot Singh, Secretary, SSCAC, Vadodara

**Archaeological Survey of India, New Delhi.**

1. Shri S.B. Ota, Director, Archaeological Survey of India, Janpath, New Delhi.

**Botanical Survey of India**

1. Dr. K.P. Singh, Addl. Director, B.S.I., Allahabad.

**Expert Members**

1. Dr. Shekhar Singh, Expert Member, New Delhi
2. Prof. R.K Katti Expert Member, Mumbai..
3. Dr. B.G. Verghese, Expert Member, New Delhi.

**GOVERNMENT OF GUJARAT**

1. Shri A.K. Joti, M.D., SSNNL, Gandhinagar.
2. Shri R.K. Tripathi, Jt. M.D. S.S.N.N.L., SSNNL.
3. Dr. S.D. Vora, Conservator of Forests, SSNNL, G'Nagar..

**GOVERNMENT OF MADHYA PRADESH**

1. Shri Pradip Bhargava, Vice Chairman, N.V.D.A., Bhopal.
2. Shri L.K.Sood, C.C.F., NVDA, Bhopal
3. Dr. B.N. Nagpal, Dy. Director, National Institute of Malaria Research. 20 Madhuban, Delhi.

**GOVERNMENT OF MAHARASHTRA**

1. Shri S.L. Goyal, Secretary (Environment), Govt. of Maharashtra.
2. Shri A.K. Nigam, Chief Conservator of Forests (T), Dhule, GoM.

**GOVERNMENT OF RAJASTHAN**

1. Shri Sankatha Prasad, Addl. Secretary, Environment Department, GoR.
2. Shri N.R. Rai, Chief Engineer, N.C.P. Sanchoe,
3. Shri H.R. Shrimal, SE, Narmada -II, Sanchoe, Rajasthan.
4. Shri Shankar Singh, Addl. Commissioner (NRM), GoR.

**ANNEX-XLVI-Min-(2)**

**Narmada Valley Development Authority**  
**59, Narmada Bhawan, Arera Hills, Jail Road, Bhopal-462011**  
 No. NVDA/E&F/Tec./2008/903 Bhopal, Dated: 17.06.08

To,

**Member/Secretary,  
 Environment Sub-group,  
 Narmada Control Authority,  
 Narmada Sadan, Sector B,  
 Scheme No. 74, Vijay Nagar,  
 Indore - 452010 (M.P.)**

Sub. : - Minutes of the 45<sup>th</sup> meeting of the Environment Sub-group.  
 Ref.: - Your letter no. Env-3 (45)2008/1810-1850 dated 07.06.08

Sir,

This has reference to the minutes recorded for Madhya Pradesh under following items and modification in minutes are proposed as follows :-

**Item No. XLV-2 (206): INDIRA SAGAR PROJECT: REVIEW OF THE  
 STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

(1) In fourth Para on page 4 it has been recorded "Chairperson stated that the Clearance from Environmental angle by the Ministry of Environment & Forests to the Sardar Sarovar and Narmada Sagar (later-on renamed as Indira Sagar) Projects was given on the condition that Narmada Control Authority would ensure that the Environmental Safeguard Measures are planned and implemented *pari-passu* with the progress of work on the projects. These conditions could neither be modified nor withdrawn by the NCA or its Sub Groups."

On the issue Chairman had further said that GoMP if so desire may take the matter to NCA for decision on the issue of monitoring of ISP by ESG. It is, therefore, requested to add following line in fourth Para on page 4 and fourth Para page 4 should read as follows:

"Chairperson stated that the Clearance from Environmental angle by the Ministry of Environment & Forests to the Sardar Sarovar and Narmada Sagar (later-on renamed as Indira Sagar) Projects was given on the condition that Narmada Control Authority would ensure that the Environmental Safeguard Measures are planned and implemented *pari-passu* with the progress of work on the projects. These conditions could neither be modified nor withdrawn by the NCA or its Sub Groups. Chairman further stated that GoMP if so desire may take the matter to NCA for decision on the issue of monitoring of ISP by ESG."

(2) In third Para on page 5 in seventh line words "eutrophication, emission of green house gases, etc." had been inserted although EIA study of WII had not mentioned the same. It is, therefore, requested, that phrase "eutrophication, emission of green house gases, etc." shall be deleted from third Para on page 5 and this Para should read as:

"Based on the status as brought out in the Agenda Notes on survey, studies & implementation of the Environmental Safeguard Measures indicating infringement of the conditions contained in the order of clearance on key areas of concern specially protection to the wildlife from the submergence area, as suggested by the Wildlife Institute of India, the EIA Study group for Indira Sagar Project, key aquatic species including fishes/otters and other rare, endangered wildlife, the Chairperson, directed MoEF official to take note for initiating suitable action in this regard."

**Item No. XLV-3 (207): SARDAR SAROVAR PROJECT:**

**B) REVIEW OF THE STATUS OF ENVIRONMENT SAFEGUARD MEASURES.**

**(a) CATCHMENT AREA TREATMENT: -**

(1) In first Para it has been stated that "Remaining area of Phase-II in Maharashtra and Madhya Pradesh should be completed during next 5/6 years' time". It is requested that the issue of sharing of cost on CAT should be decided before setting up any time limit for CAT in Phase II area. It is, therefore, essential that phrase "Remaining area of Phase-II in Maharashtra and Madhya Pradesh should be completed during next 5/6 years' time" shall be deleted from this Para and it should read as follows: -

~~The Sub-Group reviewed the status as presented in the Agenda Notes. CAT works in Phase-I area has almost been completed. Phase II area has been treated fully in Gujarat. The treatment of phase II area in MP and Maharashtra is in progress.~~

(2) In first Para on page 7 it has been mentioned, "Additional Director, MoEF pointed out that in the same order, it was also mentioned that Ministry of Environment & Forests would decide as to how much of the Phase-II area will have to be treated pari-passu." It is to be pointed out that in decision of Committee of Secretaries dated 08.07.1992, treatment of PHASE II area pari-passu had not been mentioned and as such these lines should be deleted from minutes. Accordingly first para on page 7 should read as follows-

~~The Vice Chairman, NVDA referred to the decision of Committee of Secretaries dated 08.07.1992 which suggested that major irrigation projects are not to be loaded with CAT expenditure on freely draining areas.~~

(3) In fourth Para in page 7 it has been said, "The Chairperson stated that decisions have already been taken with regard to charging and sharing of cost of CAT works". It needs to be mentioned that in 12<sup>th</sup> meeting of RC NCA the matter for cost sharing had been referred to ESG for advice and ESG had no authority to decide the issue. In fact in minutes of meeting of 16<sup>th</sup> April 2008, the sub group had only decided to recommend to NCA/RCNCA. It is, therefore, essential that phrase that "The Chairperson stated that decisions have already been taken with regard to charging and sharing of cost of CAT works" is deleted from this Para and fourth Para on page 7 should read as follows: -

~~"Regarding funding under Macro Management mode, as the issue pertains to Ministry of Agriculture, it would be referred to them."~~

**(f) Health Aspect**

(1) In second Para it is mentioned that "Director (Environment), NCA informed that during the meeting held with certain Project Affected Persons on 26.03.08, the Chairperson has directed that Expert Committee on Health should re-visit the areas and submit its findings." In this it is necessary to point out that there was no such decision in the ESG

meeting on 21.04.08 that Expert Committee on Health should re-visit the areas and submit its findings. It is, therefore, necessary that phrase that "Director (Environment), NCA informed that during the meeting held with certain Project Affected Persons on 26.03.08, the Chairperson has directed that Expert Committee on Health should re-visit the areas and submit its findings." is deleted from the minutes and second Para should read as follows: -

**"The copies of the representation received from MoE&F would also be forwarded to the concerned State Governments for their comments and further necessary action."**

(2) In the third Para it is mentioned that "The Sub-Group felt that this aspect including review of the status of implementation of Health Aspects should be carried out by the Committee of Health Experts". In view of fact that no discussion on visit of Health committee took place in 45<sup>th</sup> meeting, this phrase is to be deleted from the minutes and third Para should read as follows: -

**"Thereafter, some discussions took place with regard to the format of monitoring of water borne diseases."**

**Item No.XLV-5 (209) - SHARING THE COST OF THE TREATMENT OF FREELY DRAINING CRITICALLY ERODED CATCHMENT AREA**

**In second Para it is mentioned that**

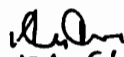
**"After detailed deliberation, it has been decided in the said meeting that cost of treating critically degraded sub-watersheds in the free draining catchments, including both Phase - I (directly draining) and Phase - II (other than directly draining) shall be treated at the project cost and provided for under Unit - I (dam and appurtenant works) and shared in the ratio of the costs charged to Unit-I amongst the party States (Gujarat = 51%, Madhya Pradesh = 32%, Maharashtra = 15% and Rajasthan = 2%)".**

Here again it is to be pointed out that ESG had no authority to decide the issue of sharing of cost on CAT as ESG had been given the task to advice NCA on the issue. Further in the said meeting GoMP had clearly not agreed to the cost sharing formula as mentioned above and the same had also been mentioned in minutes of said meeting. In view of this the second Para needs to be deleted.

**It is, therefore, requested that minutes of 45<sup>th</sup> meeting be modified as suggested above.**

Thanking you,

Yours faithfully,

  
17/06/2008

(A. K. DUBEY)

**Member Environment & Forest  
Narmada Valley Development Authority  
BHOPAL**

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## पर्यावरण उपदल ENVIRONMENT SUB-GROUP

### सैंतालसवीं बैठक की कार्यसूची Agenda for the 47th Meeting

स्थान : पर्यावरण भवन, नई दिल्ली।  
Venue : Paryavaran Bhawan, New Delhi

दिनांक : 22 फरवरी, 2010 को 11 बजे पूरवाहन  
Dated : 22nd February, 2010 at 11.00 A.M.

नर्मदा नियंत्रण प्राधिकरण  
Narmada Control Authority

इन्दौर  
INDORE



# नर्मदा नियंत्रण प्राधिकरण NARMADA CONTROL AUTHORITY

(Ministry of Water Resources, Govt. of India)

सं. पर्यावरण-3(47)/2010/25-55

दिनांक : 15.02.2010

सेवा में,

न.नि.प्रा. के पर्यावरण उपदल के सभी सदस्य/आमंत्रितगण,  
संलग्न सूची के अनुसार।

विषय: नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 47वीं बैठक के सम्बन्ध में।

महोदय,

दिनांक 22.02.2010 को 11.00 बजे पूरवाहन में समिति कक्ष सं. 403, पर्यावरण भवन, लोधी रोड़, नई दिल्ली में आयोजित होने वाली नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 47 वीं बैठक की कार्यसूची संलग्न है।

आपसे उपरोक्त बैठक में भाग लेने के सविनय अनुरोध सहित।

भवदीय

(मुकेश कुमार सिन्हा)  
सदस्य (पर्यावरण एवं पुर्नवास)

प्रतिलिपि सूचनार्थ प्रेषित:

1. सचिव, जल संसाधन मंत्रालय एवं अध्यक्ष, न.नि.प्रा. भारत सरकार, श्रम शक्ति भवन, रफी मार्ग, नई दिल्ली-110 001
2. मुख्य सचिव, मध्यप्रदेश शासन, वल्लभ भवन, भोपाल।
3. मुख्य सचिव, महाराष्ट्र शासन, मंत्रालय, मुम्बई।
4. मुख्य सचिव, राजस्थान शासन, सचिवालय, जयपुर।
5. मुख्य सचिव, गुजरात शासन, सचिवालय, गॉधीनगर।

(मुकेश कुमार सिन्हा)  
सदस्य (पर्यावरण एवं पुर्नवास)



**AGENDA FOR 47<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NARMADA CONTROL AUTHORITY  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

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**AGENDA FOR 47<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NARMADA CONTROL AUTHORITY  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

**Item No. XLVII-1(217): CONFIRMATION OF MINUTES OF THE 46<sup>TH</sup> MEETING OF  
THE ENVIRONMENT SUB-GROUP**

The 46<sup>th</sup> Meeting of Environment Sub-Group (ESG) of the Narmada Control Authority (NCA) was held on 20<sup>th</sup> June, 2008 at Paryavaran Bhawan, CGO Complex, New Delhi under the Chairpersonship of Ms. Meena Gupta, Secretary, Ministry of Environment and Forests (MoEF), Government of India. Minutes of the meeting were circulated to all members/invitees vide NCA office letter Env.3(46)/2008/2439-2479, dated 10.07.08.

Giving references to NVDA D.O. letter nos. 1363 dated 8/7/08, 12 dated 18/7/08 addressed to the Executive Member, NCA and 174/PS/VC/NVDA dated 21/10/08 addressed to the Secretary (Water Resources), GoMP vide letter no. E&R/Tech./09/605 dated 29/4/09 (**Annexure XLVII- 1**) has proposed addition of following paragraph at the end of page 6 under Item No. XLVI-3(115);

*"Vice Chairman, NVDA said that in the 45<sup>th</sup> meeting of ESG dated 24.04.08, it was unanimously decided to recommend construction of piers and overhead bridge, but no installation of crest gates until further review. It will be seen that this decision was taken after noting that additional submergence due to the piers and the bridge would be 1.62 meters. Further, the decision in the 45<sup>th</sup> meeting was taken unanimously by the Sub Group while decision that construction of the piers/overhead bridge should be put on hold is not unanimous and participatory States do not agree to this. Thus the decision taken in the 45<sup>th</sup> meeting of ESG cannot be unilaterally changed in the 46<sup>th</sup> meeting by one of the members (or Chairman) of ESG.*

*It was also pointed out that NCA had been monitoring the progress of environmental safeguard measures of Sardar Sarovar Project by its Sub Committee, therefore, there is no need for ESG to take a decision to constitute a committee by MoEF on the issue."*

The issues raised by GoMP vide NVDA D.O. letter nos. 1363 dated 8/7/08, 12 dated 18/7/08 addressed to the Executive Member, NCA were brought out before the 80th meeting of NCA held on 12.08.08, wherein it was decided that the issue of framing of rules of business may be left to the Chairperson of the Sub-group and the composition of the sub-group may also be periodically reviewed.

*Why here?*

1. Not in agenda
2. Wrong basis - asserted that there was no additional submergence.
3. Wrong practice - not majority - otherwise project authority will always be majority.
4. Even SC has held that decision can be reviewed if based on wrong facts / basis.

GoG vide letter no. SSNL/ENV/ESG/47/460/2009 dated April 9, 2009 (**Annexure XLVII- 2**) has pointed out the omissions in the minutes as under;

- X 1. The party States did not agree with the formation of the Committee.
- ? 2. Govt. of Gujarat requested to provide information with regards to the calculation of 1.62mt additional submergence.
- X 3. The discussion to form a Committee was with respect to 1.62mt additional submergence only, and not with respect to FRL.
4. The time frame considered in the meeting for the committee was for the period of three months only and not 6-9 month as minuted.
5. Letter written in this regard by M.D. SSNL on 28<sup>th</sup> July, 2008 (Copy enclosed) may also be taken into consideration.

*only for  
back water*

*after the meeting*

7 | The issue regarding constitution of Committee by MoEF was also brought out before the 80th meeting of NCA held on 12.08.08, wherein it was decided to refer the issue of constitution of the Committee by MOEF to the Environment Sub-Group which will consider the issues raised by the NCA Secretariat and the party States in this regard. This matter has been brought out separately.

No further comment has been received from other members / party States.

The Sub Group may like to deliberate and decide about confirmation of the minutes.

**Item No.XLVII-2(218) : PRESENTATION OF THE REPORT BY THE COMMITTEE BY  
MINISTRY OF ENVIRONMENT & FORESTS FOR  
ASSESSMENT OF SURVEY/ STUDIES/PLANNING AND  
IMPLEMENTATION OF THE PLANS ON ENVIRONMENT  
SAFEGUARD MEASURES FOR SARDAR SAROVAR &  
INDIRA SAGAR PROJECTS**

**(A) SETTING UP OF THE MoEF COMMITTEE**

The status of implementation of the environmental safeguard measures commensurate with dam height of El 121.92 m and beyond was reviewed in the 46<sup>th</sup> meeting of ESG and it was recorded that

*"Chairperson observed that there has been little progress in the implementation of Environmental Safeguard measures for Sardar Sarovar Project. She further observed that additional submergence of 1.62 meter due to construction of piers, is substantial and its impact needs to be looked into. The Managing Director, SSNNL explained that level of submergence has been studied by Central Water Commission. The construction would require a period of 30 months to complete. The Chairperson directed that construction of the piers/overhead bridge should be put on hold until the implementation of the requisite plans for addressing Environmental Safeguard Measures are assessed with reference to conditions contained in the order of clearance in the field and reviewed by the Environment Sub-Group. She further directed to constitute a Committee by the Ministry of Environment and Forest (MoEF) for independent assessment which will assess the same and submit its report within three months for impacts of construction of piers and overhead bridge and with reference to permission for raising dam height upto FRL, the report could be submitted within 6 to 9 months time. The report, thereafter, would be reviewed by the Environment Sub Group before permitting any further construction."*

In pursuance, Ministry of Environment & Forests (MoEF) vide O.M. No. 3-87/80-IA-I dated 09.07.2008 (modified on 02.09.2008, copy enclosed as **Annexure XLVII- 3**) has constituted a Committee for assessment of Survey/ Studies/Planning and implementation of the plans on Environment Safeguard Measures for Sardar Sarovar & Indira Sagar Projects. Dr. Devender Pandey, then Director General, Forest Survey of India, Dehradun has been made the Chairman of the said Committee with the Chief Conservator of Forests, Regional Office, MoEF, Bhopal as the Member Secretary. The Terms of Reference were;

- (i) The committee would examine adequacy of the survey/studies/ planning/implementation and monitoring of the required plans in the light of the relevant provisions contained in the NWDT Award from environmental angle and/or conditions contained in the order of clearance issued to the SSP and ISP by the MoEF and clarifications/ assurances given by the project authorities while seeking clearances. The Committee would also focus on the issues brought out by the

members of the Environment Sub-Group from time to time and would make appropriate recommendations on the assessment of compliances.

- (ii) The committee shall meet as often as necessary and shall also undertake field visit to the areas, during reviews of the plan/implementation. The committee will interact with officers/experts of SSNNL/NVDA/Concerned organizations of Rajasthan and Maharashtra for appraisal/assessment. The committee would also consider constraints and compulsions of the executing agencies, views of the inhabitants of the impacted areas.
- (iii) Initially the committee is expected to undertake assessment work relating to mitigation of impacts generated by raising of the piers and overhead bridge of Sardar Sarovar Project within 3 months time. After assessing the report, tenure of the committee would be renewed if considered necessary.
- (iv) The committee could use the modern technologies and data bank in their work and would also review/develop indicators and mechanism for long term monitoring of implementation of the plans on parameters like command area/downstream and conservation of aquatic system, within the ambit of the order of clearance/responsibilities entrusted to the Environment Sub Group.

The issue of setting up of a Committee by MoEF for assessment of Survey/Studies/Planning and implementation of the plans on Environment Safeguard Measures was discussed in the 80th meeting of NCA. The major reservations expressed by party States & NCA Secretariat were;

- (i) The Terms of Reference notified by MOEF exceeded the decision taken in the ESG, like examination of adequacy of survey/studies/ planning/implementation and monitoring making it an unending process, inclusion of Indira Sagar Project, etc.

- (ii) The Members of Environment Sub-Group should not be included in the Committee.

- (iii) The Terms of Reference of the Committee is similar to the existing Environment Committee constituted by NCA.

- (iv) The observations of the Hon'ble Supreme Court in its order dated 18.10.2000 in Writ Petition (Civil) No.319 of 1994 that

*"There is no reason whatsoever as to why independent experts should be required to examine the quality, accuracy, recommendations and implementation of the studies carried out. The Narmada Control Authority and the Environment Sub-group in particular have the advantage of having with them the studies which had been carried out and there is no reason to believe that they would not be able to handle any problem, if and when, it arises or to doubt the correctness of the studies made."*

*when?  
where?  
are they  
what kind  
happened?*

*only CAD??  
& that also  
quality of CAD*

Accordingly, the Authority decided to refer the issue of constitution of the Committee by MOEF to the Environment Sub-Group which will consider the issues raised by the NCA Secretariat and the party States in this regard. The relevant agenda & minutes of the 80<sup>th</sup> meeting of NCA is enclosed as **Annexure XLVII- 4 & 5** respectively.

The Committee was initially required to submit its report within 3 months' time, but has been granted time extension till 30th November, 2010.

#### **(B) INTERIM REPORT DATED 13.02.09 OF THE MoEF COMMITTEE**

The Committee has submitted an interim report on 13.2.09 (**Annexure XLVII- 6**), which was forwarded by MoEF to the Chairman, NCA on 05.03.09. In this report, the Committee has made certain observation on the backwater and afflux level studies. These have been clarified/ replied to by NCA Secretariat to MoWR vide letter no. NCA/M(E&R)/08-09/385 dated 24.03.09 **Annexure XLVII-7**. The GoMP has also sent its comments vide letter no. 825/384/NVDA/E/W/08 dated 13.04.09 (**Annexure XLVII-8**). Subsequently, MoWR referred the Interim/Final Report of the MoEF Committee to Central Water Commission. The comments of CWC was received vide letter no. 7/6/2007/SSDC/188 dated 19th October, 2009, which are placed at **Annexure XLVII- 9**. Central Water Commission has reiterated that the study was done in CWC considering various parameters as deemed appropriate keeping the provisions of NWDT Award in view.

sent to  
the  
committee

#### **(C) FINAL REPORT OF THE MoEF COMMITTEE**

The final report of the MoEF Committee has not been received. However, Ministry of Environment & Forests has asked that all members of Expert Committee under Dr. D. Pandey's chairmanship should be invited to attend the 47<sup>th</sup> meeting of Environment Sub Group for giving a presentation on the report of the Committee.

Dr. D. Pandey, Chairman, MoEF Committee may like to present the report.

The Sub Group may like to deliberate and decide.

**Item No.XLVII-3(219): – REVIEW OF THE STATUS OF IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES FOR SARDAR SAROVAR AND INDIRA SAGAR PROJECTS**

**(A) SARDAR SAROVAR PROJECT**

On the basis of information received from the party States, the status of implementation of Environment Safeguard Measures and compliance to the conditions of environmental clearance are as under:

**(I) CATCHMENT AREA TREATMENT**

(Figure in Ha)

Sl. No.	Description	Madhya Pradesh	Gujarat	Maharashtra	Total
1	Catchment below ISP	2248600	30230	163611	2442441
2	Very High and High degraded area as identified by AISSLUI	433740	30230	100993	564963
3	Phase I area: Directly draining Very High and High degraded area	115622	29730	23425	168777
4	Phase I area: Target (after deducting untreatable area on account of being rocky/steep slope, etc.	110997	29157	23295	163449
5	Phase I area: Achievement	110997	29157	23295	163449
6	Phase I area: Achievement in %	100%	100%	100%	100%
7	Phase II area*: Freely draining Very High and High degraded area	318118	500	77568	396186
8	Phase II area*: Target (after deducting untreatable area on account of being rocky/steep slope, etc.)	318118	500	43125	361743
9	Phase II area*: Achievement	50308	500	21659	72467
10	Phase II area*: Achievement in %	15.8%	100%	50.2%	20.03%

Note: \* Phase II area is to be completed in 5 to 6 years' time as discussed during the meeting held on 09.07.2007 to discuss issue of sharing of costs of CAT works, under the chairpersonship of Secretary (E&F) & Chairperson, ESG.

**(II) COMPENSATORY PLANTATION:**

**a. In lieu of 13386 Ha forest area diverted for submergence**

Sl. No.	State		Target (Ha)	Achievement (Ha)	Achievement (%)
1	Gujarat	Degraded Forest Area	9300	9300	100%
		Non Forest Area	4650	4650	100%
		Total	13950	13950	100%
2	Madhya Pradesh	Degraded Forest Area	6538	6538	100%
		Non Forest Area	2199	2199	100%
		Total	8737	8737	100%

3	Maharashtra	Degraded Forest Area	12977	12977	100%
		Non Forest Area	6489	6402*	100%
		Total	19466	19379*	100%
GRAND TOTAL			42153	42066*	100%

\* - remaining area unfit for plantation

→ should have been replaced.

**b. In lieu of forest area diverted for rehabilitation in Maharashtra**

Target = 4200 Ha  
 Achievement = 4198 Ha (remaining area unfit for plantation)  
 Achievement (%) = 100%

**c. Progress in notification as forest area**

only 5.4 or approx 5.20?

States	Area to be declared (Ha)	Area declared (Ha)	% Achievement
1. Gujarat	4650	4650	100%
2. Maharashtra	10603.54	10582.69	99.8%
3. Madhya Pradesh	2199	1833	83.4%

**(III) COMMAND AREA DEVELOPMENT PLAN**

**Gujarat**

During the 44th meeting of the Environment Sub Group of the NCA held on 16th July, 2007, the Command Area Development Plan submitted by Govt of Gujarat was discussed and it was decided to form a Committee of Experts to review the plans for development of the Command Area. It was agreed that the Committee would review the plan presented by the State Government of Gujarat in view of the various conditions of the clearance given by the Ministry of Environment & Forests and the Planning Commission and adequacy of planning and mitigation measures for safeguarding the environment. Accordingly, a Committee of Experts under the Chairmanship of Executive Member, NCA comprising of representatives from Ministry of Environment & Forests, Ministry of Water Resources, Planning Commission, Central Arid Zone Research Institute, Indian Agricultural Research Institute, Centre for Management in Agriculture, IIM, Ahmedabad and NCA was constituted on 8th September, 2007. The Committee held its first meeting on 12th September, 2007 and carried out field visits and detailed discussions with Govt of Gujarat on 3rd & 4th October, 2007. Subsequently, a team of officers from Gujarat visited NCA, Indore, on 29th & 30th October, 2007 and finalized the outline of Command Area Development Plan. Subsequently, the Committee of Expert Group again held discussions on 12th February, 2008 and reviewed the progress made by the Govt. of Gujarat.



what happened?

The matter was again reviewed by the Secretary to Govt of India, Ministry of Environment & Forests in a review meeting held on 23rd April, 2008 wherein the representative of Govt of Gujarat stated that model micro plan for development of the Command Area was not available, and therefore, it could not be submitted earlier. He proposed to discuss the issue with NCA in detail to ascertain the needed formatting and assured submission of desired plan within a month's time for consideration of the Command Area Development Expert Group/Environment Sub Group/Ministry of Environment & Forests. In pursuance a meeting between Govt of Gujarat and NCA Officers were held on 5th & 6th May, 2008 at Indore, wherein detailed outline for preparation of Command Area Development Plan was finalized.

The Govt. of Gujarat has, accordingly, submitted modified report on Environment Safeguard Measures Plan for Command Area Phase-I in August, 2008, which was circulated among all members of the Committee of Experts on Command Area Development. The said CAD Plan was also discussed during the meeting held on 11<sup>th</sup> September, 2009, wherein it was decided that the CAD Plan would be forwarded to the Environment Sub Group along with the comments of the Members.

Only two comments were received in NCA Secretariat. The first comment was received from MoWR, which observed that the objectives of CADWM Programme have been considered in the modified Report and as such they have no comments to offer. The second comment was received from Dr. A.K. Bhattacharya during the meeting on 11<sup>th</sup> September, 2009, which was passed on to Govt of Gujarat to make available clarifications on his observations. Govt of Gujarat has submitted para-wise compliance/comments on the remarks offered by Shri A.K. Bhattacharya.

In pursuance of the decision taken in the meeting of Committee of Experts on CAD Plan held on 11<sup>th</sup> September, 2009, Govt. of Gujarat has circulated the CAD Plan submitted by Govt of Gujarat in August, 2008, along with comments of MoWR and Dr. A.K. Bhattacharya with para-wise compliance/ comments submitted by Govt of Gujarat amongst all Members of Environment Sub Group to facilitate finalization of the said CAD Plan by Environment Sub Group. L- *recd 6.12.10*

### Rajasthan

During the 45th Meeting of the Sub-Group, the representative of Government of Rajasthan (GoR) had informed that Wildlife Institute of India, ICMR, State Ground Water Board, WAPCOS, CAZRI, etc. are being involved in preparing the CAD Plan.

*Status?*

## (d) FLORA, FAUNA AND CARRYING CAPACITY

Terrestrial Environment :

Key Issues		Gujarat	Maharashtra	Madhya Pradesh
Flora-fauna and carrying capacity	Rehabilitation plan for the identified wildlife and plants impacted by submergence.	Schoolpaneshwar sanctuary has been extended from 102 sq.km. to 608 sq.km and developmental works are in advance stage. Biodiversity conservation plan in sanctuary areas is also in progress.	Buffer zone plantations to cover 2500 Ha to provide corridor for wildlife has been completed with 25,00,000 saplings of indigenous species to develop a live seed bank to promote and conserve local species from the area.	Draft EIA study report submitted by WII had recommended establishment of Kathiwada sanctuary at the cost of Rs. 13.97 crore at 2002 price level. NVDA had agreed to meet the said expenditure on notification of said sanctuary by Forest Deptt. <i>Status?</i>
Preparation and execution of plans as per recommendation of EIA Studies.	Execution of plan on recommendations of EIA studies, before submergence.	Multi-disciplinary Expert Group has been formed. 200 plants of <i>Butea monosperma</i> (yellow variant) have been planted. <i>Rudermachera xylocarpa</i> and other species are being preserved at MS University Botanical garden as well as covered under Biodiversity Conservation Plan.	EIA carried out by Deptt. of Environmental Sciences, University of Pune.	Social forestry plan had been taken up to enhance fuel and fodder availability. 60 Islands are proposed to be left undisturbed.

**Aquatic Environment :**

Key Issue		Gujarat	Maharashtra	Madhya Pradesh
Flora-fauna and carrying capacity (Fisheries/ water quality)	Upgradation of the plan considering guidelines circulated by the HLEG.	MoU signed with CICFRI, studies to commence.	Updation of plan for conservation of aquatic ecosystem is in advance stage.	Action Plan suggested by CICFRI (1994) to safeguard the aquatic Environment yet to be taken up for updating/ implementation.
	Stocking of the reservoir	488 lakh fingerlings stocked. Further stocking to continue.	13.50 lakh fingerlings stocked during 2005-06. Further stocking to continue.	Stocking started in 2007 and would be continued in this monsoon.
	Conservation measures implementation of the recommendations of CICFRI studies	Minimum flow downstream of SSP being maintained. Studies for water quality and morphological studies entrusted to CWPRS. 7 lakh grass carps released for control of suspended weed in the canal.	Agreed for tripartite agreement to ensure conservation of aquatic ecosystem, as recommended by HLEG.	The site for establishment of a Mahaseer Hatchery is under process. Director CIFA (ICAR) Bhubaneswar has been approached for technique to breed <u>Rita Pavimentata, etc.</u>  Fishery development activities to remain within the territorial jurisdiction of submergence of party States as per NWDT Award.

**Felling of trees before submergence :**

The status of felling of trees before submergence commensurate to height of the SS Dam to El. 121.92m is as under :

States	Progress	
	Target	Achievement
Gujarat	4522 ha.	100% completed. Coppice crops removal completed upto El. 121.92m.
Madhya Pradesh	71867 nos.	69287 nos. (96.4%)
Maharashtra*	1976 ha.	1949 ha. (98.6%)

\* Felling of trees is completed except for 27 Ha area due to agitation.

*different units.*

### (e) SEISMICITY AND RIM STABILITY

9 seismic monitoring stations along the periphery of the reservoir, 4 on either side and 1 at the downstream of Sardar Sarovar reservoir have been set up. Data from these monitoring stations are being regularly collected and put up before the Dam Safety Review Panel of Sardar Sarovar Project. ISR Gandhinagar has been entrusted the task of analysis of data from monitoring stations.

### (f) HEALTH ASPECTS

The Health issues primarily concerns (i) Disease surveillance, (ii) regular monitoring of incidences of water borne diseases and (iii) health delivery system in the project areas both on preventive and curative fronts. Surveillance of water borne diseases are normally being carried out under Integrated Disease Surveillance Project (IDSP) and National Rural Health Mission (NHRM) of Govt. of India.

The status of implementation of health safeguards for the Sardar Sarovar Project area is as under:-

Action	Gujarat	Maharashtra	Madhya Pradesh
Baseline Studies	Completed	Completed	Completed
Preparation of State Action Plan – Health Aspects	District wise Action Plans are prepared. These plans are being regularly updated by State Health Department every year looking to the susceptibility of the malaria and other water borne diseases.	Action Plan was submitted in 1987 and revised in 1991 & 1996. A draft health action plan 2007-08 was also submitted	Action Plan was submitted in 1996. The plan is further revised in August 2003.
Health Survey	Routine surveillance activities are carried out regularly under IDSP or NHRM of Govt. of India.	Routine surveillance activities are carried out regularly under IDSP or NHRM of Govt. of India.	Routine surveillance activities are carried out regularly under IDSP or NHRM of Govt. of India.
Establishment of health facilities at Dam site/ Peripheral villages.	50 bed hospital at Kevadia including a malaria unit. Medical laboratory and 20 mobile units 61 dispensaries	Rural Hospital – 4 Primary Health Centre – 26 Sub-Centers – 111 Floating dispensary – 2 Rescue Point - 25	1 Hospital, 1 mini PHC & 58 Dispensaries 30 bed hospital at Nisarpur completed and handed over to Health Department. Dharampuri Hospital being made functional. Provision of one Mobile Public Health laboratory has been made.

Vector control measures	Insecticidal spray Distribution of impregnated mosquito nets	Insecticidal spray Distribution of impregnated mosquito nets	Insecticidal spray Distribution of impregnated mosquito nets
Disease monitoring and responsibility	Entrusted to State Council of Health & Medical Services and EIA report has been submitted by SCHMS. Bi-weekly visits of 182 sites by 20 mobile units. Referral services by expert team consisting of three medical specialist	Entrusted to State Health Department Surveillance studies had commenced and survey report for Phase-I of the study has been submitted by Topiwala National Medical College, Mumbai. Phase-II of study is under implementation by Govt. College, Dhule.	Gandhi Medical College, Bhopal was entrusted with epidemiological surveillance studies. Entrusted to Evaluation Cell established by NVDA, under subject matter Specialist

#### (g) ARCHAEOLOGY AND ANTHROPOLOGY

The action plan included following issues on archeology and anthropology;

- (i) Cataloging of monuments and sites considered important from religious, historical and cultural angles
- (ii) Rehabilitation of monuments, wherever necessary

The current status of protection / relocation works is as under;

	Gujarat	Maharashtra	Madhya Pradesh
Monuments	2 (completed)	Nil	11 completed, 9 in progress.
Mounds	Nil	Nil	All 13 mounds at FRL completed
Museums/Parks	Nil	Nil	3 completed, 1 in progress

#### (B) INDIRA SAGAR PROJECT

The issue of monitoring of Indira Sagar Project was discussed in the 80<sup>th</sup> meeting of the Authority, wherein the GoMP reiterated that Indira Sagar Project cannot be monitored by Narmada Canal Authority and the Sub Group because it is not an inter-State Project and in view of the judgement of the Hon'ble High Court of Madhya Pradesh, Jabalpur in Writ Petition No. 3022 of 2005 Narmada Bachao Andolan Vs. Narmada Hydro-Electric Development Corporation And Ors. In the final order dated 8th September, 2009, the Hon'ble High Court of Madhya Pradesh, Jabalpur had inter-alia passed following orders with respect to NCA role in Indira Sagar Project;

*"110.(c) The award passed by the Narmada Water Disputes Tribunal is not applicable to the Indira Sagar Project except what has been stated therein and what has been clarified hereinbefore.*

*(d) The Narmada Control Authority has fundamentally no role vis-a-vis Indira Sagar Project. In any case the same has paled and melted into insignificance because of the interlocutory orders passed by this Court from time to time ascribing the role to the said authority and the Sub-Group of the same.*

*(o) The R&R group of Narmada Control Authority would do the field study and apprise the Grievance Redressal Authority with regard to the grievance of the affected persons."*

It was decided by the Authority in its 80<sup>th</sup> meeting that the issue will be decided by calling a separate meeting of the concerned. Till such time, the Environment Sub-group of NCA would continue to monitor the ISP.

During the 81<sup>st</sup> meeting of the Authority, it was informed that the Ministry of Environment & Forests (MoEF) vide O.M. No. 3-87/80-IA-I dated 09.07.2008 (modified vide OM dated 02.09.2008, copy enclosed as **Annexure XLVII- 3**) has constituted a Committee for assessment of Survey/Studies/Planning and implementation of the plans on Environment Safeguard Measures for Sardar Sarovar & Indira Sagar Projects.

During the 81<sup>st</sup> meeting of the Authority, MoEF vide its letter dated 05.03.2009 reiterated its view that the issue of monitoring of Indira Sagar Project by Environment Sub-group cannot be compromised and there was no such decision to discuss these issues in separate meeting. Any such discussions at this stage would infringe on the conditions of the clearance issued by the Central Govt. and violative of the relevant provisions. The Chairman, NCA had said that as no decision on the subject could be reached during the 80<sup>th</sup> meeting of NCA and since, the matter was concerning only one of the party States, it was decided to discuss the same in a separate meeting.

Subsequently, Hon'ble High Court of Madhya Pradesh, Jabalpur in its order dated 11.11.2009 in W.P. No.6056/2009 (PIL - Narmada Bachao Andolan V/s State of Madhya Pradesh & Others), has directed the Authority to ensure that the environmental safeguards and rehabilitation measures are planned and implemented pari-pasu with the works of the Indira Sagar and Omkareshwar Canal Projects. The subject matter is being brought out as a separate agenda.

The progress in implementation of Environment Safeguard Measures for Indira Sagar Project, as available in NCA Secretariat, is as under;

**(I) Catchment Area Treatment**

PHYSICAL TARGETS: FIGURES IN ha.				Assessment of adequacy
PHASE-I (61352)			Total	
Forest area	Targets	Achievement	60530* (100%)	Conservator of Forests (MP) survival percentage and average Crop height and Crop diameter for trees planted in forest areas.
	11515	10693		
Non Forest Area	49837	49837		Establishment of Silt monitoring station in sub watershed No Nk4n (high priority) under scrutiny of NVDA
PHASE-II (915150)				
Forest Area	Targets	Achievement	24317 (2.66%)**	Proposal is being worked out
	806720	9988		
Non Forest Area	108430	14329		Proposals are being worked out with AISLUS Nagpur and Dr. V.S.Katiyar Principal Scientist and Head, Central Soil and Water Conservation, Research and Training Institute, regional centre Distt Datia in MP

\* Balance area is unworkable due to rocky, precipitous slopes etc.

\*\*Progress is slow due to paucity of funds, as reported by GoMP.

**(II) COMPENSATORY AFFORESTATION**

As per MoEF clearance under Forest Conservation Act, for every hectare of forestland submerged or diverted for construction of the project, there should be compensatory afforestation on one hectare of non-forestland plus reforestation of two hectare of degraded forest. For the Indira Sagar Project, MoEF imposed a penalty of plantation on 150 ha over the clearance given in 1987. Beside this, plantations were also required over 308.47 ha of non forest land due to release of additional forest land after 1987.

Compensatory afforestation on 81436 Ha area has been completed against the target of 81445 Ha. Balance area is unworkable due to rocky, precipitous slopes etc. As per latest information available, all area has been notified under section 4.

**(III) COMMAND AREA DEVELOPMENT**

GoMP has appointed M/s MITCON Consultancy Services, Pune for preparation of CAD plan including EIA report and Environment Management plan for the command area of Indira Sagar Project by using a decision support system based GIS and the work is in progress.

Interim study report on impact of Agrochemical run off from fields on surface and ground quality in the command area has been received from J.N.K. University Jabalpur.

#### (IV) FLORA, FAUNA AND CARRYING CAPACITY

##### (a) Terrestrial Environment:

###### Felling of trees

	Targets (No. of trees)	Achievements (No. of trees)
Forest area : (29096.48 ha)	9533930	9532595
Other Govt. lands : (345.8 ha):	21563	21560
Revenue area: (6603.75 ha)	56939	56894
Private land (288 Khasra) :	40689	40689
Total : (36046 ha) :	9815481	9804356

###### Rehabilitation of Wildlife

Recommendations for creation of Sanctuaries / Parks by EIA Study Group included the areas.	Protected forest	Reserve Forest		Non Forest Area	Total
		Terrestrial	Aquatic		
Friends of Natures Society, Bhopal	49.19	692.99	133.40	18.19	893.77
Wildlife Institute of India, MoEF.	18.32	740.56	113.4	0	872.28
Madhya Pradesh	2.94	642.90	0	0	645.84

Wildlife Institute of India recommended creation of Narmada National Park, Omkareshwar Sanctuary & Suranmaya Sanctuary. Govt. of Madhya Pradesh, however, proposed Omkareshwar National Park, Singaji Sanctuary, Mandhata Sanctuary, Narmada Conservation Reserve Unit – 1, Narmada Conservation Reserve Unit – I, which covered the areas as per details above. The issue is under discussions in Environment Sub-Group of NCA / examination by the MoEF Committee.

An application in respect of Indira Sagar Project has been filed before the Central Empowered Committee constituted by Hon'ble Supreme Court of India in W.P. No. 202 of 1995 by Shri Dinesh Kothari, President, Society for Natural Education & Habitats for direct declaration of protected areas as per recommendation of Wildlife Institute of India, declaration of forest areas diversion vide letter dated 19.08.2004 as illegal, etc. During the course of hearing on 3rd December, 2007, the Central Empowered Committee suggested that the issue may be resolved within the frame work of NCA. Accordingly, a meeting under the chairmanship of Member (E&R), NCA was arranged wherein the issues were discussed with WII & MoEF Officers. *9. what happened*

##### (b) Aquatic Environment

EIA study groups recommended development of Water body for conservation purposes for rare endangered and threatened fauna. Accordingly, Fisheries Conservation and Development Plan of ISP was required to be prepared and implemented taking into consideration the concerns of the Environment Sub-Group in accordance with the recommendations of the CICFRI on conservation issues of Sardar Sarovar Project applicable to Indira Sagar Project as well.



Govt. of Madhya Pradesh sought guidance of the MoEF on developing fisheries in the Indira Sagar Reservoir area and a proposal was submitted by Govt. of Madhya Pradesh to the MoEF in this regard. The issue is under consideration of the Environment Sub-Group & MoEF. However, stocking of fingerling of Predominantly Katla, Rohu, and Mrigal have already been initiated by the M.P. Fisheries Federation for the last three years.

#### **(V) SEISMICITY & RIM STABILITY**

In order to study the seismic effects in the Indira Sagar Complex zone, a network of 10 seismological observatories with sophisticated instruments at following locations Narmada Nagar, Omkareshwar (Kothi), Maheshwar, Khandwa, Indore, Barwani, Bagli, Kannod, Hirapur, Channera and one additional at Pandhana. The seismic data is being recorded at 10 observatories. The pre and post impoundment data are collected and are analytically analysed.

The work of inferring long term trends by analyzing data acquired so far from 1995 to 2003 and 2003 onwards and also to provide training to project officers has been awarded to CWPRS, Pune for a sum of Rs.16, 82,740/- for a period from Jan.2007 to Dec.2009.

#### **(VI) HEALTH ASPECTS**

Surveys have been conducted in the Indira Sagar impact areas to investigate existing levels of health and to gather information on specific diseases. Three specific diseases namely malaria, schistosomiasis and filaria were studied. Other diseases investigated were leishmaniasis and scabies and other water borne diseases. Implementation of the action plan included water quality aspects.

1	Collection of baseline data.	Completed
2	Action Plan on health : Preventive measures proposed to control the incidence of water-borne / based / washed diseases. The large draw down strip, and the canals and drains, preventive measures were to be in place to keep the mosquitoes in check. Resistance of adult mosquitoes to commonly used biocides was noted and research to maintain effective biocides was to be continued on long term basis	The plan estimated to cost Rs.6.49 cores. Land leveling and land filling operations as well as appropriate vegetation clearing are being integrated. Control measures were to include larvae-eating fish in water bodies, mosquito-inhibiting plants, and clearing of vegetation and other actions to destroy breeding sites etc.

3	Reinforcement to the existing health delivery system.	
	At project site	A 20 bedded hospital has been constructed and made fully operational at Punasa. A 30 bedded hospital has been constructed and is being equipped at Chhanera. 8 ambulances/mobile vans have been provided to the Chief Medical and Health Officers of the concerned districts of the project area.
	On periphery of the reservoir	Existing SHCs in peripheral areas are being strengthened by providing them furniture, first aid boxes, emergency kits, stipend to health workers, surveillance workers and microscopes etc. The proposal for building "I" type Quarters for MPW female at the health centers is under process, so that these units will be more useful and functional, which, in turn, will reinforce the health delivery system.
	In the Command Area	J.L. Nehru University entrusted with studies on impacts of application of insecticides. Results of the studies would be incorporated for improving health in the command area plan under formulation,
	At R&R site : It is suggested that sanitary latrines be established at the R&R sites and Villagers may be educated to use these to keep the cases of Gastro diseases in check.	NVDA has built total 60 buildings at R/R sites and transferred 47 buildings out of them to the State Health Department to be made functional as Health Centers. Local societies at the R&R sites are being motivated to construct sanitary latrines. Sewerages system had been provided for urban R & R sites at Chanera (Harsud).
4	District health Authorities should be enlisted to monitor compliance with guidelines for malaria control and drinking water supply areas under the national directives.	NVDA has signed a MoU with the State Health Department to implement the Health Action Plan.
5	Gandhi Medical College, Bhopal completed, initial epidemiological studies and recommended : Surveillance of diseases on a long term basis and for improving the plan. Regular Entomological monitoring was also suggested for alterations in ecology of the area due to irrigation / impoundment.	Health monitoring cell was established in the NVDA for capture and analysis of the health related data under the control of health experts appointed by the NVDA. Geographic reconnaissance studies entrusted to ICMR.
6	Network of epidemiological surveillance studies as per national formats.	Monthly Statement showing Institutional Cases and Deaths due to Communicable Diseases were being compiled on monthly basis.

## (VII) ARCHAEOLOGY AND ANTHROPOLOGY

The State Department has submitted an Action Plan for relocation of monuments of archaeological significance earlier in 1993. According to this, the archaeological mound at village Khedinema was excavated. In revised action plan 2002, 8 monuments have been selected for relocation of which Shiv Mandir, (Dharikotla), Shiv Mandir (Harsud) & Chatri (Ghisor) have already been relocated. The current status of planned protection / relocation / excavation works is presented below:

	Monu-ments	mounds	Sculpt-ure	Cultural Center	Centrally protected Monument
Planned	8	5	188	A cultural Centre at Narmada Bhawan	North Bastion of Joga Fort at Hoshangabad
Progre-ssed	3	5	153		Protection of North Bastion
Balance	1	NIL	30		NIL

Further, in the 45<sup>th</sup> meeting of ESG held on 24.4.08, taking note of infringement of some of the conditions contained in the order of clearance, the Chairperson directed MoEF officials to take note for initiating suitable action in this regard. It was also decided that Forest Conservation Division of MoEF may be requested to expedite their decision on the request of GOMP to permit fishing in the part of ISP reservoir coming under reserve forest area. Progress in the matter may please be presented by the MoEF representative.

The Sub Group may like to review the status of implementation of Environment Safeguard Measures and compliance to the conditions of environmental clearance.

**Item No.XLVII-4(220): RAISING OF SARDAR SAROVAR DAM BEYOND EL. 121.92m**

The Govt. of Madhya Pradesh vide letter no. E&F/Tech./09/521 dated 08/04/09 has proposed two agenda items on raising of the height of Sardar Sarovar Dam, viz.,

- (a) **Raising of the height of Sardar Sarovar Dam beyond EL. 121.92m: Phase I construction of spillway piers to full height and bridge and installation of gates (to be kept in raised position)**

The agenda item submitted by GoMP along with the compliance report on gaps pointed out by ESG in 41<sup>st</sup> meeting is enclosed as **Annexure XLVII-10.** → *PSS*

- (b) **Raising of the height of Sardar Sarovar Dam beyond EL. 121.92m: Phase II Lowering down of gates and impounding water in the reservoir to Full Reservoir Level EL. 138.68m**

The agenda item submitted by GoMP along with the compliance status of fulfillment of FCA conditions and status of environmental safeguard measures are enclosed as **Annexure XLVII-11.**

In this connection, it is brought out that the Narmada Control Authority in its 76<sup>th</sup> (Emergency) meeting held on 8th March, 2006 permitted raising of the height from of the spillway of Sardar Sarovar Dam (SSD) EL 110.64m to EL 121.92m on the basis of the recommendations of the R&R Sub-group (63rd meeting held on 8.3.2006) and Environment Sub-group (41st meeting held on 6.1.2005) of NCA. In addition, the Authority directed the States to comply with the observations of R&R & Environment Sub Groups with regard to payment under Special Rehabilitation Package (SRP), implementation of Environment Safeguard measures and contingency plans to provide timely safeguards in case of any untoward incident and to ensure that there is no submergence before rehabilitation.

The proposals of Governments of Gujarat & Madhya Pradesh for further raising of Sardar Sarovar Dam beyond EL. 121.92m were discussed in the 80th meeting of NCA held on 12.08.08 and it was decided that *"further construction of Sardar Sarovar Project would be carried out in two phases -*

- (i) *Construction of spillway piers to its full height and bridge & Installation of gates (to be kept in raised position), and*
- (ii) *Lowering down of the gates and impounding water in the reservoir to Full Reservoir Level to EL 138.68 m.*

*The Authority decided that the issue of next stage of construction would first be considered in Environment Sub-group & R&R Sub-group including consultation with Grievances Redressal Authorities and thereafter the matter would be considered by the Narmada Control Authority."*

## (A) REVIEW OF BACKWATER / AFFLUX LEVELS

The Government of Madhya Pradesh had sought a clarification with regard to acquisition of buildings and appurtenant land up to final level of Sardar Sarovar Reservoir and consideration of tributaries in backwater computations.

As per Clause XI Sub-clause II (2) of the NWDT Award **“the backwater level at the highest flood level in Sardar Sarovar shall be worked out by the Central Water Commission in consultation with Madhya Pradesh and Gujarat.”**

Further as per Sub-clause VI, **“nothing contained in Clause XI shall prevent the alteration, amendment and modification of all or any of the foregoing Clauses by agreement between all the party States.”**

Accordingly, the matter was brought before the Authority in its 78<sup>th</sup> meeting held on 3rd May, 2007, where in it was decided that the review of back water levels be carried out by a technical committee comprising of representatives from CWC, NCA and party States. In pursuance of the said NCA decision, the Chairperson, NCA and Secretary to the Govt. of India, Ministry of Water Resources approved setting up of a Sub Committee under the Chairmanship of Chief Engineer, CWC. After necessary consultation with the party States through discussions in the Technical Committee, the Central Water Commission has worked out afflux / backwater level at highest flood level in Sardar Sarovar Project (SSP) by carrying out the hydrodynamic modelling and submitted the Final Report vide this office letter no. 7/6/2007/SSDC dated 12th June, 2008, which has been accepted by NCA in its 80<sup>th</sup> meeting held on 12th August, 2008. Also, as per revised backwater level studies, the new levels corresponding to afflux/submergence at dam site due to construction of piers, bridge has been computed as EL 134.15 m. against 134.32 m. considered while granting permission for raising the dam height to EL 121.92 m.

## (B) SUBSEQUENT DELIBERATIONS IN NCA

Subsequently, GoMP & GoG have brought out in the 81<sup>st</sup> meeting of NCA held on 16.03.09 that in view of there being no additional submergence due to raising of piers to full height and bridge as worked out by CWC, permission may be granted by the NCA itself without waiting for the reports of two Sub-groups. GoMP has also stated that on many occasion earlier, NCA has permitted construction of non-over flow portion of the dam, humps etc. directly without any reference to two Sub-groups as there was no additional submergence.

As there was no additional submergence due to phase-I construction and in view of deliberations in the 81st meeting of the Authority held on 16.03.09, “it was decided by the Authority to obtain legal opinion of the Attorney General for India on whether permission for construction can be given by NCA without following the procedure given in direction (2), (3) and (4) of Supreme Court Order dated 18/10/2000; for the following

—

*Even compliance levels required for earlier clearance for 121.92 in Jan 2005 have not been achieved.*

*"Construction of Spillway piers upto full height, overhead bridge and radial gates (to be kept in raised position) "*

The opinion of the Learned Attorney General for India was discussed in the 82nd meeting of the Authority held on 28.01.10. The Authority decided the issue of next stage of construction, i.e. Phase I should be considered in Environment Sub-group & R&R Sub-group (including consultation with Grievances Redressal Authorities) and thereafter the matter would be considered by the Narmada Control Authority. The Authority also noted that the issue of further raising of the Sardar Sarovar Dam is being discussed in the R&R Sub Group and it has been decided to proceed with consultation with the Grievance Redressal Authorities. The Authority asked the Secretary (Environment & Forests) to convene the next meeting of Environment Sub Group at an early date.

### **(C) DELIBERATIONS IN ENVIRONMENT SUB GROUP**

The matter of further raising of spillway piers and bridge was also discussed in the 45<sup>th</sup> meeting of Environment Sub-group held on 24.4.08 wherein it was recorded that:

*"During the deliberations that followed, the State Governments concerned promised to take necessary steps expeditiously to remedy the deficiencies in the implementation of the Environmental Safeguards, within the next two to three months.*

*It was decided that except for this there are no other major environmental issues in taking up further works on Sardar Sarovar Project without raising water levels, as far as Environment Sub-Group is concerned.*

*The Sub-group therefore recommended construction of piers and overhead bridge but no installation of gates until further review. Construction of piers and overhead bridge will cause additional/submergence of 1.62 m. Environmental Safeguard Measures commensurate with the additional submergence should be completed in time.*

*Status of compliance on implementation of the Environment Safeguard Measures would be reviewed during next meeting to be convened during June or July 2008".*

The Environment Sub-group in its 46<sup>th</sup> meeting held on 20<sup>th</sup> June 2008 had recorded:

*"Chairperson observed that there has been little progress in the implementation of Environmental Safeguard measures for Sardar Sarovar Project. She further observed that additional submergence of 1.62 meter due to construction of piers, is substantial and its impact needs to be looked into. The Managing Director, SSNNL explained that level of submergence has been studied by Central Water Commission. The construction would require a period of 30 months to complete. The Chairperson directed that construction of the piers/overhead bridge should be put on hold until the implementation of the requisite plans for addressing Environmental Safeguard Measures are assessed with reference to conditions contained in the order of clearance in the field and reviewed*

*by the Environment Sub-Group. She further directed to constitute a Committee by the Ministry of Environment and Forest (MoEF) for independent assessment which will assess the same and submit its report within three months for impacts of construction of piers and overhead bridge and with reference to permission for raising dam height upto FRL, the report could be submitted within 6 to 9 months time. The report, thereafter, would be reviewed by the Environment Sub Group before permitting any further construction."*

Accordingly, Ministry of Environment & Forests (MoEF) vide O.M. No. 3-87/80-IA-I dated 09.07.2008 (modified on 02.09.2008) has constituted a Committee for assessment of Survey/ Studies/Planning and implementation of the plans on Environment Safeguard Measures for Sardar Sarovar & Indira Sagar Projects.

The Committee was initially required to submit its report within 3 months' time, but has been granted time extension till 30th November, 2010. The final report of the MoEF Committee is still awaited.

The Committee has submitted an interim report on 13.2.09, which was forwarded by MoEF to the Chairman, NCA on 05.03.09. In this report (which was final report in respect of first part of the Terms of Reference on raising of piers and overhead bridge construction of Sardar Sarovar Project), the Committee has made certain observation on the backwater and afflux level studies. These have been brought out in the previous agenda item.

The Sub Group may like to deliberate and decide about further raising of the Sardar Sarovar Dam.

**Item No.XLVII-5(221): - IMPLEMENTATION OF ORDER OF HON'BLE HIGH COURT OF MADHYA PRADESH, JABALPUR IN W.P. NO.6056/2009**

Narmada Bachao Andolan had filed a W.P. No.6056/2009 (PIL) before the Hon'ble High Court of M.P., Jabalpur praying that no work on the canals be carried out without the execution of Resettlement and Rehabilitation Plans and without completion of Command Area Development Plans and without approval of these plans by the Union Ministry of Environment and Forests. The petitioners have also prayed that agricultural land in the Narmada region which is already irrigated be protected and displacement of persons be minimized by construction of the canal network. The petitioners have further prayed that the land acquisition process be quashed and no canal excavation work be carried out without prior consultation with the Gram Sabha in accordance with the provisions of the Panchayat (Extension to Schedule Areas) Act, 1996.

The State of Madhya Pradesh and Narmada Valley Development Authority have been listed as Respondent No.1 and 2 respectively. Ministry of Environment & Forest was listed as Respondent No. 3 and Narmada Control Authority as Respondent No.4.

Hon'ble High Court of Madhya Pradesh, Jabalpur in its order dated 11.11.2009 (**Annexure XLVII-12**) in W.P. No.6056/2009 (PIL – Narmada Bachao Andolan V/s State of Madhya Pradesh & Others), has directed as under :

- (i) no further acquisition of land, excavation or construction of the canal network for the Command Area of the Indira Sagar and Omkareshwar projects will be undertaken, until the Command Area Development Plans submitted to the Government of India, Ministry of Environment and Forests, are scrutinized by the Committee of Experts constituted for the Sardar Sarovar, Indira Sagar and Omkareshwar Projects by the Notifications dated 2.9.2008 and 17.9.2009 and until this Committee of Experts communicates its clearance in respect of the particular work to the respondents No.1 (State of Madhya Pradesh) and 2 (Narmada Valley Development Authority);
- (ii) the respondents No.1 and 2 will provide rehabilitation and re-settlement benefits of the Rehabilitation Policy of the Government of Madhya Pradesh for Narmada Valley Project to the displaced persons and displaced families of the Indira Sagar and Omkareshwar Canal Projects and will constitute a Grievance Redressal Authority which will decide the complaints of such displaced persons and displaced families regarding rehabilitation and resettlement;
- (iii) the respondent No.4 (Narmada Control Authority) will ensure that the two directions in (i) and (ii) above are implemented by the respondents No.1 and 2 and that the environmental safeguards and rehabilitations measures are planned and implemented pari-passu with the works of the Indira Sagar and Omkareshwar Canal Projects;



- (iv) the respondent No.4 will submit a report once every three months to this Court on whether the respondents No.1 and 2 are implementing the directions in this order."

Hence, the Hon'ble High Court of Madhya Pradesh, Jabalpur has charged the Authority with following two functions;

1. To ensure that the directions in (i) & (ii) above are implemented by Respondent No.1 (State of Madhya Pradesh) and 2 (Narmada Valley Development Authority) and that the Environment Safeguards and Rehabilitation Measures are planned and implemented pari-passu with the works of Indira Sagar Project & Omkareshwar Canal Projects.
2. To submit a report once every three months to the Court on whether the respondents No.1 and 2 are implementing the directions in this order.

The matter was discussed in the 82<sup>nd</sup> meeting of NCA held on 28.01.10, wherein the Authority directed Government of Madhya Pradesh to furnish the information to the agencies of NCA, viz., Environment Sub Group & R&R Sub Group in accordance with the direction (i) & (ii). These agencies would monitor the progress and the report would be filed after receipt of the information from the concerned. An affidavit seeking four month's time to submit first report has been filed before the Hon'ble High Court of Jabalpur.

The Sub Group may like to deliberate and decide further course of action.

## Item No.XLVII-6(222): COST SHARING OF ESTABLISHMENT OF KATHIWADA WILD LIFE SANCTUARY

The Govt. of Madhya Pradesh vide letter no. E&F/Tech./09/521 dated 08/04/09 (**Annexure XLVII-13**) has proposed an agenda item on cost sharing of establishment of Kathiwada Wild Life Sanctuary. GoMP has brought out that Govt of India while according clearance for diversion of forest land for SSP had stipulated following condition vide letter No.8-372/83-FC dated 6<sup>th</sup> January, 1989 (Annexure-I).

“(xii) For conservation and management of wildlife, a Committee will be constituted by the State Govt. by 31<sup>st</sup> January, 1989 which will include a representative from Government of India. The Committee will suggest the necessary steps to be taken and draw up a plan which will be implemented at the cost of the project.”

In compliance to above condition, Govt of M.P. had constituted Wild Life Committee vide order no.F-5/59/83/10/3 dated 29.05.90 (Annexure II). Wild Life Committee had proposed establishment of two sanctuaries i.e. Mathwad & Kathiwada and recommended expenditure of Rs.21.76 crores & 13.97 crores respectively (Annexure III). Subsequently Wild Life Institute of India, Dehradun (WII) had been entrusted to carry out EIA study in the area. WII had submitted its report in February 2008 and recommended establishment of Kathiwada Wild Life Sanctuary in Jhabua District. Executive summary of the report of WII is annexed as Annexure IV. Report of WII had been accepted by GoMP in principle and GoMP is in the process of declaring Kathiwada sanctuary and examining the proposal from various angles. In the meantime NVDA had approved expenditure of Rs.13.94 crores at 2002 price level on 17.06.08 (Annexure V).

M.P. Forest department while examining the report of WII had found that establishment of Kathiwada Sanctuary will require relocation of 6 villages and will involve expenditure of Rs.50.7 crores (Annexure VI). Thus establishment of Kathiwada Sanctuary will involve total expenditure of Rs.64.67 crores.

The establishment of sanctuary is a condition imposed by Gol, MoEF, for diversion of forest land required for Sardar Sarovar Project and the Sardar Sarovar Project include three units as follows:

Unit I	Dam
Unit II	Canals
Unit III	Power House

Thus, GoMP has proposed that cost to be incurred on establishment of Kathiwada had to be loaded on all three units of Sardar Sarovar Project and is to be shared between all four States, viz., Madhya Pradesh: Gujarat: Rajasthan: Maharashtra in proportion 14:77:3:6.

In this connection, it is brought out that there is no stipulation regarding cost sharing on environmental issues in the NWDT Award as it didn't consider the environmental issues. However, NWDT Award has dealt with acquisition of land and rehabilitation of oustees and clause XI – V(12) of NWDT Award provides for charging of these costs to Unit I: Dam and Appurtenant Works. The establishment of Kathiwada Sanctuary is due to acquisition of forest land with intention to rehabilitate Wild Lives, the expenditure on establishment of Kathiwada Sanctuary may be charged to Unit I of Sardar Sarovar Project. Similar decision was taken while deciding the issue of sharing of costs on Catchment Area Treatment by ESG.

The Sub Group may like to deliberate and decide.

*Not a part of the ESG mandate .*

**Item No.XLVII-7(223): STRENGTHENING OF ENVIRONMENT WING IN NCA**

Ministry of Environment & Forests granted environmental clearance to Narmada Sagar Project, Madhya Pradesh and Sardar Sarovar Project, Gujarat on the following conditions;

- (i) The Narmada Control Authority (NCA) will ensure the environmental safeguard measures are planned and implemented pari passu with progress of work on projects.*
- (ii) The detailed survey/studies assured will be carried out as per the schedule proposed and details made available to the Department for assessment.*
- (iii) The Catchment Area Treatment Programme and the Rehabilitation Plans be so drawn as to be completed ahead of reservoir filling.*
- (iv) The Department should be kept informed of progress on various works periodically.*

Accordingly, the Narmada Control Authority constituted two Sub Groups, namely, Environment Sub Group under the chairmanship of Secretary (Environment & Forests) and Resettlement & Rehabilitation Sub Group under the chairmanship of Secretary (Social Justice & Empowerment). In addition, the posts of Member (Environment & Rehabilitation), Director (Impact Assessment & Rehabilitation) and Director (Environment) along with associated staff were created to provide secretariat assistance to these two Sub Groups.

In the meanwhile, Ministry of Environment & Forests (MoEF) vide O.M. No. 3-87/80-IA-I dated 09.07.2008 (modified on 02.09.2008, copy enclosed as **Annexure XLVII- 3**) has constituted a Committee for assessment of Survey/ Studies/Planning and implementation of the plans on Environment Safeguard Measures for Sardar Sarovar & Indira Sagar Projects. Dr. Devender Pandey, then Director General, Forest Survey of India, Dehradun has been made the Chairman of the said Committee with the Chief Conservator of Forests, Regional Office, MoEF, Bhopal as the Member Secretary. The Terms of Reference were;

- (i) The committee would examine adequacy of the survey/studies/ planning/implementation and monitoring of the required plans in the light of the relevant provisions contained in the NWDT Award from environmental angle and/or conditions contained in the order of clearance issued to the SSP and ISP by the MoEF and clarifications/ assurances given by the project authorities while seeking clearances. The Committee would also focus on the issues brought out by the members of the Environment Sub-Group from time to time and would make appropriate recommendations on the assessment of compliances.*

- (ii) The committee shall meet as often as necessary and shall also undertake field visit to the areas, during reviews of the plan/implementation. The committee will interact with officers/experts of SSNNL/NVDA/Concerned organizations of Rajasthan and Maharashtra for appraisal/assessment. The committee would also consider constraints and compulsions of the executing agencies, views of the inhabitants of the impacted areas.
- (iii) Initially the committee is expected to undertake assessment work relating to mitigation of impacts generated by raising of the piers and overhead bridge of Sardar Sarovar Project within 3 months time. After assessing the report, tenure of the committee would be renewed if considered necessary.
- (iv) The committee could use the modern technologies and data bank in their work and would also review/develop indicators and mechanism for long term monitoring of implementation of the plans on parameters like command area/downstream and conservation of aquatic system, within the ambit of the order of clearance/responsibilities entrusted to the Environment Sub Group.

The above MoEF Committee's Term has been extended at present upto 30<sup>th</sup> November, 2010 and is likely to continue further as its scope has been extended to cover Indira Sagar and Omkareshwar Projects also.

It can be seen that the Terms of Reference of the above mentioned Committee are similar to the functions assigned to Environment Committee and Environment Directorate of Narmada Control Authority, making the Environment Directorate of NCA defunct. Keeping this in background and taking note that most of the studies related to Environment Safeguard Measures and preparation of Command Area Development Plan have been completed, the NCA Secretariat Organisational Review Committee set up by the Authority, has recommended abolition of the post of Director (Environment). The residual works relating to Environment Impact Assessment can be taken care of by Impact Assessment Rehabilitation Directorate and those of field monitoring by Regional Offices.

The Sub Group may like to deliberate and decide about strengthening of the Environment Wing in NCA.

Item No.XLVII-8(224): ANY OTHER ITEM

DATE AND TIME OF THE NEXT MEETING

# ***ANNEXURES***

Annexure - XLVII - 1

## नर्मदा घाटी विकास प्राधिकरण

नर्मदा भवन, 59 अरेरा हिल्स, भोपाल

कमांक/पर्या. एवं वन/तक./09/605

भोपाल, दिनांक 29/4/09

प्रति,

कार्यकारी सदस्य

नर्मदा नियंत्रण प्राधिकरण

नर्मदा सदन, स्कीम न. 74 सी

विजय नगर इन्दौर- 452010

**Subject - Preparation of Agenda note for the proposed 47th meeting of Environment Sub-group of NCA.**

**Reference - Your Letter No. Env.3 (47)/2009/404 dated 26 March 2009.**

विषयांतर्गत संदर्भित पत्र द्वारा नर्मदा नियंत्रण प्राधिकरण की 46 वीं बैठक के कार्यवृत्त पर आयटम कमांक XLVI-3(115) के पृष्ठ क-6 के अंतिम पैरा के अंत में निम्नानुसार अंश जोड़े जाने, का प्रस्ताव प्रस्तुत है।

" Vice Chairman, NDVA said that in the 45<sup>th</sup> meeting of ESG dated 24.04.08, it was unanimously decided to recommend construction of piers and overhead bridge, but no installation of crest gates until further review. It will be seen that this decision was taken after noting that additional submergence due to the piers and the bridge would be 1.62 meters. Further the decision in the 45<sup>th</sup> meeting was taken unanimously by the Sub-group while decision that construction of the piers/overhead bridge should be put on hold is not unanimous and participatory States do not agree to this. Thus the decision taken in the 45<sup>th</sup> meeting of ESG cannot be unilaterally changed in the 46<sup>th</sup> meeting by one of the members (or Chairman) of ESG.

It was also pointed out that NCA had been monitoring the progress of environmental safeguards measures of Sardar Sarovar Project by its Subcommittee, therefore, there is no need for ESG to take a decision to constitute a committee by MOEF on the issue."

कृपया उपरोक्त प्रस्ताव को कार्यवृत्त में सम्मिलित करने का कष्ट करें। यहाँ पर उल्लेखनीय है कि इस कार्यालय द्वारा पूर्व में भी अर्द्धशासकीय पत्र कं 1363, दिनांक 08.07.2008 एवं अर्द्धशासकीय पत्र कं 12, दिनांक 18.07.2008 द्वारा श्री बी.के. ज्योति कार्यकारी सदस्य, नर्मदा नियंत्रण प्राधिकरण, विजय नगर, इन्दौर को लेख किया गया है। तदोपरान्त अर्द्धशासकीय पत्र कं/174/PS/VC/NDVA, दिनांक 21.10.2008 द्वारा सचिव जलससाधन मंत्रालय, भारत सरकार, नई दिल्ली को लेख करते हुए सभी संबंधित राज्यों के मुख्य सचिवों एवं कार्यकारी सदस्य, नर्मदा नियंत्रण प्राधिकरण, इन्दौर उक्त पत्र की प्रतिलिपि पृष्ठांकित की गई है। इन पत्रों की प्रतिलिपियाँ अवलोकन हेतु संलग्न की जा रही है। अतः संशोधन प्रस्ताव अग्रिम कार्यवाही हेतु प्रेषित है।

संलग्न- उपरोक्तानुसार

उपाध्यक्ष 29/4/08  
नर्मदा घाटी विकास  
प्राधिकरण, भोपाल



नर्मदा घाटी विकास प्राधिकरण  
NARMADA VALLEY DEVELOPMENT AUTHORITY  
मध्यप्रदेश शासन  
GOVT. OF MADHYA PRADESH

Pradip Bhargava  
Additional Chief Secretary NVDD  
and Vice Chairman NVDA

D.O. No. 1363 dt 8/7/08

Dear Shri V.K. Jyothi,

Kindly recall discussion in the 46<sup>th</sup> meeting of Environment Sub-group (ESG) held on 20.6.08.

The Narmada Water Scheme, framed by GOI by Notification dated 10.9.1980 (amended from time to time), provides that, "the Authority may constitute one or more sub-committees and assign to them such of its functions and delegate such of its powers as it thinks fit". The ESG was constituted by NCA in its 27<sup>th</sup> meeting held on 8.1.1988 by setting out the functions to be performed by the sub-group on behalf of NCA. As ESG is assigned the functions to be performed on behalf of NCA the rules for conduct of business framed by NCA will be applicable to ESG. NCA has framed the rules for conduct of its business in 1990. However, it was categorically stated in the 46<sup>th</sup> meeting of ESG that there were no business rules for ESG which was non-factual.

In the 45<sup>th</sup> meeting of ESG dated 24.4.08 it was decided to recommend construction of piers and over head bridge, but no installation of crest gates until further review. Extract from the minutes of the 45<sup>th</sup> meeting of ESG is reproduced below:-

"Any other item (page 27).

The sub-group therefore recommended construction of piers and over head bridge but no installation of gates until further review. Construction of piers and over head bridge will cause additional submergence of 1.62 metres. Environmental safeguard measures commensurate with this additional submergence should be completed in time".

VC-5.7.08-b

It will be seen that the above decision of ESG in the 45<sup>th</sup> meeting was taken after noting that additional submergence due to the piers and the bridge would be 1.62 metres. It cannot, therefore be said that additional submergence was not taken into account in the 45<sup>th</sup> meeting. Further the decision in the 45<sup>th</sup> meeting was taken by the Sub-group and it cannot be changed in the 46<sup>th</sup> meeting by one of the Members (or Chairman) of ESG as all Members have equal powers. In para 5 of the rules for conduct of business of NCA, 1990, it is provided that every question "shall be decided (by NCA) by majority of Members present" and that, "in the case of equality of votes the Chairman shall have a second or casting vote; save as aforesaid, the members shall have equal powers".

It is requested that the above position may be brought to the notice of the Chairman ESG for appropriate action.

Yours sincerely

(Pradip Bhargava)

To,

Shri V.K. Jyothi,  
Executive Member,  
Narmada Control Authority,  
Narmada Sadan, Sector-B,  
Scheme No. 74, Vijay Nagar,  
Indore 452010 (M.P.)

Pradip Bhargava  
Additional Chief Secretary NVDD  
and Vice Chairman NVDA

D.O. No. 12  
Dated 18.07.08

Dear Shri V.K. Jyothi,

In my D.O. letter No. 1363 dated 8.7.08 (copy enclosed) I had pointed out that according to the rules of business there were equal powers to the Members of NCA or its Sub-groups and that alteration cannot be made in the decision taken by all the members of the Sub-group, at the instance of one of the Members (or the Chairman) in a subsequent meeting.

From the minutes of the 46<sup>th</sup> meeting of ESG held on 20.6.2008 it is seen that inspite of the opposition of other Members the Chairman of ESG reversed the decision taken by the Sub-group in the 45<sup>th</sup> meeting held on 24.4.2008 for recommending the construction of piers and bridge at SSP. The relevant decisions in the said two meetings are extracted below:-

Extract from the minutes of the 45 <sup>th</sup> meeting of ESG dated 24.4.08	Extract from the minutes of the 46 <sup>th</sup> meeting of ESG held on 20.6.08
"The Sub-group therefore recommended construction of piers and over head bridge but no installation of gates until further review. Construction of piers and over head bridge will cause additional submergence of 1.62 metres. Environmental safeguard measures commensurate with this additional submergence should be completed in time".	"The Chairperson directed that construction of the piers/overhead bridge should be put on hold until the implementation of requisite plans for addressing Environmental Safeguard Measures are assessed w.r.t. conditions contained in the order of clearance in the field and reviewed by the environment Sub-group".

It is requested that the matter may be placed in the next meeting of NCA to issue appropriate directions regarding the conduct of business in the Sub-groups of NCA and to uphold the unanimous decision taken in the 45<sup>th</sup> meeting of ESG reproduced above.

Yours sincerely

(Pradip Bhargava)

To,

Shri V.K. Jyothi,  
Executive Member,  
Narmada Control Authority,  
Narmada Sadan, Sector-B,  
Scheme No. 74, Vijay Nagar,  
Indore 452010 (M.P.)

(57)

Copy for Environment wing

PRADIP BHARGAVA  
Vice Chairman &  
ACS, NVDD

NARMADA VALLEY DEVELOPMENT AUTHORITY

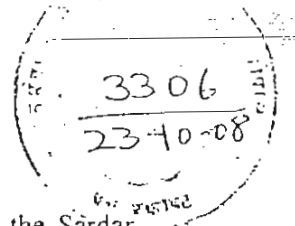
नर्मदा घाटी विकास प्राधिकरण

GOVT. OF MADHYA PRADESH

मध्यप्रदेश शासन

D No. 174/PS/VC/NVDA  
Bhopal, Dated, 21.10.2008

Dear Shri Panjiyar,



We have been trying to achieve further progress on the raising of the Sardar Sarovar dam. It is in the interest of all the participating States that SSP is completed as early as possible so that they enjoy the full benefits of the Project.

2. I had requested the Union Secretary MOWR vide my letters in this regard as under:-

- (i) Endorsement No. 334/SI-III/SSP/186 dated 5.5.2008 for considering by NCA the alternative of construction of piers and over head bridge at SSP.
- (ii) Endorsement No. PA/VC/NVDA/08/95/1341 dated 5.7.2008 for considering that there would no additional submergence due to construction of piers and over head bridge at SSP.
- (iii) Endorsement No. VC/NVDA/Adv./112 dated 28.7.08 for considering installation of gates also along with the piers but kept in open position as there would be no additional submergence over and above that already considered while giving permission to raise the Sardar Sarovar dam upto crest level EL. 121.92 m in the 76<sup>th</sup> meeting of NCA held on 8.3.2006.

3. On behalf of GOG also a proposal was submitted to NCA for considering construction of piers and over head bridge at SSP vide SSNNL letter No. SSNNL/NMD/2008/5/D&PH dated 2.8.2008.

36

4. The proposal of raising the Sardar Sarovar dam beyond 121.92 m was considered in the 80<sup>th</sup> meeting of NCA held on 12.8.2008. It was decided that further construction of Sardar Sarovar dam would be carried out in two phases as under:-

- (b) Construction of spill way piers to its full height and bridge and installation of gates (to be kept in raised position) and
- (c) Lowering down of the gates and impounding water in the reservoir to FRL 138.68 m.

On behalf of GOMP and other party States it was submitted that no additional submergence is involved in the proposal of construction of piers and the bridge and installation of gates (kept in raised position) and hence permission for this first phase construction could be granted by NCA.

It was however decided, in the said meeting of NCA that the next stage of construction, as above, would first be considered by the Environment Sub-group and the R&R Sub-group including consultation with the Grievance Redressal Authorities (GRAs) and then the matter would be considered by NCA.

5. Due to raising of the Sardar Sarovar dam above the crest level of 121.92 m the additional submergence will be mostly in Madhya Pradesh. GOMP has already submitted the Action Taken Report (ATR) about completion of R&R upto FRL 138.68 m in March 2008 but even though verification by the office of the NCA is completed, consultations with the GRA has not yet been started inspite of many reminders to the Executive Member NCA in this regard. GOMP also submitted the formal ATR for construction of piers and the bridge (with installation of gates in open position) vide letter dated 5.5.2008 to the Executive Member, NCA.

6. The R&R Sub-group has not yet fixed the date for its meeting to consider the proposal of constructing piers, over head bridge and gates in open or raised position. On behalf of GOMP the Executive Member, NCA, has been already requested to include the first phase of the proposal of raising the Sardar Sarovar dam (i.e. piers, bridge and open gates) in the agenda of the next meeting of R&R Sub-group.

The conditions which were mentioned by the R&R sub-group while recommending raising of the Sardar Sarovar dam upto the crest level EL 121.92 m are under compliance with right earnest.

7. The Environment sub-group had recommended construction of piers and overhead bridge at SSP in its 45<sup>th</sup> meeting held on 24.4.08 but the Chairman of the Environment Sub-group in the next meeting i.e. 46<sup>th</sup> meeting held on 20.6.08, changed the decision and directed that construction of piers and overhead bridge should be put on hold until implementation of the requisite plans for addressing environmental safeguard measures are assessed with reference to conditions contained in the order of clearance in the field and reviewed by the Environment Sub-group (ESG). The Chairperson of the Environment Sub-group had no authority to unilaterally change the decision taken in the 45<sup>th</sup> meeting of ESG. This was pointed out by us vide D.O. letter No. 1363 dated 8.7.2008 to the Executive Member of NCA. The MOEF has now set up a Committee vide office Memorandum No. 3-87/80-IA-1 dated 9.7.2008—mainly to examine the adequacy of implementation of safeguard measures from environmental angle. It appears the ESG will wait for the report of the said committee on the ATR for raising the height of Sardar Sarovar dam even for the first phase (piers, bridge and gates open) and then only give its recommendations. At the time of recommending raising of the Sardar Sarovar dam up to crest level EL 121.92 m. the ESG had mentioned certain gaps pertaining to i) CAT, (ii) CA, (iii) Flora, Fauna and carrying capacity, (iv) felling of trees, (v) social forestry plan, (vi) Fishery conservation, (vii) Health aspects and (viii) Archaeology. These have mostly been complied with.

8. From the above narration it is clear that both the sub-groups are not interested in considering even the first phase of raising the Sardar Sarovar dam and give recommendation in this respect.

9. It may be mentioned that permission to raise the dam from EL 110.64 m to the crest level EL 121.92 m was accorded by NCA in the 76<sup>th</sup> meeting held on 8.3.2006. At that time the afflux was considered at El 134.32 without taking into account the moderation of flood at Indirasagar. Now a Technical Committee has examined the issue of magnitude of flood to be adopted for the final stage of SSP and CWC have confirmed the afflux in the first stage (with piers, bridge and gates open) at 133.65 m. considering flood moderation at ISP dam which is now completed. Thus there would be no additional submergence due to the 1<sup>st</sup> phase of construction and permission could be straight way accorded by NCA without any report from the two sub-groups. A period of about 1 ½ years will be required in completing the first stage construction. The fair weather season is already commenced and any delay in taking a decision in this regard will result in loss of one more year before the full benefits of the project could be available to the States and the people at large.

(40)

10. It is, therefore, my <sup>current</sup> request that a special meeting of NCA may be convened very early to discuss the matter and taken a decision in the interest of early completion of the project as directed by the Hon'ble Supreme Court in the Decision dated 18.10.2000.

With regards,

Yours Sincerely

*[Signature]* 21.10.08  
O/c (Pradip Bhargava)

To,

Shri Umesh Narayan Panjiar,  
Secretary  
Government of India,  
Ministry of Water Resources,  
Shram Shakti Bhawan, Rafi Marg,  
New Delhi. 110001.

Endt.No. 175/PS/VC/NVDA

Bhopal, dated 21.10.08

Copy forwarded for information to

1. The Chief Secretary, Government of Maharashtra, Mantralaya, Mumbai, Maharashtra.
2. The Chief Secretary, Government of Gujarat, New Sachivalaya, Gandhinagar, Gujarat.
3. The Chief Secretary, Government of Rajasthan, Sachivalaya, Jaipur, Rajasthan.
4. The Executive Member, NCA, Narmada Sadan, Section B, Scheme No. 74, Vijaynagar, Indore 452010 (MP).

39

*[Signature]*  
O/c (Pradip Bhargava)



Annexure - XLVII-2

# dar Sarovar Narmada Nigam Ltd.

" A Wholly owned Govt. of Gujarat undertaking "

12, 1st Floor,  
Shivalaya Complex,  
Gandhinagar - 382 010. Gujarat.  
3223530-37

Fax : 079 - 23223056

No.SSNL/ENV/ESG/47/ <sup>460</sup> /2009

April 9, 2009.

To,

The Executive Member  
Narmada Control Authority,  
Narmada Sadan, Scheme No.74-C,  
Vijaynagar, Indore:452010.

RECEIVED  
7/29  
13/4/09

Sub.: Preparation of Agenda Note for the proposed 47<sup>th</sup> meeting of the  
Environment Sub-Group of NCA.

Ref.: Your letter No.Env.3(47)/2009/404 dt.26.3.2009

Sir,

Enclosed, please find herewith the latest status of compliance of  
implementation of Environmental safeguard measures for SSP (Annexure-I).

Also, included is, the comments on the minutes of the 46<sup>th</sup> meeting of ESG of  
NCA, as sought for in the letter under reference (Annexure-II).

With regards,

Yours sincerely,

Encl: As above

(S.D.Vora)

Chief Conservator of Forest  
for SSNNL, Gandhinagar.

Comments on Item No. 46<sup>th</sup> meeting of Environmental Sub-Group.

Agenda Item.XLVI-3 (115)- SARDAR SAROVAR PROJECT ; REVIEW OF STATUS OF IMPLEMENTATION OF ENVIROMET SAFEGUARD MEASURES WITH RESPECT TO FULL RESERVOIR LEVEL.

In the last few paragraphs, the omission remind in the minutes are brought to the notice for your kind consideration :

1. The party states did not agree with the formation of the Committee.
2. Govt.of Gujarat requested to provide information with regards to the calculation of 1.62 mt additional submergence.
3. The discussion to form a Committee was with respect to 1.62 mt. additional submergence only, and not with respect to FRL.
4. The time framed considered in the meeting for the committee was for the period of three months only and not 6-9 months as minutised.
5. Letter written in this regard by M.D., SSNNL on 28<sup>th</sup> July, 2008 (Copy enclosed) may also be taken into consideration.

*R. K. Tripathy, IAS,  
I/c Managing Director*

No:SSNNL/MD/ESG/NCA/ 404/08  
Date: 24<sup>th</sup> July 2008

To,  
The Chairperson  
Environment Subgroup &  
The Secretary  
Ministry of Environment & Forest  
Government of India  
Paryavaran Bhavan,  
CGO Complex, Lodhi Road,  
New Delhi -110 003

Sub: Constitution of a committee for assessment of survey/studies/planning and implementation, of the plans on environmental safeguard measures for Sardar Sarovar & Indira Sagar Project.

Ref: OM No.3-87/80/IA-I of GOI, MOE&F dated 9/7/2008.

Sir,

The Environment Sub-Group at its 45<sup>th</sup> Meeting recommended construction of Piers and Overhead Bridge over Sardar Sarovar Dam. Subsequently, in the 46<sup>th</sup> Meeting held on 20<sup>th</sup> June 2008, it was decided to form an independent Committee of Experts to undertake assessment work relating to mitigation of impacts generated by raising of Piers and Overhead bridges over the Dam. As mentioned in the office memorandum referred in above itself, the Committee is constituted on the premise of additional submergence of 1.62 mt. calculated by Narmada Control Authority.

Surprisingly, the aforesaid office memorandum also includes the assessment/evaluation of the surveys/studies, an implementation of the required plans and their monitoring in compliance with conditions of the Environmental Clearance granted to the project by Central Government. In this connection, your kind attention is drawn to the fact that it was neither discussed nor decided during the 46<sup>th</sup> meeting that the committee will also assess and evaluate the surveys & studies and implementation with respect to Full Reservoir Level of 138.68 mt. It is pertinent to

state here that the decision to form a committee was in line with the decision taken earlier, i.e. 45<sup>th</sup> meeting of Environment Sub-Group, to allow construction of Piers and Overhead Bridge which in turn, if at all, will cause additional submergence of 1.62 mt. and not in regard to the FRL of reservoir.

2. Your kind attention is also drawn towards Managing Director, SSNNL's letter No.SSNNL/MD/NCA/15/2008 dt.26/6/2008 citing the subject "45<sup>th</sup> Meeting of Environment Sub-Group held on 24<sup>th</sup> April, 2008" in the subject matter. Reiterating the stand as submitted in the letter, the constitution of the Committee, is feared, will hardly serve the very purpose. In context of this, it is requested to provide us the details of the calculation based on which additional submergence of 1.62 mt is calculated by Environment Sub-Group of Narmada Control Authority.

3. Further, it would be worth mentioning here that the Sub-Group decided that the committee shall submit its report within three months time of constitution. However, the minutes of the 46<sup>th</sup> meeting of Environment Sub-Group issued by Narmada Control Authority has extended the submission period of the report up to 6 to 9 months. This is against the spirit of the discussion took place in the meeting.

4. Clause- iv of the Office Memorandum suggest use of modern technologies, and data bank in their work and thereby, develop indicators and mechanism for long term monitoring. The project authorities although welcome this move, the implication on the works completed at this juncture, may lead to enormous delay in the compliance and thereby jeopardize the early benefit from the project. This concern of the project authorities may kindly be brought to the knowledge of the esteemed Committee.

The above views and objections be appropriately considered.

With regards,

Yours sincerely,

( R. K. Tripathy )

Copy to:- Shri V.K Jyothi,  
Executive Member,  
Narmada Control Authority,  
Narmada Sadan, Sector-B,  
Scheme No.74, Vijay Nagar,  
Indore-452 010

Amexime-XLVII-3

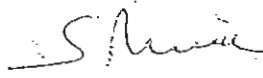
No. 3-87/80-IA-I  
Government of India  
Ministry of Environment & Forests

Paryavaran Bhawan  
C G O Complex,  
Lodi Road,  
New Delhi-110003

Dated: 2.09.2008

**Sub: Constitution of a committee for assessment of survey/ studies/planning and implementation, of the plans on environmental safe guard measures for Sardar Sarovar & Indira Sagar Project.**

As Narmada Control Authority did not agree to bear the expenditure towards TA/DA, sitting fee etc. of non-official members, the Ministry has decided to bear the same. Hence a revised O.M. has been issued (enclosed). The meeting of the committee now may please be held expeditiously.

  
(Dr. S Bhowmik)  
Additional Director

To

Dr Devendra Pandey, Chairman  
Director General  
Forest Survey of India  
Kaulagarh Road, P.O.- IPE  
Dehradun-248195

Copy to:

All the Members (as per list)

No. 3-87/80-IA-I  
Government of India  
Ministry of Environment & Forests

Paryavaran Bhawan  
C G O Complex,  
Lodi Road,  
New Delhi-110003  
Dated: 2.09.2008

OFFICE MEMORANDUM

**Sub: Constitution of a committee for assessment of survey/ studies/planning and implementation, of the plans on environmental safe guard measures for Sardar Sarovar & Indira Sagar Project.**

1. In supersession to this Ministry's earlier O.M. of even number dated 09.7.2008, it has been decided/ mentioned that the Environmental Sub Group at its 45<sup>th</sup> meeting held on 24<sup>th</sup> April 2008 recommended construction of pier and overhead bridge for Sardar Sarovar Project (SSP). It was not known at that time that this will cause additional submergence of 1.62 mt. Therefore during the 46<sup>th</sup> meeting of the Environment Sub Group of Narmada Control Authority, It was decided to form an independent Committee of Experts to undertake assessment work relating to mitigation of impacts generated by raising of the piers and overhead bridge of Sardar Sarovar Project. In addition to this the committee will also assess/ evaluate the surveys/ studies and implementation of the required plans and their monitoring in compliance with conditions of the environmental clearance granted to the projects by the Central Government and ground realities to be verified by undertaking field visit to the project areas.

2. Accordingly a committee with the following composition is constituted:

1. Dr Devendra Pandey, - Chairman  
Director General  
Forest Survey of India  
Kaulagarh Road, P.O.- IPE  
Dehradun-248195
2. Dr C.K. Varshney  
Prof. C. K. Varshne  
88, Vaisali Pitampura  
Delhi-
3. Dr B.P Das,  
717, Sahid Nagar  
Bhubaneshwar-751007  
Orissa.

4. Dr A.K. Bhattacharya,  
Flat No. 805.  
Pocket – 3, Akshardham Apartments  
Sector – 19, Dwarka  
New Delhi - 110075
5. Dr Shekhar Singh  
Director  
Samya  
Centre for Equity studies  
C – 17 A, DDA Flats  
Munirka, New Delhi -110067
6. Dr Pawan Kumar ,Director-(Environment),  
~~Narmada Control Authority~~  
Narmada Sadan, Sector B  
Scheme No. 74, Vijay Nagar  
Indore-452010
7. Chief Conservator Forests  
Ministry of Environment and Forests  
Regional office (WZ),  
E-5, Arera Colony, Bhopal

\*The Chairman can co-opt members/experts as considered necessary.

One representative from each party state shall be associated on the issue concerning assessment work /field visit pertaining to that state and he would arrange all necessary maps/ charts/ data and field visit to the areas identified by the committee.

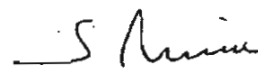
Director Environment, NCA would arrange to provide all necessary documentations/ records available with NCA to the Committee for their perusal and reference.

### 3. TERMS OF REFERENCE

- i. The committee would examine adequacy of the survey/ studies/ planning/ implementation and monitoring of the required plans in the light of the relevant provisions contained in the NWDT Award from environmental angle and/or conditions contained in the order of clearance issued to the SSP and ISP by the MOEF and clarifications/assurances given by the project authorities while seeking clearances. The Committee would also focus on the issues brought out by the members of the Environment Sub-group from time to time and would make appropriate recommendations on the assessment of compliances.
- ii. The committee shall meet as often as necessary and shall also undertake field visit to the areas, during reviews of the plan/implementation. The

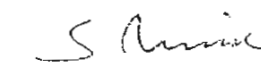
committee will interact with officers/ experts of SSNNL/NVDA/Concerned organisations of the Rajasthan and Maharashtra for appraisal/ assessment. The committee would also consider constraints and compulsions of the executing agencies, views of the inhabitants of the impacted areas.

- iii. Initially the committee is expected to undertake assessment work relating to mitigation of impacts generated by raising of the piers and overhead bridge of Sardar Sarovar Project, within 3 months time. After assessing the report, tenure of the committee may be reviewed.
- iv. The committee could use the modern technologies and data bank in their work and would also review/ develop indicators and mechanism for long term monitoring of implementation of the plans on parameters like, command area/ downstream and conservation of aquatic ecosystem, within the ambit of the order of clearance/ responsibilities entrusted to the environment Sub Group.
- v. The TA/DA and sitting fees of non-official members of the committee will be borne by the Ministry of Environment and Forests as per rules of Government of India. Apart from TA/DA, sitting fees of Rs.1000/- (Rupees one thousand only) will be paid to each participating non-official members and special invitee/ co-opted members for the meeting of the committee. For official members expenditure towards T.A./D.A. etc should be borne by the respective departments from their own budgets. In case for any disparity in claims, Member Secretary of the Committee shall be the controlling officer/authority for regulating their claims.

  
(Dr. S Bhowmik)  
Additional Director

Copy to:

1. Secretary, Ministry of Environment & Forests, & Chairperson, Environment Sub-group of NCA, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi - 110 003 for favour of information, please.
2. Secretary, Ministry of Water Resources, & The Chairperson, NCA, Shram Shakti Bhavan, Rafi Marg, New Delhi - 110 001 for favour of information, please.
3. The Chairman & Managing Director, Sardar Sarovar Narmada Nigam Limited, Block No-12, 1<sup>st</sup> Floor, New Sachivalaya Complex, Gandhinagar - 382010.
4. The Vice-Chairman, Narmada Valley Development Authority, Narmada Bhawan, Tulsi Nagar, Bhopal- 462003.
5. The Principal Secretary (Environment), Govt of Maharashtra, Mantralaya, Mumbai.- 38.
6. The Secretary (Env), Sachivalaya, Jaipur- 302005, Rajasthan.
7. Executive Member, NCA Narmada Sadan , 74, Vijay Nagar, Indore-452010.
8. All members of the committee.

  
(Dr. S Bhowmik)  
Additional Director



Annexure XLV11 - 4

Extract from Agenda of 80th Meeting of NCA  
held on 12-08-2008

Item No. LXXX-15 (801)- CONSTITUTION OF A COMMITTEE BY MINISTRY OF ENVIRONMENT & FORESTS FOR ASSESSMENT OF SURVEY/STUDIES/PLANNING AND IMPLEMENTATION OF THE PLANS ON ENVIRONMENT SAFEGUARD MEASURES FOR SARDAR SAROVAR & INDIRA SAGAR PROJECTS

Ministry of Environment & Forests (MoEF) vide O.M. No. 3-87/80-IA-I dated 09.07.2008 (Annexure-LXXX-19) has constituted a Committee for assessment of Survey/Studies/Planning and implementation of the plans on Environment Safeguard Measures for Sardar Sarovar & Indira Sagar Projects. Dr. Devender Pandey, Director, Forest Survey of India, Dehradun has been made the Chairman of the said Committee with the Chief Conservator of Forests, Regional Office, MoEF, Bhopal as the Member Secretary. Dr. Pawan Kumar, Director (Environment), NCA has also been made a Member of the said Committee with the provision that he would arrange all necessary documents / records available with NCA to the Committee for their needful.

It has also been stipulated that the expenditure towards Sitting Fee / TA/DA etc., for the non official Members would be borne by the Narmada Control Authority and Member Secretary of the Committee shall be the controlling officer/authority for regulating their bills.

In this connection, it is brought out that NCA is funded by the party States of Gujarat, Madhya Pradesh, Maharashtra and Rajasthan. Hence, bearing of the expenditure towards Sitting Fee / TA/DA etc., for the non official Members by the NCA would require approval by the Narmada Control Authority.

Also, as per Narmada Water Scheme, the NCA Fund can be operated/ regulated only by Executive Member/ Other Officers of NCA so authorized by NCA. Govt. of Madhya Pradesh vide letter no. NVDA/E&F/Tech/08/1114 dated 21/7/08 (Annexure-LXXX-20) has stated that "the issue of cost of Committee visit to be borne by NCA may kindly be decided in the 80<sup>th</sup> meeting of NCA as it involves monitoring/visit of ISP areas also."

Following observations / comments are made on the constitution of the Committee;

- (i) The environmental clearance order of MoEF of 24th June, 1987 specify that The Narmada Control Authority (NCA) will ensure that environmental safeguard measures are planned and Implemented pari passu with progress of work on projects.
- (ii) As per Narmada Water Scheme, the power to constitute Sub Group / Sub Committees, etc., lies only with the Authority. All Sub Groups / Sub Committees, etc., including Environment Committee, High Level Expert Group on Fisheries Development & Conservation have been formed with the approval of the Authority only.
- (iii) The Terms of Reference of the said Committee constituted by MoEF are similar to those of the existing Environment Committee constituted by NCA. The Environment Committee is functional, and as such, the said Committee would have overlapping of functions.
- (iv) The Hon'ble Supreme Court has observed in its Majority Judgement dated 18 October 2000 in Writ Petition (Civil) No.319 of 1994 (AIR 2000 SC 3751) that  

*"129. There is no reason whatsoever as to why independent experts should be required to examine the quality, accuracy, recommendations and implementation of the studies carried out. The Narmada Control Authority and the Environment Sub-group in particular have the advantage of having with them the studies which had been carried out and there is no reason to believe that they would not be able to handle any problem, if and when, it arises or to doubt the correctness of the studies made."*
- (v) In the Environment Sub Group in its 46th meeting held on 20th June, 2008, the Chairperson directed to constitute a Committee in respect of Sardar Sarovar Project only. But the Terms of Reference of the said Committee includes Indira Sagar Project. The Govt. of Madhya Pradesh has been agitating that environment Sub Group should not monitor the environment safeguard measures of Indira Sagar Project. The Govt. of Madhya Pradesh has already submitted an agenda with regard to Indira Sagar Project for discussion in the meeting of Narmada Control Authority.
- (vi) In view of the submission by the Govt. of Gujarat vide DO letter no. SSNNL/MD/NCA/15/2008 dated 26th June, 2008 (Annexure-LXXX-21) addressed to the Chairperson, ESG & Secretary (E&F) that considering the flood routing effect due to Indira Sagar Project, there would not be any additional submergence, the matter has already been referred to the Technical Committee constituted by NCA under the chairmanship of Chief Engineer, Central Water

Commission to review backwater levels of Sardar Sarovar Project. It would be appropriate to wait for the findings of this Technical Committee.

The Ministry of Environment & Forests has been requested to keep the said Committee in abeyance till the matter is reviewed by the Narmada Control Authority.

The Authority may like to deliberate and decide.

Annexure - XLVII-5

Extract from the Minutes of 80th Meeting of NCA  
held on 12-08-2008

Item No. LXXX-15 (801)- CONSTITUTION OF A COMMITTEE BY  
MINISTRY OF ENVIRONMENT & FORESTS  
FOR ASSESSMENT OF SURVEY/  
STUDIES/PLANNING AND IMPLEMENTATION  
OF THE PLANS ON ENVIRONMENT  
SAFEGUARD MEASURES FOR SARDAR  
SAROVAR & INDIRA SAGAR PROJECTS

The Executive Member, NCA informed that MOEF has constituted a Committee for assessment of surveys/studies/planning and implementation of the plans on environment safeguard measures for Sardar Sarovar and Indira Sagar Project under the Chairmanship of the Director (FSI), Dehradun and the Chief Conservator of Forest, R.O., MOEF, Bhopal is its Member Secretary. He stated that the NCA Secretariat has requested the MOEF to keep the said committee in abeyance till the matter is reviewed by NCA.

The GoG representative stated that during the 46<sup>th</sup> meeting of Environment Sub-group, the additional afflux of 1.62 m. because of which the said Committee has been constituted, was not discussed and the duration/longevity of the Committee was also not discussed. It was only decided that the Committee would look into the progress of environment safeguard measures for next stage of construction of piers and overhead bridge and submit its report by the end of monsoon season. The Terms of Reference notified by MOEF exceeded the decision taken in the ESG. Extending the scope of the Committee to report on the progress of environmental safeguard measures upto FRL makes it an unending process. He pointed out that as the Backwater Technical Committee of CWC has come out with lower afflux levels corresponding to 121.92 m. than earlier considered by the ESG, there is no need for the Committee to study the environmental safeguard measures corresponding to the construction of piers & bridge afresh. The GoG representative further stated that the Members of Environment Sub-Group should not be included in the Committee.

The Chairman, NCA wanted to know the basis of arriving at the figure of 1.62 m. of additional submergence in the minutes of 45<sup>th</sup> meeting. Representative of MOEF stated that this was indicated by one of the Independent experts of the ESG.

The GoMP representative objected to inclusion of Indira Sagar Project in the scope of the Committee as this was not discussed during the meeting. GoMP has also brought an additional Agenda item for not monitoring Indira Sagar Project by Environment sub-group of NCA.

The MOEF representative stated that it was decided during the 46<sup>th</sup> meeting to assess afresh the status of implementation of the requisite plans for addressing the implementation of environmental safeguard measures by constituting a committee by MOEF. This Committee would submit its report within 3 months in respect of construction of piers & overhead bridge and within 6 to 9 months in respect of raising dam height upto FRL. These reports would be reviewed by the Environment Sub-Group before permitting any further construction.

The Chairman, NCA observed that considering the stand taken by the party States and the report of CWC on backwater corresponding to construction of piers and overhead bridge, which was circulated during the meeting (Annexure LXXX-Min. 5) it would be in the fitness of thing if the issue of constitution of the Committee is referred back to the Environment Sub-Group for reconsideration.

The Authority decided to refer the issue of constitution of the Committee by MOEF to the Environment Sub-Group which will consider the issues raised by the NCA Secretariat and the party States in this regard.

Annexure-XLVII-6BY HAND

F. No.3-87/80 -IA.I  
Government of India  
Ministry of Environment and Forests  
IA.I Division



Paryavaran Bhawan  
CGO Complex, Lodhi Road  
New Delhi -110 003

Date :- 05.03.2009

The Secretary &  
Chairman, NCA  
Ministry of Water Resources  
Shram saakti Bhawan  
Rafi Marg  
New Delhi - 1

*copy for*  
Subject: The report of the committee constituted by the Ministry of Environment and Forests for assessment relating to mitigation of impacts generated by raising of the piers and overhead bridge of Sardar Sarovar Project - regarding.

*17/3/09*  
*20/3/09*  
*21/3/09*  
*22/3/09*  
The committee constituted by the Ministry of Environment and Forests vide O.M. No.3-87/80-IA.I dated 9<sup>th</sup> July, 2008, superseded by O.M. of even number dated 2<sup>nd</sup> September, 2008, submitted its report. Though it is written interim report, however, it is final report in respect of first part of the Terms of Reference on raising piers and overhead bridge construction of Sardar Sarovar Project.

A copy of the above mentioned report is enclosed herewith for your kind information and necessary action.

Yours faithfully,

*S. Bhowmik*  
(Dr. S. Bhowmik)  
Additional Director

13 February 2009

**INTERIM REPORT**

**Sub: ASSESSMENT OF SURVEY /STUDIES /PLANNING AND IMPLEMENTATION OF THE PLANS ON ENVIRONMENTAL SAFEGUARD MEASURES FOR SARDAR SAROVAR & INDIRA SAGAR PROJECTS**

The Ministry of Environment & Forests, Government of India vide O.M. No. 3-87/80-IA-I, dated 09.7.2008 superseded by O.M. of even number dated 02-09-2008 has constituted a Committee for assessment of survey/ studies/planning and implementation the plans on environmental safeguard measures for Sardar Sarovar & Indira Sagar Project. One of the time bound tasks is to assess the work relating to mitigation of impacts generated by raising of the piers and overhead bridge of Sardar Sarovar Project.

As a follow up, the Committee has held three meetings and one field visit until now. In the 1<sup>st</sup> meeting held on 25<sup>th</sup> September 2008 at NCA HQ Indore, the participating States of Gujarat, Madhya Pradesh, Maharashtra and Rajasthan made presentations. The Committee sought information from the States on updated progress report on the environmental safeguard measures and report on Back Water Level calculations of Central Water Commission (CWC) available in the Environment Wing of the NCA. In the 2<sup>nd</sup> meeting held on 8<sup>th</sup> Dec. 2008 at the Ministry of Environment & Forest, New Delhi, the report submitted by the States, the Back Water Level studies by CWC and a recent study report of NCA was reviewed and future course of action was decided. The committee undertook field visits to the sample area in the command in Gujarat and catchment in Madhya Pradesh, during 8<sup>th</sup> to 11 January 2009. In the third meeting held on 12<sup>th</sup> Jan 2009 at Ministry of Environment & Forests, New Delhi the committee summarized the observations of the field as well as discussions held with officials of the SSNNL in Gujarat and NVDA in Madhya Pradesh and decided to submit an interim report providing the committee's final view on the issue of raising piers and overhead bridge of Sardar Sarovar Project.

The committee also reviewed relevant sections of the Narmada Water Dispute Tribunal Awards, records of various meetings of the Environmental Sub-Groups, reports

of the Back Water calculations done by CWC in 1984 as well as by NCA in 2008 and various communications received from SSNNL.

## THE RECOMMENDATIONS OF THE COMMITTEE

**(A) The Report on the revised Back Water Levels calculations as submitted by NCA is not acceptable as it violates the NWDTA on following accounts:**

- (i) Firstly, because the award directed that calculations of Back Water Levels be done resulting from the Maximum Water Level of 140.21 meter (460 feet) at Sardar Sarovar dam. However, the computation for Back Water Levels by the NCA (June 2008) has been done with the maximum level of 137.17 meter at the dam site.
- (ii) Secondly, the Back Water Levels calculations are to be carried out by the Central Water Commission (CWC) as per the award and not by a sub-committee of the NCA even if one member in the sub-committee is from CWC as has been done in the instant case.
- (iii) Thirdly, since the dam is already designed and constructed for discharging the highest flood (30.7 Lakh cusecs), calculations of Back Water Levels corresponding to the observed flood of 24.5 Lakh cusecs (reduced to 16.9 Lakh cusecs upon routing) are not applicable.
- (iv) As per the award of NWDT and stipulations of clearances (environment, forests and investment) accorded to the project by the Central Government, the E & R planning needed a higher level of flood protection. Thus the use of outflow of moderated flood from ISP of 10 Lakh cusecs for determining of BWL by the NCA sub committee is unsafe for planning of R&R and environmental issues as the rehabilitation and environmental safeguard measures have to be complied with respect to submergence caused by Back Water of highest flood.



(B) The revised Back Water Levels calculations of NCA has many technical infirmities as indicated below:

(i) The report has used the highest flood at SSP to be 24 Lakh cusecs which is lower than 24.5 Lakh cusecs worked out for a return period of 100 Years. The highest flood for spillway design has to be the probable maximum flood for a dam of this size for a return of 10,000 years as specified under CWC guideline.

(ii) Against HEC IIB model used by CWC in its report of 1984 Back Water Level calculation, present study by NCA has used Mike-11 model (one dimensional analysis) on the ground of this being more advanced and robust. Such a model is applicable where the river valley is long and narrow and the flood wave characteristics over a large distance from the dam are required to be calculated. Whereas in the present case, the submergence in Sardar Sarovar Projects is wide spread to 1.77 km average width away from the main stream involving 245 villages.

(iii) Further, the strength of the MIKE 11 model lies in the application of its several modules, which require elaborate data collection and are compatible with Geographic Information System (GIS) through which the map of the areas to be submerged can be generated and used for planning purposes. Normally calibration of the model has to be done by simulating observed flows and matching simulated levels with observed levels at a number of locations. However, the NCA report has used only one location (at 224 kms upstream) which is highly inadequate. If the anticipated flood arrives following the construction of piers it may lead to disaster in the affected areas upstream.

(iv) The NCA report has used **single module Mike-11** model with input values of routed observed flood (less than 100 years) instead of routed design flood (1000 years). The model thus estimates lower submergence compared to the Back Water Levels determined by the CWC in their report of 1984 (corresponding to 100 years) and much lower submergence to the levels stipulated by the NWDT

award (1000 years). It is to be mentioned here that in the year 2005 CWC carried out similar study using Mike 11 model for Indira Sagar Project with routed design flood (1000 years) which has not been accepted by Hon'ble High Court of Madhya Pradesh, Jabalpur Bench in a PIL filed against this report (in case No WP 322 of 2005 dated.08.09.2006 2006(3) MPJR 218) and CWC has been asked to carry out the study again. The flood actually submerged more villages than could be explained by the study through Mike-11 model.

(v) Further, the values of various coefficients and parameters deduced in this study are at variance with the parameters adopted by the CWC in their report of 1984. The study also mentions that these values are yet to be firmed up/ notified by the CWC. The CWC in their study of 1984 on Back Water levels calculation has adopted Coefficient of rugosity 'n' to be 0.028 for river channel, 0.06 for over bank and Eddy loss coefficient 'K' as 0.3 for gradually diverging reaches and 0.1 for gradually converging reaches, whereas the NCA report of June 2008 has used 0.024 for rugosity 'n' for river channel and 1.5 times of it (0.036) for over bank. This results in a lower computed value of the submergence level.

(vi) **The committee is unable to accept the NCA report on Back Water Levels calculations** considering the stipulations of NWDT award mentioned earlier, the choice of the model, the application of modules with limited data and limited calibration, and the use of coefficients and parameters without verification and firming up by CWC. There is also no submergence map prepared depicting the area, thus it cannot be used for the purpose of planning for the environment and for rehabilitation.

**(C) Issues Relating to Status of Compliances with the requirements of environmental control corresponding to BWL of highest observed flood, as per NWDT award:**

(i) The Committee noted that the recommendation for raising the dam height at Sardar Sarovar up to 121.92 meters by the Environment Sub-Group (ESG) in its

41st meeting held on 6 Jan 2005 was despite the fact that full compliance with the stipulated environmental conditions and requirements was admittedly not there. It is evident from the minutes of the said meeting that the ESG recommended raising of height on the basis of the assurance given by the project authorities that all the pending work would be completed by the end of March 2005. However, there is no evidence or verification reports to indicate whether the assurances were complied with corresponding to the backwater levels.

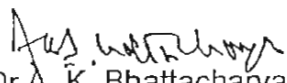
(ii) The committee had requested the party states in October 2008 to provide the latest compliance status relating to the environmental safeguards, but only NVDA from Madhya Pradesh submitted the same, and that too rather vaguely. For example, against various items of works it has been mentioned that substantial progress has been made, but without detailed evidence. All the states are again being requested to provide the status report.


(iii) The committee reviewed the various prescribed safeguards and conditions of clearance and determined that the status of some could best be determined by examining the concerned papers, others required field visits, and the remaining required independent assessments, including remote sensing assessments. The committee is pursuing each of these.

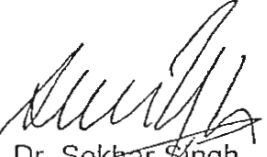
(iii) Accordingly, the Committee decided to interact with the major stake holders during the 2nd week of January, 2009 and undertook field visits, inspected works carried out on the dam site, and visited indicative limited sample areas where development of conveyance of irrigation system was in progress in the Command area of SSP. The Committee, though wanting to, but could not inspect the downstream areas of the SSP in Gujarat. The sample health facilities were also inspected by the expert member of the Committee, besides sample sub-watershed treated in catchment areas in Madhya Pradesh. The Committee held preliminary discussions with project authorities of the SSNNL and NVDA besides interaction with limited project affected

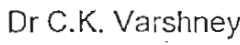
families in Gujarat and Madhya Pradesh, and the leaders of Narmada Bachao Andolan.

- (v) The assessment work relating to mitigation of impacts generated by raising of the piers and overhead bridge of Sardar Sarovar Project is progressing. A study of the available documents, coupled with the Committee's interaction with the Project Authorities/ affected people / representatives strongly suggested that there were major shortfalls in compliance with the prescribed environmental conditionality and requirements. Further observations of the Committee in this regard would be presented, after due assessment, in its subsequent report.


  
Dr A. K. Bhattacharya  
( Member)

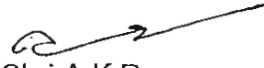
  
Dr. B.P. Das  
( Member)

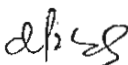
  
Dr. Sekhar Singh  
(Member)

  
Dr C.K. Varshney  
( Member)

Dr R.C, Sharma  
(Member)

  
Dr Pavan Kumar  
( Member)

  
Shri A.K.Rana  
(Member Secretary)

  
Dr. D. Pandey  
(Chairman)



# नर्मदा नियंत्रण प्राधिकरण

## NARMADA CONTROL AUTHORITY

(Ministry of Water Resources, Govt. of India)



No.NCA/M(E&R)/08-09/ 385

24<sup>th</sup> March 2009

To

The Commissioner (PR),  
Ministry of Water Resources,  
Shram Shakti Bhawan,  
Rafi Marg,  
New Delhi-1.

Sub:- The report of the Committee constituted by the Ministry of Environment and Forests for assessment relating to mitigation of impacts generated by raising of the Piers and Overhead bridge of Sardar Sarovar Project – reg.

Sir,

Please refer to MoEF letter No.3-87/80-IA.I dated 05.03.2009 on the above mentioned subject. The comments of NCA Secretariat on the final report of the MoEF Committee in respect of first part of the Terms of Reference on raising of piers and overhead bridge construction on Sardar Sarovar Project is enclosed herewith for favour of your kind information and further necessary action, please.

Yours faithfully,

( M.K Sinha )  
Member (Civil)/(E&R)

Encl:-As above.

S/c

NOO

Copy along with copy of the above mentioned MoEF Committee Report and comments of NCA Secretariat forwarded for kind information and further necessary action to:-

- 1) The Chairman, Central Water Commission, 3<sup>rd</sup> Floor, Sewa Bhawan, R.K Puram, New Delhi-66.
- 2) The Managing Director, Sardar Sarovar Narmada Nigam Ltd., Block No.12, 1<sup>st</sup> Floor, New Sachivalaya Complex, Gandhinagar.
- 3) The Vice Chairman, Narmada Valley Development Authority, Narmada Bhawan, 59, Arera Hill, Jail Road, Bhopal.
- 4) Shri V.C Shelke, Chief Engineer, Kyona Project, GoM, Sinchan Bhawan, Mangalwar Peth, Pune-411011.
- 5) Shri Vridhi Chand, Chief Engineer, Narmada Canal Project, Sanchores, Rajasthan.
- 6) The Chief Engineer (NBP), Central Water Commission, Wing-I (2<sup>nd</sup> Floor), West Block-II, R.K Puram, New Delhi-66.
- 7) The Chief Engineer, Narmada Control Authority, Indore.

( M.K Sinha )  
Member (Civil)/(E&R)

S/c

Narmada Sadan.  
Sector B, Scheme No. 74,  
Vijay Nagar, Indore-452 010 (M.P.)

नर्मदा सदन, सेक्टर बी, स्कीम नं. 74,  
विजय नगर, इन्दौर - 452010 (म.प्र.)

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E-mail : exe.mem.nca@nic.in

## Narmada Control Authority

### COMMENTS ON THE REPORT DATED 13.2.2009 OF MoEF COMMITTEE ON ASSESSMENT OF SURVEY / STUDIES / PLANNING AND IMPLEMENTATION OF THE PLANS ON ENVIRONMENTAL SAFEGUARD MEASURES FOR SARDAR SAROVAR AND INDIRA SAGAR PROJECTS

#### (I) GENERAL OBSERVATIONS / COMMENTS

1. The Ministry of Environment & Forests (MoEF), Govt. of India vide O.M. No. 3/87/80-IA.I, dated 9.7.2008 superseded by O.M. of even no. dated 2.9.2008 had constituted a Committee to examine the adequacy of the survey, studies, planning, implementation and monitoring of the required plans in the light of the relevant provisions contained in the NWDT Award from environmental angle and/or conditions contained in the order of clearance issued to the Sardar Sarovar Project (SSP) and Indira Sagar Project (ISP). One of the time bound tasks was to assess the work relating to mitigation of impacts generated by raising of piers & overhead bridge of SSP. MoEF O.M. had also indicated that the construction of piers and overhead bridge for SSP would cause additional submergence of 1.62 m. The Committee was required to undertake assessment work relating to mitigation of impacts generated by raising of the piers & overhead bridge of SSP.
2. MoEF in its forwarding letter No.3-87/80-IA.I, dated 5.3.2009 has clarified that though it is written interim report, however, it is **final report** (emphasis added) in respect of first part of the Terms of Reference (TOR) on raising piers & overhead bridge construction of SSP.
3. The MoEF Committee has made comments on backwater calculations of June 2008. The June 2008 report of CWC pertains to backwater levels corresponding to Full Reservoir Level, whereas the CWC studies of August 2008 deal with the impacts of raising of the piers & overhead bridge of SSP, which was discussed in the 80<sup>th</sup> meeting of NCA held on 12.08.08.

#### (II) PARAWISE OBSERVATIONS / COMMENTS

- (A) The Committee has observed that the report on the revised backwater levels calculation as submitted by NCA is not acceptable as it violates the NWDTA on four accounts. The parawise observations are as under;
  - (i) It is alleged that computation of Back Water levels have been done with the maximum level of 137.17m at the dam site instead of Maximum Water Level of 140.21m. The backwater levels are rise in water levels upstream of the reservoir due to an incoming flood. The NWDT Award did not specify the flood magnitude for which the backwater levels are to be worked out. NCA in its 12th meeting held on 27.10.1983 defined the 'highest flood level' as the 'maximum recorded flood of 24 lakh cusecs'. At

// Not true

the same time, NWDT did specify procedure for flood control at SSP (Chapter-XI, Vol.II of NWDT Report). These are reproduced below;

11.16.1 ..... The 1970 flood, occurring in September, was the highest on record at Garudeshwar.....

11.16.2 .....Gujarat has stated and Madhya Pradesh has tacitly accepted that the 1970 peak flood discharge at Garudeshwar was 24.5 lakh cusecs. But Maharashtra has contended that it should be taken to be 18.375 lakh cusecs. It is evident that the peak discharge figure of Gujarat errs on the high side. It is, however, difficult to quantify the exact extent of the error.

11.16.5 .....Madhya Pradesh has claimed in exhibit MP-515 that on construction of all the major dams in the basin in that State, a flood of the magnitude of 1970 would get moderated to 6.86 lakh cusecs. For the reasons given in Annexure XI-3, we consider that this figure cannot be accepted, as it appears to be too low. **In our view, it would be feasible to restrict the outflow from Narmadasagar to 10 lakh cusecs without encroaching on the MWL +864' there in a flood of the magnitude of the 1970 flood.** However, the peak outflow would be higher in a design flood but can be restricted to about 13.5 lakh cusecs without encroachment on MWL at Narmadasagar. (emphasis added)

11.16.8 .....Therefore, the crucial period for flood moderation at Sardar Sarovar would be from mid August to 20th September. It would be a good working arrangement to keep the reservoir level during this period below +450'. For passing Maharashtra's estimated 1000-year flood of 24.99 lakh cusecs, the reservoir level would need to be lowered by 5 feet to +445' to receive the flood in order not to exceed MWL +460'. For passing Gujarat's 1000- year flood of 30.7 lakh cusecs without exceeding the MWL, it would be necessary to enlarge the spillway capacity by adding two more gates and bring down the reservoir level to + 440'. At the falling stage of the season's last flood, the reservoir can be replenished to FRL +455'. Should another flood occur the process will have to be repeated. (emphasis added)

11.16.9 Before the flood outflows from Narmadasagar reach Sardar Sarovar, there would be a time interval of 18 to 20 hours. It is presumed that there would be reliable communication between Narmadasagar and Sardar Sarovar regulating stations with more than one means, such as telephone, wireless and carrier system on high tension lines. Therefore, the lowering of Sardar Sarovar to the required level on a flood arriving at Narmadasagar should not be difficult or involve any risk. (emphasis added)

Hence, backwater levels, i.e., raise in water levels upstream of reservoir due to incoming flood has to be worked out by keeping the water level at 450', i.e., 137.17 m as per the NWDT award stipulations.

- (ii) The MoEF Committee has alleged that the backwater levels have been carried out by a Sub-committee of the NCA and not by Central Water Commission (CWC). Narmada Water Dispute Tribunal (NWDT) Award Clause-XI, Sub-Clause II(3) stipulates that *"the Backwater Level at the highest flood level in Sardar Sarovar shall be worked out by the Central Water Commission in consultation with Madhya Pradesh and Gujarat."* The decision of the NCA in its 78<sup>th</sup> meeting held on 03.05.2007 regarding the review of the Backwater Level through a Technical Committee comprising of representatives of Central Water Commission, Narmada Control Authority and Party States was to facilitate consultation process as mandated by NWDT Award. The Backwater Levels have been worked out by CWC after necessary consultation process through the mechanism of Technical Committee.
- (iii) The MoEF Committee has stated that since the dam is already designed and constructed for discharging the highest flood (30.7 lakh cusecs), calculation of Back Water Levels corresponding to observed flood of 24.5 lakh cusecs (reduced to 16.9 lakh cusecs upon routing) are not applicable.

In this connection, it is brought out that dam is designed for the maximum probable (rarest of the rare) flood event keeping in view the safety of the structure and of the population downstream. The same principle cannot be adopted for working out the extent of backwater level to be arrived at for the purpose of acquisition of buildings and appurtenant land. NWDT Award stipulates acquisition of all land and properties upto full reservoir level but only buildings & appurtenant lands above full reservoir level to the backwater levels. The extent of limited acquisition in the backwater zone is keeping in view the temporary and occasional nature of submergence in the backwater zone.

- (iv) The MoEF committee has observed that as per the Award of NWDT and stipulations of clearances (environment, forests and investments) accorded to the Project by the Central Government, the E & R planning needed a higher level of flood protection. In the case of SSP, NCA has considered 1 in 100 years' return period flood for the purpose of E&R planning.

As regards, the use of outflow of moderated flood from ISP of 10 lakh cusecs, it is as per stipulation of NWDT in para 11.16.5 (Chapter-XI, Vol.II of NWDT Report) already reproduced above.

- (B) The MoEF Committee has referred the revised backwater levels calculations as those of NCA. As already pointed out above that the Backwater Levels have been worked out by CWC in accordance with NWDT stipulations and NCA decisions, after carrying out necessary consultation process as mandated by NWDT Award through the mechanism of Technical Committee. Further, Central Water Commission is the apex technical body in the field of water resources. In case, any clarification of technical nature is needed, the same could be obtained from CWC. CWC has already explained the rationale behind their technical decisions in their Final Report.



The parawise comments / observation on the allegations contained in the MoEF Committee Report are as under;

- (i) The MoEF Committee has stated that the highest flood for spillway design has to be the probable maximum flood for a dam of this size for a return of 10,000 years as specified under CWC guidelines. Magnitude of flood to be adopted for spillway design and magnitude of flood for backwater studies are two separate issues. The reason for adoption of 24 lakh cusec flood for backwater studies have already been explained in (A) above.
- (ii) The allegation by MoEF Committee regarding use of MIKE 11 model being one dimensional is not clear. The earlier model HEC-IIB used by CWC in 1984 was also one dimensional model. Moreover, it is CWC, who had decided to use MIKE 11 model (one dimensional analysis) after careful consideration as brought out in the Minutes of first meeting of the Backwater Technical Committee (item no. BSC-I-4(4), appended in the Final Report). It would be pertinent to mention here that the length of Sardar Sarovar reservoir is about 224 km against width of only 1.77km making length to breadth ratio of 126. Therefore, Sardar Sarovar reservoir is essentially one-dimensional.
- (iii) The model calibration has already been explained in para 4.2 of the Final Report. In fact, the data for three locations were made available to CWC, but data of only one station could be used as the data of other two locations were found inconsistent primarily due to those locations coming under submergence/ backwater effects. // how the model can be trusted
- (iv) The MoEF Committee had commented on the use of routed observed flood instead of design flood. The NWDT Award did not specify the flood magnitude for which the backwater levels are to be worked out. NCA in its 12th meeting held on 27.10.1983 decided the 'highest flood level' as the 'maximum recorded flood of 24 lakh cusecs'. As regards the use of routed flood, the stipulation of the NWDT Report (Chapter-XI, Vol.II para 11.16.4 page 32) is being reproduced below;

*"The maximum observed flood (1970) at Sardar Sarovar and in consequence the derived 1000 year flood, there has two components, namely, the inflow from the catchment above Narmada Sagar and that from the catchment below it. The former would get moderated on the construction of Narmada Sagar and upper dams but not the latter. In considering the MWL at Sardar Sarovar, 1000 year design flood to be taken into account should be the moderated outflows from Narmada Sagar and unmoderated inflows from the catchment below Narmada Sagar".*

Thus, use of routed flood was prescribed by NWDT.

Further, the MoEF Committee had stated that the Hon'ble High Court of Madhya Pradesh at Jabalpur has not accepted the CWC report (2005) in

WP 322 of 2005 dated 08.09.2006 and CWC has been asked to carry out the study again. The case referred to is probably the order dated 08.09.2006 in WP 3022 of 2005 of Hon'ble High Court of Madhya Pradesh at Jabalpur Narmada Bachao Andolan Vs. Narmada Hydro-Electric Development Corporation and Ors. The Hon'ble High Court of Madhya Pradesh at Jabalpur has, in fact, relied on the CWC backwater study and ordered review of persons and the houses which are likely to be affected by the back water level by CWC, which was later on carried out with the help of Survey of India, as CWC is not the survey agency.

- (v) The MoEF committee has commented on the values of coefficients and modeling parameters by CWC. As already indicated earlier that Central Water Commission is the apex technical body in the field of water resources and selection of appropriate values of coefficients and modeling parameters should be left to CWC. The Backwater Technical Committee in its fourth meeting 12.02.2008 (appended to Final Report, June 2008) had decided that CWC may take appropriate decision with regard to model parameters, e.g., Manning's 'n' coefficient, etc., to best simulate the actual conditions. CWC has decided on coefficients and modeling parameters after carrying out necessary model calibration.
- (vi) The MoEF committee has observed that it is unable to accept the NCA report on Back Water Levels Calculation. As indicated earlier, it is the Central Water Commission, which is mandated by the NWDT Award to work out the backwater calculations in consultation with Madhya Pradesh and Gujarat.

The MoEF Committee has further stated that there is no submergence map prepared depicting the area. The Govt. of Gujarat has, in fact, prepared the submergence map, which has been forwarded to all the party States for review of Environment and R&R planning.

- (C) The MoEF Committee has considered the issues relating to Status of Compliances with the requirements of environmental control corresponding to BWL of highest observed flood, as per NWDT Award. The parawise replies to the comments of the MoEF Committee on the issues relating to Status of Compliances with the requirements of environmental control are as under;
  - (i) The MoEF Committee has observed that there is no evidence or verification reports to indicate whether assurances were complied with corresponding to the backwater levels. In this connection, it is informed that Environment Sub Group under the chairmanship of the Secretary to the Govt. of India, Ministry of Environment & Forests has reviewed the compliance of environment safeguard measures in its 42<sup>nd</sup> to 46<sup>th</sup> meetings and also deliberated upon the reports of the Environment Committee of NCA. The agenda and minutes clearly highlight the progress towards implementation of environment safeguard measures. After review of the status, the Environment Sub Group in its 45<sup>th</sup> meeting had observed that

"It was decided that except for this there are no other major environmental issues in taking up further works on Sardar Sarovar Project without raising water levels, as far as Environment Sub-Group is concerned.

The Sub Group therefore recommended construction of piers and overhead bridge but NO installation of gates until further review. Construction of piers and overhead bridge will cause additional submergence of 1.62 mt. Environmental Safeguard Measures commensurate with this additional submergence should be completed in time."

- (ii) The MoEF Committee has stated that party States have not submitted the latest compliance report relating to the environment safeguards. It is informed that party States have been regularly submitting compliance report to NCA Secretariat. These reports are available with the Director (Environment), NCA, who is also a member of the MoEF Committee and had been regularly attending all its meetings.
- (iii) The MoEF Committee has so far only determined that the status of some could best be determined by examining the concerned papers, others required field visits and the remaining required independent assessments, including remote sensing assessments. It has only been stated that the Committee is pursuing each of these.
- (iv) No comment.
- (v) The MoEF Committee has concluded with the observation that a study of the available documents coupled with the Committee's interaction with the Project Authorities/ affected people/ representatives strongly suggested that there were major short falls in compliance with the prescribed environmental conditionality and requirements. However, the MoEF Committee has not indicated as to what were these major short falls in the compliance.

----- X -----

Annexure - XLV11-8

GOVT. OF MADHYA PRADESH  
Narmada Vally Development Authority

Letter No. 825/384/NYDA/E/W/08

Bhopal, Dated 13/4/2008

To,

The Chairman,  
Central Water Commission,  
Seva Bhawan, R.K. Puram,  
New Delhi.

Sub:- Phase I construction at SSP comprising raising of piers, construction of overhead bridge and installation of gates in open position.

Sir,

As you know a Technical Committee under the chairmanship of Chief Engineer CWC was constituted as decided in the 78<sup>th</sup> meeting of NCA held on 30.5.2007, to review the back water levels for the final height of Sardar Sarovar dam. The Technical Committee gave its report in June 2008.

2. The MOEF constituted a Committee in September 2008 to examine the adequacy of the survey, studies, planning, implementation and monitoring of the required plans in the light of the relevant provisions in the NWDT Award from environmental angle and/or conditions contained in the orders of clearance issued to the Sardar Sarovar Project (SSP) and Indirasagar Project (ISP). One of the time bound tasks entrusted to the said Committee of MOEF was to assess the work relating to mitigation of impacts generated by raising of piers and over head bridge of SSP.

The said Committee of MOEF has given its interim report on 5.3.2009 and has clarified that it is the final report in respect of first part of the Terms of Reference (TOR) on raising of piers and construction of over head bridge of Sardar Sarovar Project (SSP).

VC-S.4.09

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4. In this report, the said Committee of MOEF has without authority criticized the work done by the expert technical committee and the officers of CWC having experience in the matters of floods and back water computations when the said committee of MOEF has no technical expertise or experience on this subject dealt with by the Technical Committee. In this connection the letter of the Secretariat of NCA No. NCA/M(E&F)/08-09/385 dated 24.3.2009 sent to you may be referred to.

5. GOMP fully endorse the position brought out by the Secretariat of NCA in the said letter of the Secretariat of NCA forwarded by Member(Civil)/(E&R) NCA dated 24.3.2009. Further specific comments of GOMP on the interim report of the said committee of MOEF are enclosed for your information.

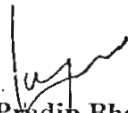
6. It has been already explained by the Secretariat of NCA in para A(ii) that the Technical Committee was to facilitate consultation process with the States as mandated in the NWDT Award and that the back water levels were worked out by CWC. The Secretariat of NCA has also mentioned in para (B) that CWC is the apex technical body in the field of water resources (including floods and back water computations) and that any clarification of technical nature could be obtained from CWC.

7. The said committee of MOEF has expressed in para B(vi) that it was unable to accept the report of the Technical Committee without verification and firming up by CWC.

8. It is therefore requested that a formal confirmation of the work done by the CWC through the Technical Committee may again be issued so that the comments of the Committee of MOEF are finally set at rest.

Encl – Comments of GOMP  
in ..... pages

Yours faithfully

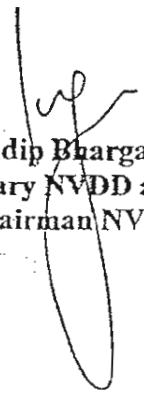
 9.4.09  
(Pradip Bhargava)  
Additional Chief Secretary NVDD and  
Vice Chairman NVDA

Endt. No. 826/384/NVDA/E/W/08 Bhopal, dated 12/04/09

Copy with a copy of the enclosures forwarded to :-

1. The Secretary to Government of India, Ministry of Water Resources, Shram Shakti Bhawan, Rafi Marg, New Delhi.
- ✓ 2. The Executive Member NCA, Narmada Sadan, Sector B, Scheme No. 74, Vijay Nagar, Indore 452010.
3. The Chief Secretary, Government of Maharashtra, Mantralaya, Mumbai (Maharashtra).
4. The Chief Secretary, Government of Gujarat, Gandhinagar, Gujarat.
5. The Chief Secretary, Government of Rajasthan, Jaipur.
6. The Managing Director, SSNNL, Block No. 12, 1<sup>st</sup> Floor, New Sachivalaya Complex, Gandhinagar, Gujarat.

Encl - as above.

  
(Pradip Bhargava)  
Additional Chief Secretary NVDD and  
Vice Chairman NVDA

9401

**Brief observations of GOMP on the Report of the Committee constituted by MOEF for assessment relating to mitigation of impacts generated by raising of the piers and over head bridge at SSP**

- (1) GOMP fully endorse the position brought out by the Secretariat of NCA in the letter of Member (Civil)/(E&R) NCA No. NCA/M(E&R)/08-09/385 dated 24.3.2009 addressed to the Commissioner MOWR.

It is presumed that the MOWR has forwarded the position to MOEF.

- (2) GOMP is of the considered opinion that back water computations is a highly technical subject and requires vast experience. The Committee constituted by MOEF without any expert member having experience in the subject should not have ventured in criticizing the work done by an expert and experienced body. It is advisable that the MOEF ignores the report of the said Committee on this aspect as it is without jurisdiction and without any authority.

- (3) Additional Comments of GOMP on the report of the said Committee are as under:-

Para in the report of the Committee of MOEF	Short point made out by the said Committee of MOEF	Specific comments of GOMP, in short
1	2	3
A	<p>The back water levels calculation violates the NWDT Award on four accounts.</p> <p>(i) The computations of back water levels have been done with the maximum level of 137.17 m instead of 140.21 m.</p>	<p>(A) The said Committee is interpreting the provisions in the NWDT Award without any basis. The following facts are note worthy:-</p> <p>(a) The NWDT Award did not specify the flood magnitude for which the back water levels are to be worked out for the purpose of submergence. The ISI standard of 1985 prescribes that for upstream submergence considerations, in general a 25 year flood for land acquisition and 50 year flood for built up property acquisition be adopted. Paragraph 4.2 of IS: 11223 - 1985 is reproduced below for ready reference:-</p>

		<p>"4.2 <u>Upstream submergence consideration</u> – This depends on local conditions, type of property and effects of its submergence. Except for very important structures upstream like power house, mines etc. for which levels corresponding to Standard Project Flood (SPF) or Probable Maximum Flood (PMF) may be used; smaller design floods and levels attained under those would suffice. In general a 25 year flood for land acquisition and 50 year flood for built up property acquisition may be adopted". (IS:11223 – 1985, page 10, para 4.2)."</p> <p>As compared to above position adoption of a flood of 100 years is on safer side.</p> <p>(b) In para 11.16.5, the NWDT Report has found that, "it would be feasible to restrict the outflow from Narmadasagar to 10 lakh cusecs".</p> <p>(c) In para 11.16.8 the NWDT Report has prescribed that,</p> <p>"The crucial period for flood moderation at Sardar Sarovar would be from mid August to 20<sup>th</sup> September. It would be a good working arrangement to keep the reservoir level during this period below 450 feet (137.17 m)."</p> <p>Thus the level of 137.17 m is provided in the NWDT Award.</p> <p>(d) The NWDT Award has provided that the four States could by agreement modify the provisions in the NWDT Award. (clause XIV, Sub-clause 17). Therefore the unanimous decision of NCA in which the four States participate has the force of amending the NWDT Award.</p>
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A(ii)	Back water levels are not calculated by CWC.	<p>A(ii) The allegation is unjustified. The back water calculations have been worked out by CWC. The NWDT Award has directed that "the back water level at the highest flood level in Sardar Sarovar shall be worked out by CWC in consultation with Madhya Pradesh and Gujarat". The review of back water levels by a technical Committee comprising representatives of CWC, NCA and party States was to facilitate consultation process as mandated by NWDT Award. Thus the methodology followed for review of back water levels by a expert technical Committee was as provided in the NWDT Award. More over the decision was taken by NCA in the 78<sup>th</sup> meeting to set up a technical committee unanimously with the four States participating in the meeting.</p> <p>It is the view of GOMP that the said committee of MOEF is only on the technicality of the matter when it says that back water levels are not calculated by CWC. As explained, the position is otherwise. If it satisfies the said Committee formal approval of Chairman CWC could be again obtained.</p>
A(iii)	The dam is designed for the highest flood (30.7 lakh cusecs). Calculations of back water levels for a flood of 24.5 lakh cusecs (moderated to 16.9 lakh cusecs) are not applicable.	<p>A(iii) The Committee has neither appreciated the difference between flood for design of dam and the flood for the purpose of submergence nor appreciated the difference between design flood (SPF) and check flood (PMF). The definitions of Probable Maximum Flood (PMF) and Standard Project Flood (SPF) are reproduced below to bring out the difference.</p> <p>(a) <b>Probable Maximum Flood (PMF)</b> It is the flood that may be expected from the most severe combination of critical meteorological and hydrological condition that are reasonably possible in the region and is computed by using the Probable Maximum Storm which is an</p>

estimate of the physical upper limit to maximum precipitation for the basin. This is obtained from transposition studies of the storms that have occurred over the region and maximizing them for the most critical atmospheric conditions.

(b) **Standard Project flood (SPF) -**

It is the flood that may be expected from the most severe combination of hydrological and meteorological factors that are considered reasonably characteristic of the region and is computed by using the Standard Project Storm (SPS). While transposition of storms from outside the basin is permissible, very rare storms which are 'not characteristic' of the region concerned are excluded in arriving at the SPS rainfall for the basin.

The main difference between the above two floods (PMF & SPF) is that maximization is applied (about 1.20. to 1.35 times) in the case of PMF which is not applied in the case of SPF and that the return period of SPF is generally 1000 years and that of PMF is generally 10,000 years. In the case of Sardar Sarovar the floods were worked out as given below:-

- |                  |   |                                   |
|------------------|---|-----------------------------------|
| (1) PMF          | — | 46.60 lakh cusecs (by World Bank) |
| (2) SPF          | — | <u>30.7 lakh cusecs</u>           |
| (3) Flood of a)- |   |                                   |
| return period }  |   | 24.5 lakh cusecs at Garudeshwar   |
| of 100 years }   |   | 24 lakh cusecs at SSP             |

A dam is designed to pass SPF but the design of the dam is also checked for passing PMF. Therefore SPF is called the design flood and PMF is called the check flood. This is clear from the approval of the Planning Commission

		<p>dated 6.9.1989 for the Indirasagar Project. In the salient features attached to the said approval of the Planning Commission this distinction between the two floods is clearly stated as under :-</p> <p>Design flood (SPF) – 0.835 lakh cumecs (28.5 lakh cusecs)</p> <p>Check flood (PMF) - 1.15 lakh cumecs (40.5 lakh cusecs)</p> <p>The Technical Committee for consultations between the concerned parties, recommended for the purpose of submergence a flood of the return period of 100 years (24 lakh cusecs) which is the maximum observed flood at SSP. This recommendation is unanimously approved by the 4 participating States in the 80<sup>th</sup> meeting of NCA. The said Committee of MOEF has no authority or jurisdiction to question this aspect.</p>
A(iv)	The E&R Planning needed a higher level of flood protection.	A(iv) – This is only the view of the said Committee of MOEF without any authority or justification. Actually the view of some of the elected representatives of the people in the area is that land should not be acquired upto FRL but the acquisition of land should be only upto that level which is attained generally every year by 15 <sup>th</sup> December as the reservoir is bound to get depleted after October upto 15 <sup>th</sup> December and the land coming out would be available for cultivation.
(B)	Technical infirmities	(B) The said Committee of MOEF is not a technical committee of any experience on the aspect of floods or back water and hence the technical infirmities mentioned by the said Committee need to be ignored.
B(i)	Probable Maximum flood (PMF) has to be used having a return period of 10,000 years as per CWC guidelines.	B(i) There are no such guidelines of CWC that PMF should be used for the purpose of assessing submergence and acquisition. It is very surprising that the said environmental Committee is pointing out to a technical committee constituted for consultations with CWC, that CWC guidelines prescribe PMF for this purpose.

		<p>It may be stated here that in W.P. 3022 of 2005 the NBA had also argued in the Hon'ble High Court that NWDT Award was applicable to Indirasagar project (ISP) and NWDT had said that back water should be calculated for "highest flood", that is maximum flood; so for Indirasagar project the back water should be calculated for PMF. The NBA added the word "Probable" on its own to "maximum flood" said to be mentioned in the NWDT Award. It was pointed out on behalf of the State to the Hon'ble High Court that by adding the word "Probable" the NBA has increased the return period of the maximum flood to about ten thousand years. In a subsequent letter to the Union Minister, MOWR dated 12.11.2006, NBA however, agreed that SPF may be the design flood for Indirasagar Project. The Hon'ble High Court, rejected the basic plea of NBA that NWDT Award was applicable to ISP. The short point is that without understanding the implications, the said Committee of MOWR is saying just as was done by NBA in the said W.P. 3022 of 2005 that PMF should be adopted for working out back water at SSP, for the purpose of submergence and is further saying that CWC has prescribed the same. This is paradoxical.</p>
B(ii) and B(iii)	<p>The submergence in Sardar Sarovar is wide spread to 1.77 km average width and that Mike II model is not applicable</p>	<p>B(ii) and B(iii) — This is non-factual. The SSP reservoir is a long reservoir with a length of 214 km as compared to the width of 1.77 km. In the selection of model for back water calculations the said Committee of MOEF is offering comments again without understanding the implications.</p>

B(iv)	Similar study using Mike -11 model for Indira Sagar was not accepted by the Hon'ble High Court in W.P. 3022 of 2005 filed against the report and CWC was asked to carryout the report again.	B(iv) This is also a non factual statement. The PIL (W.P. 3022 of 2005) was filed by NBA and was for stagnating the ISP by opposing filling of water in the ISP dam above crest under the alleged plea that R&R was not complete. It was not against the report of CWC on back water by using the model Mike - 11 as is made out by the said Committee of MOEF. The Hon'ble High Court directed as under in the judgement dated 8.9.2006 on the said W.P. on the aspect of back water:-  "110 (t) - The Central Water Commission shall study further with regard to the persons and the houses which are likely to be affected by back water level".
B(v)	The values of various coefficients and parameters have been reduced.	B(v) - This is a matter which must be left to be decided by the CWC which is an expert body in the Country. It is clear that earlier values of various coefficients and parameters were conservative.
B(vi)	NCA report on back water levels cannot be accepted without verification and firming up by CWC.	B(vi) This is a legitimate comment of the said Committee of MOEF as it has accepted that CWC is the highest technical authority in the matter in the country. It is already explained that the expert technical committee was set up by NCA only for consultations with the States as directed in the NWDT Award and actual work was done by CWC. However there is no objection to again get confirmation of the Chairman CWC for the work done by the Technical Committee.
C	"Highest observed flood as per NWDT Award" is used in the heading of para C by the said committee of MOEF.	C. This is the reasonable interpretation of the provision in the NWDT Award which uses the words "highest flood " for back water calculations.
C (i) to (iv)	There is no evidence or verification reports to indicate whether the assurances were complied with corresponding to back water levels.	C(i) to (iv) This is factually incorrect. In para C(iii) and (iv) the said committee of MOEF has itself said that the "Committee had preliminary discussions with project authorities of the SSNNL and NVDA besides inter action with limited affected

families in Gujarat and Madhya Pradesh and the leaders of Narmada Bachao Andolan" and that "the assessment work relating to mitigation of impacts generated by raising of the piers and over head bridge of Sardar Sarovar Project is progressing". The said committee has, however, put the cart before the horse and has said in para C(iv) at the end that, "A study of available documents coupled with the Committee's interaction with the project authorities/affected people/representatives, strongly suggest that there were major short falls in compliance with the prescribed environmental conditionality and requirements. Further observations in this regard would be presented, after due assessment in its subsequent report". It is clear that the said committee of MOEF has made statements about non-compliance and major short falls in this report without "due assessment" which can not be termed justifiable.

As pointed out by the Secretariat of NCA, "the party States have been regularly submitting compliance report to NCA Secretariat. These reports are available with the Director (Environment) NCA who was the Member of the said Committee of MOEF."

Only a statement that there were short falls cannot be replied to without any details on the short falls.

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Annexure XLVII-9

No. 7/6/2007/SSDC/188  
 Government of India  
 Central Water Commission  
 Office of the Chief Engineer (NBP)

West Block 2, Wing 1, 2<sup>nd</sup> floor,  
 R.K. Puram, New Delhi - 110066.  
 Dated the 19<sup>th</sup> October, 2009.

The Commissioner (PR)  
 Ministry of Water Resources,  
 Shram Shakti Bhawan  
 Rafi Marg, New Delhi.

KIND ATTENTION : SHRI C.S. SRIVASTAVA  
 C.E. N.C.A.  
 INDORE

Sub: Assessment of survey/studies/planning and implementation of the plans on environment safeguard measures for Sardar Sarovar and Indira Sagar Projects.

Please refer to MoWR letter No. 33/3/2008-PR dated 4<sup>th</sup> Sept., 2009 on the above subject. The interim/final Report of the MoEF Committee on the above subject received with your letter has been examined in the light of the back water level studies conducted in CWC for Sardar Sarovar Project.

The observations of MoEF are found to be related with the technical issues connected with the modalities of the back water studies. These observations are suitably replied in the enclosed Annexure which may be referred to.

It is to further inform that the studies conducted by CWC considered various parameters as deemed appropriate keeping the provisions of NWDT award in view.

Encl: As above.

*[Signature]*  
 19/10/09  
 (Ravinder Singh)  
 Chief Engineer (NBP)

For kind info. A.

Member CC,

*[Signature]*  
 29/10/09

## ANNEXURE

Enclosure to CWC letter No. 7/6/2007/SSDC/188 dated : 19th October, 2009  
 COMMENTS OF CWC ON THE OBSERVATIONS OF THE COMMITTEE OF MOEF

S.No.	Observations of the Committee of MOEF	Views of CWC
A(i)	Firstly, because the award directed that calculations of Back Water Levels be done resulting from the Maximum Water Level of 140.21 meter (460 feet) at Sardar Sarovar Dam. However, the computation for Back Water Levels by the NCA (June, 2008) has been done with the maximum level of 137.17 meter at the dam site. Secondly, the Back Water Levels calculations are to be carried out by the Central Water Commission (CWC) as per the award and not by a sub-committee of the Namada Control Authority (NCA) even if one member in the sub-committee is from CWC as has been done in the instant case.	NWDT in its award has stated in Article 11.16.8 <i>"The crucial period of flood moderation at Sardar Sarovar would be from mid-August to 20<sup>th</sup> September. It would be good working arrangement to keep the reservoir level during this period below +450 ft."</i> Therefore, 450 feet (137.17m) water level at dam site has been adopted for back water studies.
A(ii)		NWDT has given directions regarding submergence, land acquisition and rehabilitation of displaced persons as under ( Clause XI sub clause II (3)): <i>The backwater level at the highest flood level in Sardar Sarovar shall be worked out by the Central Water Commission in consultation with Madhya Pradesh and Gujarat.</i> As per these provisions, a sub committee was set up under the Chairmanship of Chief Engineer (NBP), CWC, and having representation from party states as well as NCA. The study was conducted in the RM Wing of CWC. Vide this office letter No. 7/6/2007/SSDC/194 dated 24.11.2008 (Annexure LXXXI -- 15 of Agenda for 81 <sup>st</sup> meeting of NCA), it has already been clarified that Central Water Commission had worked out afflux/backwater level at highest flood level in Sardar Sarovar Project (SSP) by carrying out the hydrodynamic modeling and submitted the Final Report vide this office letter no. 7/6/2007/SSDC dated 12 <sup>th</sup> June, 2008. The study has been carried out by CWC as per prevalent practice and state-of-the-art technology in the field after due consultation with the Govt. of M.P. and Gujarat through the deliberations in the Technical



		Sub Committee constituted for the purpose.
A(iii)	<p>Thirdly, since the dam is already designed and constructed for discharging the highest flood (30.7 Lakh cusecs), calculations of Back Water Levels corresponding to the observed flood of 24.5 Lakh cusecs (reduced to 16.9 Lakh cusecs upon routing) are not applicable.</p>	<p>CWC has considered all the provisions relating to the flood to be considered for the purpose of present back water studies as per NWDT award Clause no.11.16.2. <i>"Madhya Pradesh has tacitly accepted that the 1970 peak flood discharge at Garudeshwar was 24.50 lakh cusecs. But Maharashtra has contended that it should be taken to be 18.375 lakh cusecs. (See Exhibit MR-142). Gujarat, in arriving at the peak flood discharge of 24.50 lakh cusecs, has relied on a number of methods of computing it but Maharashtra has pointed out some lacuna in each. It is evident that the peak discharge figure of Gujarat errs on the high side. It is, however, difficult to quantify the exact extent of the error".</i> As such the study with 24.5 lakh cusecs is correct.</p>
A(iv)	<p>As per the award of NWDT and stipulations of clearances (environment, forests and investment) accorded to the project by the Central Govt., the E&amp;R planning needed a higher level of flood protection. Thus the use of outflow of moderated flood from ISP of 10 Lakh cusecs for determining of back water level (BWL) by the NCA sub-committee is unsafe for planning of R&amp;R and environmental issues as the rehabilitation and environmental safeguard measures have to be complied with respect to submergence caused by Back Water of highest flood.</p>	<p>As per the NWDT award Clause 11.16.5(Vol.II), <i>"In our view, it would be feasible to restrict the outflow from Narmadasagar to 10 lakh cusecs without encroaching on the MWL +864 therefore, in a flood of the magnitude of the 1970 flood".</i> NWDT Award does not stipulate backwater resulting from any other higher flood for the purpose of acquisition of land and property.</p>
B(i)	<p>The report has used the highest flood at SSP to be 24 Lakh cusecs which is lower than 24.5 Lakh cusecs worked out for a return period of 100 years. The highest flood for spillway design has to be the probable maximum flood for a dam of this size for a return of 10,000 years as specified</p>	<p>(i) NWDT in its award has contended that 1 in 100 years discharge of 24.5 lakh cusecs stated by Gujarat is on the higher side and the corresponding value of discharge by Maharashtra is only 18.37 lakh cusecs. As per NWDT award Clause No.11.16.2. <i>"Madhya Pradesh has tacitly accepted that the 1970 peak flood discharge at Garudeshwar was 24.50 lakh cusecs. But Maharashtra has</i></p>

	under CWC guideline.	<p>contended that it should be taken to be 18.375 lakh cusecs. (See Exhibit MR-142). Gujarat, in arriving at the peak flood discharge of 24.50 lakh cusecs, has relied on a number of methods of computing it but Maharashtra has pointed out some lacuna in each. It is evident that the peak discharge figure of Gujarat errs on the high side. It is, however, difficult to quantify the exact extent of the error".</p> <p>CWC has adopted a figure of 24 lakh cusecs which is very close to 24.5 lakh cusecs but well above the value as contended by Maharashtra.</p> <p>(ii) Further the design flood as per the orders of the NWDT is 30.7 lakh cusecs for which the spillway of the dam has been designed.</p> <p>(iii) The design of the dam confirms to IS: 11223, "Guidelines for fixing Spillway Capacity." As per the Clause No. 3.1.3 of this standard, the inflow design flood for safety of dam of storage capacity greater than 60 million m<sup>3</sup> and head greater than 30m, will be designated as large dam. This standard does not mention return flood of 1 in 10000 years</p>
B(ii)	Against HEC IIB model used by CWC in its report of 1984 Back Water Level calculation, present study by NCA has used Mike-11 model (one dimensional analysis) on the ground of this being more advanced and robust. Such a model is applicable where the river valley is long and narrow and the flood wave characteristics over a large distance from the dam are required to be calculated. Whereas in the present case, the submergence in Sardar Sarovar Projects is wide spread to 1.77 km average width away from the	<p>Mike-11 is a one dimensional mathematical simulation model. The HEC IIB model used by us in 1984 Back Water Level study is also a one dimensional model. As the Narmada Valley is a long and narrow valley with flood wave characteristic over a large distance from the dam are of main interest, one dimensional modeling was again adopted for the instant case and MIKE 11 software was used which is considered suitable in the present case.</p> <p>It is further to state that in back water study done using MIKE 11 Model, actual cross sections are adopted as input data, which reflect the dimensional proportions as they exist and are reflected in the model both longitudinally as well as transversely. Hence, there is no concern</p>

	main stream involving 245 villages.	as regards the applicability of the methodology used in CWC study.
B(iii)	Further, the strength of the MIKE 11 model lies in the application of its several modules, which require elaborate data collection and are compatible with Geographic Information System (GIS) through which the map of the areas to be submerged can be generated and used for planning purposes. Normally calibration of the model has to be done by simulating observed flows and matching simulated levels with observed levels at a number of locations. However, the NCA report has used only one location (at 224 kms upstream) which is highly inadequate. If the anticipated flood arrives following the construction of piers it may lead to disaster in the affected areas upstream.	As explained under B (ii) above, CWC has been using MIKE 11 extensively and finds it suitable and satisfactory. It is incorrect to say that only one location at 224 kms upstream has been considered.
B(iv)	The NCA report has used single module Mike-11 model with input values of routed <u>observed</u> flood (less than 100 years) instead of routed <u>design</u> flood (1000 years). The model thus estimates lower submergence compared to the Back Water Levels determined by the CWC in their report of 1984 (corresponding to 100 years) and much lower submergence to the levels stipulated by the NWDT award (1000 years). It is to be mentioned here that in the year 2005 CWC carried out similar study using Mike 11 model for Indira Sagar Project with routed design flood (1000 years) which has not been accepted by Hon'ble High Court of Madhya Pradesh, Jabalpur Bench	<p>(i) The Hon'ble High Court of Jabalpur of Madhya Pradesh on WP No. 3022/2005 dated 8.9.2006 has ordered under para (t) &amp; (u) that:</p> <p>(t) <i>The Central Water Commission shall study further with regard to the persons and the houses which are likely to be affected by the backwater level.</i></p> <p>(u) <i>The Grievance Redressal Authority and Central Water Commission would make close study whether the persons whose houses have been acquired barring the land whether it is justified or not, and if not so, recommend to the State Government for its appropriate decision."</i></p> <p>(ii) Position regarding WP No. 3022/2005 referred is reproduced as per the Hon'ble High Court of Jabalpur of Madhya Pradesh on WP No. 13919/2006 dated 7.10.2006 as under:</p>

<p>in a PIL filed against this report (in case No.WP 3022 of 2005 dated 08-09-2006 2006(3) MP JR 218) and CWC has been asked to carry out the study again. The flood actually submerged more villages than could be explained by the study through Mike-11 model.</p>	<p>'Narmada Bachao Andolan', an organization engaged in securing the just rehabilitation, legal and human rights of the oustees families affected by the large dam in the Narmada Valley including Indira Sagar Project, knocked at the doors of this Court in W.P. No. 3022/2005 which was disposed of finally on 08.9.2006 wherein this Court issued various directions. In paragraph 110 (x) this Court observed as under: <i>The pondage of the dam should be raised upto 260 meters in present. Be it clarified, we do not say in regard to the height of the dam or the capacity of the reservoir. The capacity of the reservoir is 262.13 meters, but in present we permit this much as certain rehabilitation packages are yet to be carried out. The same shall be carried out by the respondents No. 1 and 2 in quite promptitude with utmost objectivity in consultation with Grievance Redressal Authority and suggestions given by the Central Water Commission. We may further add the Central Water Commission, Grievance Redressal Authority and the respondents No. 1 &amp; 2 should evaluate the effect of the pondage on the backwater level and thereafter proceed pari passu with regard to raising of height of the water and rehabilitation programme."</i></p> <p>No where in its order the Hon'ble High Court of Jabalpur has raised any observations on the study carried out by CWC.</p>
<p>B(v)</p> <p>Further, the values of various coefficients and parameters deduced in this study are at variance with the parameters adopted by the CWC in their report of 1984. The study also mentions that these values are yet to be firmed up / notified by the CWC. The CWC in their study of 1984 on Back Water Levels calculation has adopted Coefficient of rugosity 'n' to be 0.028 for river channel, 0.06 for over bank and Eddy loss</p>	<p>During the study carried out in 1984, a uniform flow was considered between Maheshwar Dam and Sardar Sarovar project. The Cross-Sections of the main river at spacing of approximately 3048 m (10000 ft.) were considered for the studies. Tributaries were not included while computing back water levels.</p> <p>Since the water level in the reach towards Sardar Sarovar Dam is getting affected due to backwater effects and is primarily governed by the water level maintained at the dam, the Model was calibrated at Mandleshwar Site of CWC, which is 224 km upstream of SSP. The</p>

	<p>coefficient 'K' as 0.3 for gradually diverging reaches and 0.1 for gradually converging reaches, whereas the NCA report of June 2008 has used 0.024 for rugosity 'n' for river channel and 1.5 times of it (0.036) for over bank. This results in a lower computed value of the submergence level.</p>	<p>calibration was performed by adjusting Manning's roughness coefficients until simulated water level matched reasonably with the observed water level for a particular discharge.</p> <p>In view of above, the parameters used in this study are in order.</p>
B(vi)	<p>The committee is unable to accept the NCA report on the Back Water Levels calculations considering the stipulations of NWDT award mentioned earlier, the choice of the model, the application of modules with limited data and limited calibration, and the use of coefficients and parameters without verification and firming up by CWC. There is also no submergence map prepared depicting the area, thus it cannot be used for the purpose of planning for the environment and for rehabilitation.</p>	<p>The issues raised here are replied suitably in the above paragraphs at appropriate places. Issues related to submergence and inundation planning are not in the scope of CWC and relate to the project authorities.</p> <p>As indicated at S.No. A(ii) Back Water study has been carried out in Central Water Commission and furnished to the Chairman of the sub-committee..</p>

Annexure - XLV/1-10AGENDA FOR 47<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUPRAISING OF THE HEIGHT OF SARDAR SAROVAR DAM BEYOND EL 121.92  
M : PHASE I CONSTRUCTION OF SPILL WAY PIERS TO FULL HEIGHT AND  
BRIDGE AND INSTALLATION OF GATES (TO BE KEPT IN RAISED  
POSITION)

In the 41<sup>st</sup> meeting dated 6.1.05, ESG while according permission to raise the height of Sardar Sarovar dam from EL 110.64 m to EL 121.92 m had pointed out certain gaps in environmental safe guard measures and had directed that compliance report on fulfilling these gaps should be presented before ESG. Compliance reports were submitted from time to time in the subsequent meetings of ESG. Latest compliance report on gaps pointed out by ESG in 41<sup>st</sup> meeting is annexed as Annexure I. The report clearly indicates substantial fulfillment of gaps in accordance with the decision taken by ESG except a few such as CAT to be completed in 5-6 years subject to review after settlement of cost sharing issue. Cost sharing issue is yet to be settled by the RCNCA. Further, it is emphasized that small gaps like relocation of few monuments, preparation and implementation of fishery plan etc. will be completed during construction of piers and bridge i.e. during 30-36 months. Here it needs to be pointed out that GOG had said that construction of spillway piers and bridge, gates etc. will require minimum 30 to 36 months.

The Technical Committee on back water of Sardar Sarovar Project constituted under Chairmanship of Chief Engineer of CWC, in its report had determined a revised afflux level of 134.15 m for construction of piers & over head bridge which is on lower side of earlier estimates. Thus there will not be any additional submergence due to construction of piers and over head bridge, over and above the submergence which was already considered upto the afflux level of 134.32 m at the time of giving permission to raise the dam upto EL 121.92 m in the 41<sup>st</sup> meeting of ESG.

The NCA in its 80<sup>th</sup> meeting had decided that further construction of Sardar Sarovar Project would be carried out in two phases:-

- (i) construction of spillway piers to its full height and bridge and installation of gates (to be kept in raised position), and
- (ii) Lowering down of gates, and impounding water in the reservoir to full reservoir level EL 138.68 m.

The NCA also decided that the issue of next stage of construction would first be considered in Environment Sub-group. It is proposed to consider first the phase I construction i.e. construction of spillway piers to full height and bridge and installation of gates (to be kept in raised position).

In light of the fact that there is going to be no additional submergence due to Phase I construction of spillway piers to full height and bridge and installation of gates to be kept in open position and near fulfillment of gaps in environmental safe guard measures pointed out by ESG in its 41<sup>st</sup> meeting while according permission to raise dam height to 121.92 m, it is requested that the proposal for construction of spillway piers to full height and bridge and installation of gates (to be kept in raised position) may kindly be considered and recommended to NCA.

# ANNEXURE I **COMPLIANCE ON GAPS IN ENVIRONMENTAL SAFEGUARD MEASURES OF SSP POINTED BY ESG IN 41<sup>ST</sup> MEETING HELD ON 6<sup>TH</sup> JANUARY 2005 AT THE TIME OF GIVING PERMISSION TO RAISE SARDAR SAROVAR DAM HEIGHT TO 121.92 M**

The ESG in its 41<sup>st</sup> meeting held on 6<sup>th</sup> January 2005 recommended to NCA to permit raising the height of the dam to the next stage of construction, i.e. up to EL 121.92 m. The extract from minutes of the 41<sup>st</sup> meeting of the ESG is as follows: -

“It was observed by the members of the Sub-Group that there was substantial compliance on most of the areas, but still there are gaps, which are required to be filled up by concrete actions on the ground by the party states and considering that Govt. of Gujarat, Maharashtra and Madhya Pradesh have conveyed their assurance for completion of all the remaining activities by the end of March 2005, Sub-Group gave clearance for raising the dam height from EL-110.64 m and up to EL-121.92 m and at the same time asked the party States to implement all the environmental safeguard measures, as discussed, in the letter and spirit. The Sub-Group recommended to NCA to permit raising the height of dam to the next stage of construction i.e. up to EL-121.92 m from environmental angle.”

Earlier in 41<sup>st</sup> meeting of ESG Following gaps in fulfillment of environmental & FCA conditions had been pointed out in 41<sup>st</sup> ESG meeting. The compliance status for gaps is also shown as follows: -

**GAP:**

## **CATCHMENT AREA TREATMENT**

The Chairman summing up the discussions stated that compliance on qualitative assessment in all the States needed to be expedited and directed that, the assessment of the forest cover for the areas treated should be analyzed with the help of satellite imageries and the report on assessment for both forest and non-forest areas should be placed before the Sub-Group by the party States.



**COMPLIANCE:****CATCHMENT AREA TREATMENT IN DIRECTLY DRAINING WATER SHEDS  
PHASE I****Forest Area:**

Provision of maintenance & casualty replacement was made, as per approved CAT models in forest areas in the project reports of CAT works. As such, maintenance & casualty replacement works have already been carried out as per the project reports. Treated forest areas had been handed over to forest department.

The concerned Conservator of Forests had been instructed for qualitative assessment of CA & CAT areas with focus on current survival percentage and average Crop height and Crop diameter. Forest dept. had been requested to fill the gaps.

Forest Survey of India (FSI) Dehradun, had submitted proposal to study change in forest cover in forest area treated using remote sensing technique. NVDA had approved the study and sanctioned Rs. 4.65 lakhs for the same. MOU had been signed and first installment of Rs. 116250/- had been paid to FSI on 27.02.09. FSI had already started working on assessment of change in forest cover.

**Non Forest Areas:**

Catchment Area Treatment works in non forest area has been completed as per the action plan. There is no provision of maintenance and it is expected that the farmers will carry out the maintenance work. It has been experienced that the farmers use to take out the silt deposited in upstream of the structure from time to time and spread it in their fields for improving the productivity of their fields.

Regarding establishment of Silt Monitoring Station in Directly Draining CAT works NVDA has already taken action for establishment of SMS in Barwani District in sub watershed NdId (high priority), village Ghugshi with the help of the Central Soil and Water Conservation Institute and Training Centre Datia, M.P. The same is being constructed at a cost of Rs. 854368.

**CATCHMENT AREA TREATMENT IN FREELY DRAINING WATER SHEDS****PHASE II**

In 44<sup>th</sup> meeting it has been instructed that the very high and high priority area in freely drained areas of SSP is to be treated at project cost. Under Phase-II programme the total area required to be treated is 3, 18,118 ha. 13693 ha forest area & 36615 ha non forest area, i.e. total of 50308 ha had been treated up to March 2009. Thus a balance of 267810 Ha is still left to be treated. In this connection, it is to be mentioned that group of

Secretaries of GOI had decided in 08.07.1992 that major irrigation projects are not to be loaded with CAT expenditure on freely draining areas. Hence, it is desired that Ministry of Agriculture, Govt. of India should provide necessary funds under Macro Management programme to treat freely draining areas of SSP on priority. It is estimated that approximately Rs. 300 Crores at present cost norms will be required to treat freely drained areas and GOI Ministry of Agriculture should provide sufficient funds to GoMP. GoMP (NVDA) will provide necessary matching contribution in form of establishment expenditure. It is further requested that GoI should provide money as full grant without any loan component and make NVDA as separate nodal agency for carrying out CAT works in Narmada Valley along with Agriculture depts. of state government to facilitate timely & effective implementation of CAT works in Narmada valley. However, if it is not possible to provide sufficient funds under Macro Management programme, it is requested that CAT expenditure is to be loaded on all the three units (i.e. Unit I, Unit II & Unit III) of Sardar Sarovar Pariyojna which requires expenditure on CAT works to be divided in ratio of 77: 14:6:3 amongst participating states viz. GoG: GoMP: GoMAH: GoRAJ respectively. Further it needs to be mentioned that it may not be possible to carry out CAT in freely drained areas commensurate with progressive filling of the reservoir due to magnitude of task involved.

In 45<sup>th</sup> meeting of ESG it has been decided that catchment area treatment may be completed in 5-6 years time and this time frame is to be reviewed after cost sharing issue is decided. NVDA had made plans to complete the same in 6 years time by following Rajiv Gandhi Mission procedure and involving NGO to carry out the same. NGO had been identified, short listed and sub water sheds had been allotted to them for the same.

#### **GAP:**

#### **COMPENSATORY AFFORESTATION**

The Chairman directed that the areas where survival rate is poor should be supplemented with casualty replacements and a report on composition, survival count etc should be presented before the Sub-Group along with the information on the areas which were already transferred. He suggested that a report, on the

plantations carried out during 1989-90 must have been established by now and should be presented to the Sub-Group.

**COMPLIANCE:**

Planted areas had been handed over to forest dept. with average survival percentage of 41% for future management.

The concerned Conservator of Forests had been instructed for qualitative assessment of CA & CAT areas with focus on current survival percentage and average Crop height and Crop diameter. Forest dept. had been requested to fill the gaps.

Forest Survey of India (FSI) Dehradun, had submitted proposal to study change in forest cover in area planted using remote sensing technique. NVDA had approved the study and sanctioned Rs. 4.65 lakhs for the same. MOU had been signed and first installment of Rs. 116250/- had been paid to FSI on 27.02.09. FSI had already started working on assessment of change in forest cover.

**GAP: FLORA, FAUNA AND CARRYING CAPACITY**

EIA report on proposed sanctuaries is to be submitted.

**COMPLIANCE:**

Draft final report on EIA studies entitled "Evaluation of ecological and socioeconomic consequences of setting up of proposed Mathwad and Kathiwada Wildlife sanctuary, M.P." was submitted by Wildlife Institute of India. WII had recommended establishment of Kathiwada sanctuary and had stated that it is not suitable to establish Mathwad WLS. Wild life committee had proposed expenditure of Rs. 13.97 crores at 2002 price level for establishment and development of Kathiwada sanctuary. NVDA had agreed to meet the said expenditure on notification of said sanctuary by Forest Dept. Forest department is taking necessary action in the matter.

**GAP:**

**Implementation report on recommendations of the studies by SFRI Jabalpur on social forestry plan**

**COMPLIANCE:**

As per recommendation of SFRI Jabalpur a social forestry plan had been taken up to enhance fuel & fodder availability in SSP rehabilitation area. NVDA has entrusted the task to the State Forest Department and had released an amount of Rs.4.41 Crores to forest dept. To meet increased requirement of forest produce under social forestry programme 1,597,430 trees had been planted in community and waste land & in fields of farmers in Kharagone, Badwani, Dhar & Jhabua districts.

**GAP:**

Fellings of trees to be completed before submergence.

**COMPLIANCE:**

Felling of trees has been carried out by the State Forest Department up to FRL. A total of 43973 trees had been marked and felled in forest area. In non forest areas 18670 trees had been felled out of total of 19057 trees identified, 387 trees could not be felled due to agitation by local people. Similarly 6057 trees out of total of 8837 marked trees in private fields were felled and 2193 trees could not be felled due to local agitation. NVDA had written to Collector Dhar to provide police force to forest dept. so that balance trees in non forest area could be felled. Collector Dhar had instructed SP Dhar accordingly. It is, however, law and order problem and all efforts are being made to fell balance trees.

According to forest department there is no coppice growth in the felled trees in the submerged area & its felling is not required to be carried out.

**GAP:**

**Fishery conservation aspect. Revised plan assured**

**COMPLIANCE:****Conservation and Development of Fisheries in SSP Reservoir****1. Updation of Plan - Formation of Sardar Sarovar Interstate Fisheries Development and Conservation. :**

On the advice of Environment Sub-group, NCA during its 52<sup>nd</sup> meeting constituted High Level Expert Group on Development & Conservation of Fisheries in Sardar Sarovar Reservoir under the Chairmanship of Joint Secretary (Fisheries), Ministry of Agriculture & Cooperation, GOI. Director ( Environment) , NCA is Member Secretary. Till date 11<sup>th</sup> Meetings of HLEG have been held.

The HLEG have formulated and issued Guidelines for conservation and Development of Fisheries in Large, Medium and Small reservoirs for adoption by the States. The copies of the Large and Medium and Small Reservoirs have been circulated to the Secretary ( Fisheries ) of all the State Governments The guidelines are quite comprehensive as well as informative.

The individual plans on development of SSP reservoir/prepared and submitted by the participating States viz. GOG, GOM and GOMP have incorporated most of issues incorporated in the guidelines.

In the HLEG meeting directive were also issued to the state Govt. of Gujrat, Maharastra and M.P. to update their plans on Fisheries Conservation and Development of Sardar Sarovar with respect to setting up a joint stock company for management of the

aforesaid reservoir, Eco-ethological issues in conservation of fisheries in the reservoir and command area, stocking of reservoir & aquatic ecosystem of Sardar Sarovar Reservoir.

In order to resolve the difference between the party states, on the advice of HLEG, GOG entrusted preparation of a concept paper to IIM, Ahmedabad and a draft blue print has accordingly been obtained and circulated among of the party states. In fact it is a proposal to carry out fishing in the reservoir through joint efforts constituting a 3-tier body consisting of steering Committee, Executive Committee and a Professional Body, N.V.D.A. has however clarified its stand to abide by the NWDT award confining the fishery development activities within the Territorial jurisdictions of submergence of the participating states, as provided in the clause XI, sub-clause V(s) of the NWDT award. The Member (Civil/E&R) NCA, Indore as well as The Secretary (WR) and Chairman, NCA, Ministry of Water Resources, New Delhi have also been informed accordingly vide N.V.D.A. Letter No. 125/Matsya/E&F Bhopal dated 25<sup>th</sup> March, 2009.

## **2. Aquatic Environment :-**

The pre and post impoundment action plan for SSP as Suggested by CIFRI to safeguard the Aquatic Environment is being incorporated. This includes items --

- (i) Hydrological monitoring with reference is thermal stratification and (ii) Monitoring of Organic Loading are being incorporated in SSP and ISP, while studies on other parameters are being continued.

## **3. Safeguard of Endangered Species :**

CIFRI in their desk review have identified 8 endangered species – Viz. Tor tor, Tor putitora and Tor Khudree, Rita Pavimentata, Labeo fimbriatus, Notopteres chitala, Tenuulosa ilishia and Macrobrachium rosenbargii.

Out of the aforesaid species Tenuulosa ilishia and Macrobrachium rosenbargii do not migrate up to the reservoir as earlier studies conducted by CIFRI, Barrackpore ( Biological Investigations on Fish and Fisheries of Narmada River ( 1958-1966) reveal that they breed in the river stretch upto Indravarna about 10 KM.

up-stream of Mangrol while ascending. These observations are of significant importance in view of the construction of Sardar Sarovar Dam across river Narmada near Navagam (Gujarat State) about 5 km upstream of Indravarna. Of the remaining 6 Spp., only one spp. of Mahaseer *Tor tor* are abundantly found in Narmada river, the breeding technology of which is now well established. It is proposed to set up a Mahaseer Hatchery for breeding of *Tor tor* and the site selection is under process.

The breeding technology of *Labeo fimbriatus* is similar to the Major carps and thus will not present any difficulty. CIFA, Bhubaneswar has been approached for the breeding technology of *Rita Pavimantata* and *Notopterus chitala*. The presence of *Notopterus chitala* in R.Narmada is however doubtful.

#### **4. Other Activities in Sardar Sarovar :**

(i) **Stocking :** Stocking has been initiated and during 2007-08, 4.00 Lacks

Fingerlings of Indian Major carps have been stocked.

(ii) **Training of Oustees (PAFs) :** 423 oustees have so far been imparted

training in fishing and other allied activities. The process is under progress.

#### **GAP: HEALTH ASPECTS**

The Director (Environment), NCA informed that the progress on implementation of the environment safeguard measures was received only a few days back and is under scrutiny. Preliminary observations however reveal that the progress reports sent is not in response to the action plan submitted instead appears to be cover only the general activities of the health department.

Health plan to be implemented.

#### **COMPLIANCE:**

The health plan had been implemented.

NVDA has signed a MoU with the State Health Department to implement the Health Action Plan. As reinforcement to the existing Health delivery system, NVDA has built total 60 buildings at R/R sites and transferred 47 buildings out of them to the State Health Department to be made functional as Health Centers. Existing SHCs in peripheral areas are being strengthened by providing them furniture, first aid boxes, emergency kits, stipend to health workers, surveillance workers, microscopes etc. In addition to this

mobile dispensary vans are also operating in villages. A Health Cell with full computerized information system has been established at NVDA's head office. The function of this Cell is to collect the information/data of diseases (disease surveillance), analyze the data and suggest remedial measures. Besides this, Malaria Research Centre, Delhi is also carrying out regular field survey. This will help to ensure progressive control of diseases. Checking of water samples at R&R sites is being regularly carried out by the Public Health Engineering Cell of NVDA. The control of malaria and other water borne diseases is being carried out as per national directives under the guidance of State Health Department. Local societies at the R&R sites are being motivated to construct sanitary latrines. Sewerages systems have been provided in urban R & R sites for Dharampuri. IEC activities have been carried out in the plan area in form of camps, training and health education. The health aspect of project affected people is being looked after under various schemes by State Health Department.

#### GAP:

**Archaeology: Relocation/ protection of monuments is to be reported:**

#### COMPLIANCE:

Activity	Present Status
Monuments	<p>There are no monuments/mounds of national-importance in SSP submergence at FRL. There are 23 monuments at FRL. Three monuments are above revised water level which leaves 20 monuments to be shifted. The work of shifting of 11 Monuments had been completed. Details of balance 9 monuments is as follows :-</p> <ul style="list-style-type: none"> <li>(i) Shifting of one monument is completed and construction of temple is in progress.</li> <li>(ii) Part shifting of one monument is completed and rest is in progress.</li> <li>(iii) One monument will be protected by construction of protection wall.</li> <li>(iv) Replica of one monument will be made at rehabilitation site.</li> <li>(v) Work at balance seven monuments is in progress but translocation is affected due to agitation by local people and the issue is related with shifting of people.</li> </ul> <p><b>However, translocation of all monuments will be completed before construction of piers, over head bridge etc. i.e. within 30 - 36 months.</b></p>
Mounds	Excavation of all 13 Mounds at FRL in SSP have been completed.
Museums	State Archeological dept. had to maintain the museums and minimum sculpture are required so museum can be maintained. Due to insufficient sculptures it has been

## Archaeology: Relocation:

## COMPLIANCE:

Activity	Present Status
Monuments	<p>There are no monuments/mounds of national importance in SSP submergence at FRL. There are 23 monuments at FRL. Three monuments are above revised water level which leaves 20 monuments to be shifted. The work of shifting of 11 Monuments had been completed. Details of balance 9 monuments is as follows :-</p> <ul style="list-style-type: none"> <li>(i) Shifting of one monument is completed and construction of temple is in progress.</li> <li>(ii) Part shifting of one monument is completed and rest is in progress.</li> <li>(iii) One monument will be protected by construction of protection wall.</li> <li>(iv) Replica of one monument will be made at rehabilitation site.</li> <li>(v) Work at balance seven monuments is in progress but translocation is affected due to agitation by local people and the issue is related with shifting of people.</li> </ul> <p>However, translocation of all monuments will be completed before construction of piers, over head bridge etc. i.e. within 30 - 36 months.</p>
Mounds	Excavation of all 13 Mounds at FRL in SSP have been completed.
Museums	State Archeological dept. had to maintain the museums and minimum sculpture are required so museum can be maintained. Due to insufficient sculptures it has been decided to construct only one museum at Kasrawad and create a gallery in State Museum at Bhopal. Thus construction of one museum had been completed and gallery had been established in State Museum at Bhopal.



Annexure - XLVII-11AGENDA FOR 47<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUPRAISING OF THE HEIGHT OF SARDAR SAROVAR DAM BEYOND EL 121.92 M:  
PHASE II - LOWERING DOWN OF GATES AND IMPOUNDING WATER IN  
THE RESERVOIR TO FULL RESERVOIR LEVEL EL 138.68 M.

The NCA in its 80<sup>th</sup> meeting had decided that further construction of Sardar Sarovar Project would be carried out in two phases:-

- (i) construction of spillway piers to its full height and bridge and installation of gates (to be kept in raised position), and
- (ii) Lowering down of gates, and impounding water in the reservoir to full reservoir level EL 138.68 m.

The NCA also decided that the issue of next stage of construction would first be considered in Environment Sub-group and R&R Sub-group.

GOMP (NVDA) has separately proposed an agenda before ESG for Phase I construction of spillway piers to full height and bridge and installation of gates (to be kept in raised position).

In the present agenda it is now proposed that ESG may kindly accord permission to Phase II construction also i.e. lowering down of gates and impounding water in the reservoir to full reservoir level EL 138.68 m as most of the conditions of diversion of forest land up to full height of dam have been fulfilled. Compliance status of fulfillment of FCA conditions is given in Annexure I and status of environmental safeguard measures is given in Annexure II. It is apparent that except catchment area treatment in freely draining catchment, establishment of Kathiwada sanctuary and translocation of few monuments of local importance all environmental safeguard measures have been completed.

Govt. of Gujarat had said that it will require at least 30 to 36 months to complete the construction of spillway piers to its full height and bridge and installation of gates.

ESG in its 45<sup>th</sup> meeting had given 5-6 years time subject to revision of time frame after settlement of cost sharing issue for catchment area treatment. NVDA had prepared a strategy to complete the catchment area treatment in 5-6 years time by involving NGOs for carrying out CAT in non-forest area following procedure of Rajiv Gandhi Mission. NVDA has already identified NGOs for carrying out CAT and allotted sub water sheds and is in the process of identifying resources to do the same. Similarly NVDA is also forming strategy to involve Joint Forest Committees to carry out CAT in forest areas. Thus, NVDA will be able to complete the CAT in 5-6 years time as per instructions of ESG.

Establishment of Kathiwada sanctuary is in active consideration of GOMP and NVDA has already sanctioned Rs. 13.97 crores for the same. Further, process of establishment of Kathiwada sanctuary will be completed in 30-36 months, well before construction of spillway piers to full height and bridge and installation of gates. Here it may be mentioned that Kathiwada sanctuary is located at a distance of more than 30 kms from Sardar Sarovar reservoir, its establishment will have negligible effect on wild life affected by reservoir.

Regarding shifting/translocation of monuments up to FRL it is submitted that shifting will be completed before construction of spillway piers to its full height and bridge and installation of gates. Further, none of the monuments required to be shifted are of national importance.

From Annexures I & II enclosed, it is clear that substantial compliance of all the conditions of clearances has been carried out by GOMP except the works mentioned above. It is proposed that the ESG may consider clearing the proposal of Phase II construction of Sardar Sarovar Project also i.e. closing of gates for impounding water upto FRL 138.68 m.

# ANNEXURE I

## COMPLIANCE STATUS OF FCA CONDITIONS IMPOSED BY GoI MoEF FOR SSP AT FRL LEVEL

**MoEF FCA sanction Letter No. 3-87/80-IA Dated the 8<sup>th</sup> Sept. 1987 &  
No.8-372/83-FC dated 06.01.1989**

Description of condition	Compliance Status
1) Legal status of the land will remain unchanged.	There had been no change in legal status of land.
2) The full details of the non-forest lands for raising compensatory afforestation with complete details viz. Khasra No., village etc. will be reported by the State Government before 30.9.87.	Full details had been provided and CA plan had been approved by GoI MoEF vide letter No. F.No. 1/84-FRY (CONS) dated 23.7.1990
3) As inserted by MoEF letter No.8-372/83-FC dated 06.01.1989 as follows:- (ii)(a) The non-forest area selected shall be surveyed, demarcated and declared as reserved/protected forests and placed under the control of State Forest Department for raising compensatory afforestation at the cost of the project. Area not found suitable shall be substituted by suitable areas".	6538 forest area, 2199.425 ha non forest area, total of 8737.425 ha had been planted and handed over to Forest Department and is under control of Forest Department. 1,832.979 ha had been notified as PF. Balance area is under various stages of notification. The balance area will be notified before construction of spillway piers to its full height and bridge & installation of gates
(iii) The non-forest areas available for rehabilitation of all the oustees will be reported to the State Governments or a proposal to the satisfaction of Govt. of India in this regard will be furnished by the State Government before 30.11.87.	The details had been provided.
4) No work on the project in forest area will be commenced until and unless condition under (ii) and (iii) above are fulfilled.	Complied.
5) Since the project involves violation and also loss of the non-forest areas for compensatory afforestation are away from the project areas, the State Govts. will raise compensatory afforestation double the degraded forest lands also in the project impact areas in addition to the afforestation on equivalent non-forest land. A scheme for this will be submitted by 30.11.87.	CA plan had been approved by GoI MoEF vide letter No. F.No. 1/84-FRY (CONS) dated 23.7.1990 and implemented with minor deviations. Total Area to be planted as per plan : 8737.034 ha Total Area planted under CA : 8737.425 ha Non forest Area Planted : 2199.425 ha Forest Area Planted : 6538.000 ha
6) The State Governments will prepare by 30.11.87 a plan for the treatment of catchment areas failing which the Central Government will appoint a team for this purpose at the cost of the project for this purpose.	Catchment area treatment plan had been prepared and submitted to MoEF vide letter No. NVDA/AGRICULTURE/ 90-91/472/920 dated 22.06.91 and NVDA/E&F/TECH/93-94/472/1941 dated 12.11.93 The progress is as follows :-

amended by MoEF letter No.8-372/83-FC dated 06.01.1989 as follows:-

"A plan for the treatment of the catchment area will be prepared by 31.3.1989 and implemented at the cost of the project".

#### PHASE I: (Directly Draining) Area in Hectares

DETAILS	TARGET	ACHIEVEMENT
FOREST	49225	44600*
NON FOREST	66397	66397**
TOTAL	115622	110997

#### Forest Area:

\* Includes 3352 ha area treated by forest deptt.

- 4625 Ha forest area is unworkable due to rocky, very hilly etc.

#### Non Forest:

\*\* Include 889 ha. treated by other agencies.

#### PHASE II: (Freely Draining) Area in Ha.

DETAILS	TARGET	ACHIEVEMENT	BALANCE
FOREST	78368	13693	64675
NON FOREST	239750	36615	203135
TOTAL	318118	50308	267810

Treatment of balance area will require approximately Rs. 300 crores. Govt. of M.P. is unable to treat the balance area from its resources due to large requirement of funds. ESG had suggested a time frame of 5 to 6 years for completing the treatment of balance area. Govt. of M.P. can complete the task if funds are provided under macro management scheme of Govt. of India or any other scheme. NVDA had prepared a strategy to complete the catchment area treatment in 5-6 years time by involving NGO in carrying out CAT in non forest area following procedure of Rajiv Gandhi Mission. NVDA had already identified NGO for carrying out CAT and allotted sub water sheds and is in the process of identifying resources to do the same. Similarly NVDA had also forming strategy to involve Joint Forest Committees to carry out CAT in forest areas. Thus, NVDA will be able to complete the CAT in 5-6 years time as per instructions of ESG.

Further issue of cost sharing of CAT had not yet been resolved. It needs to be mentioned that during 45<sup>th</sup> meeting of ESG it has been instructed to complete the CAT in 5-6 years time and to review the time frame of treating the balance area after issue of cost sharing of CAT is decided.

ii) No forest land will be utilized for the habilitation of oustees.

No forest land had been utilized for the rehabilitation of oustees.

iii) Tree felling will be permitted in submergence area only up to 4 m below FRL.

Tree felling had been completed barring 2580 trees in revenue areas due to agitation of local people.

<p>b) Tree planting will be done on either side of the canals, roads, forest area of the reservoir and the waste land/vacant lands under the control of the Irrigation Department.</p>	<p>No coppice growth exists in submergence area. Will be carried out after filling of reservoir up to FRL by utilizing reservoir water for plantation.</p>
<p>c) Water will be supplied free of cost to the Forest Department for raising nursery and for irrigating forestry plantations in the command area.</p>	<p>Complied.</p>
<p>d) In order that the construction labour and staff while working on the project in the forest area may not cause destruction to the forest area for meeting their fuelwood needs, the user agency will establish fuelwood depots and will provide suitable alternative domestic fuel such as fuelwood, coal, kerosene oil etc to them free of cost or at cost deducted from their salary and wages.</p>	<p>Complied.</p>
<p>erted by MoEF letter No.8-372/83-FC dated 6.01.1989 as follows:- a) For conservation and management of wildlife, a Committee will be constituted by the State Govt. by 31<sup>st</sup> January, 1989 which will include a representative from the Government of India. The Committee will suggest the necessary steps to be taken and draw up a plan which will be implemented at the cost of the project".</p>	<p>Govt of M.P. had constituted wild life committee vide order no.F-5/59/83/10/3 dated 29.05.90 . Wild life committee had proposed establishment of two sanctuaries i.e. Mathwad &amp; Kathiwada and recommended expenditure of Rs. 21.76 crores &amp; 13.97 crores respectively. Subsequently Wild Life Institute of India, Dehradun (WII) had been entrusted to carry out EIA study in the area. WII had submitted its report in February 2008 and recommended establishment of Kathiwada wild life sanctuary in Jhabua district. Report of WII had been accepted by GoMP in principle and GoMP is in the process of declaring Kathiwada sanctuary and examining the proposal from various angles. In the mean time NVDA had approved expenditure of Rs. 13.94 crores at 2002 price level on 17.06.08.</p> <p>M.P. Forest department while examining the report of WII had found that establishment of Kathiwada sanctuary will require relocation of 6 villages and will involve expenditure of Rs. 50.7 crores. Thus establishment of Kathiwada sanctuary will involve total expenditure of Rs.64.67 crores.</p> <p>Further process of establishment of Kathiwada sanctuary will be completed in 30-36 months well before</p>

construction of spillway piers to its full height and bridge  
& installation of gates.

ANNEXURE II

# COMPLIANCE STATUS OF ENVIRONMENTAL CONDITIONS IMPOSED BY GOI MoEF FOR SSP AT FRL LEVEL

MoEF sanction letter No. 3-87/80-IA dated June 24, 1987

Description of condition	Compliance Status
<p>On the basis of examination of details on these projects by the Environmental Appraisal Committee for River Valley Projects and discussions with the Central and State authorities the following details were brought from the Project authorities :-</p> <ul style="list-style-type: none"> <li>Rehabilitation Master Plan</li> <li>Phased Catchment Area Treatment Scheme.</li> <li>Compensatory Afforestation Plan.</li> <li>Command Area Development.</li> <li>Survey of Flora and Fauna.</li> <li>Carrying capacity of surrounding area.</li> <li>Seismicity; and</li> <li>Health Aspects.</li> </ul>	<p>Rehabilitation plan had been prepared. Phased catchment area treatment plan is prepared and is being implemented. The details are given in compliance of FCA conditions in Annexure I. CAF plan is submitted and approved by GoI, MoEF and had been completed. Survey of fauna and flora and assessment of carrying capacity of surrounding areas had been carried by SFRI Jabalpur and WII Dehradun. The recommendations had been implemented. Health plan for SSP had been prepared and submitted to ESG &amp; is implemented. Command area lies in Gujarat and seismicity is being reported by Govt. of Gujarat.</p>
<p>Field Surveys are yet to be completed. The first set of information has been made available and complete details have been assured to be furnished by 1989.</p>	<p>Complied.</p>
<p>The NCA has been expanded and its terms of reference have been amplified to ensure that environmental safeguard measures are planned and implemented in depth and in its pace of implementation pari-passu with the progress of work on the project.</p>	<p>No comments.</p>
<p>After taking into account all relevant facts the Narmada Sagar Project, Madhya Pradesh and the Sardar Sarovar Project, Gujarat are hereby accorded environmental clearance subject to the following conditions.</p>	<p>No comments.</p>
<p>(i) The Narmada Control Authority (NCA) will ensure that environmental safeguard measures are planned and implemented pari-passu with progress of work on projects.</p>	<p>NCA and ESG of NCA is monitoring progress of environmental safeguard measures periodically</p>
<p>(ii) The detailed surveys/studies assured will be carried out as per the schedule proposed and details made available to the Department for assessment.</p>	<p>As per recommendation of SFRI Jabalpur Govt. of M.P. had undertaken following safeguard measures. :</p> <ol style="list-style-type: none"> <li>1. To cater to meet increase requirement of forest produce under social forestry programme 901040 trees had been planted in community land, waste land &amp; in fields of farmers at a cost of 5.6 crores in Khargone, Badwani,</li> </ol>

5 (iii) The Catchment Area Treatment Programme and the Rehabilitation Plans be so drawn as to be completed ahead of reservoir filling.

Dhar & Jhabua districts. The programme had been completed in 2007-08. To increase requirement of forest produce under social forestry programme 1,597,430 trees had been planted in community and wasteland & in fields of farmers in Khargone, Badwani, Dhar & Jhabua districts. 2.60 islands are proposed to be left undisturbed.

Catchment area treatment plan had been prepared and submitted to MoEF vide letter No. NVDA/AGRICULTURE/ 90-91/472/920 dated 22.06.91 and NVDA/E&F/TECH/93-94/472/1941 dated 12.11.93. The progress is as follows :-

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	Similarly NVDA had also forming strategy to involve Joint Forest Committees to carry out CAT in forest areas. Thus, NVDA will be able to complete the CAT in 5-6 years time as per instructions of ESG. . Further issue of cost sharing of CAT had not yet been resolved. It need to be mentioned that during 45 <sup>th</sup> meeting of ESG it has been instructed to complete the CAT in 5-6 years time and to review the time frame of treating the balance area after issue of cost sharing of CAT is decided..
(iv) The Department should be kept informed of progress on various works periodically.	NCA/ESG is being informed of progress of various works in its periodic meetings.
Approval under Forest (Conservation) Act, 1980 for conversion of forest land will be obtained separately. No work should be initiated on forest area prior to this approval.	Complied.
Approval from environmental and forestry angles for any other irrigation, power or development projects in the Narmada Basin should be obtained separately.	Complied.

#### DETAILS OF OTHER ENVIRONMENTAL SAFE GUARD MEASURES

##### **Implementation report on recommendations of the studies by SFRI Jabalpur on social forestry plan**

As per recommendation of SFRI Jabalpur a social forestry plan had been taken up to enhance fuel & fodder availability in SSP rehabilitation area. NVDA has entrusted the task to the State Forest Department and had released an amount of Rs.4.41 Crores to forest dept. To meet increase requirement of forest produce under social forestry programme 1,597,430 trees had been planted in community and waste land & in fields of farmers in Khargone, Badwani, Dhar & Jhabua districts.

##### **Fellings of trees:**

Felling of trees has been carried out by the State Forest Department up to FRL. A total of 43973 trees had been marked and felled in forest area. In non forest areas 18670 trees had been felled out of total of 19057 trees identified, 387 trees could not be felled due to agitation by local people. Similarly 6057 trees out of total of 8837 marked trees in private fields were felled and 2193 trees could not be felled due to local agitation. NVDA had written to Collector Dhar to provide police force to forest dept. so that balance trees in non forest area could be felled. Collector Dhar had instructed SP Dhar accordingly. It is, however, law and order problem and all efforts are being made to fell balance trees.

According to forest department there is no coppice growth in the felled trees in the submerged area & its felling is not required to be carried out.

### **Conservation and Development of Fisheries in SSP Reservoir:**

#### **1. Updation of Plan - Formation of Sardar Sarovar Interstate Fisheries Development and Conservation. :**

On the advice of Environment Sub-group, NCA during its 52<sup>nd</sup> meeting constituted High Level Expert Group on Development & Conservation of Fisheries in Sardar Sarovar Reservoir under the Chairmanship of Joint Secretary (Fisheries), Ministry of Agriculture & Cooperation, GOI. Director (Environment), NCA is Member Secretary. Till date 11<sup>th</sup> Meetings of HLEG have been held.

The HLEG have formulated and issued Guidelines for conservation and Development of Fisheries in Large, Medium and Small reservoirs for adoption by the States. The copies of the Large and Medium and Small Reservoirs have been circulated to the Secretary ( Fisheries ) of all the State Governments. The guidelines are quite comprehensive as well as informative.

The individual plans on development of SSP reservoir/prepared and submitted by the participating States viz. GOG, GOM and GOMP have incorporated most of issues incorporated in the guidelines.

In the HLEG meeting directive were also issued to the state Govt. of Gujrat, Maharastra and M.P. to update their plans on Fisheries Conservation and Development of Sardar Sarovar with respect to setting up a joint stock company for management of the aforesaid reservoir, Eco-ethological issues in conservation of fisheries in the reservoir and command area, stocking of reservoir & aquatic ecosystem of Sardar Sarovar Reservoir.

In order to resolve the difference between the party states, on the advice of HLEG, GOG entrusted preparation of a concept paper to IIM, Ahmedabad and a draft blue print has accordingly been obtained and circulated among of the party states. In fact it is a proposal to carry out fishing in the reservoir through joint efforts constituting a 3-tier body consisting of steering Committee, Executive Committee and a Professional Body. N.V.D.A. has however clarified its stand to abide by the NWDT award confining

the fishery development activities within the Territorial jurisdictions of submergence of the participating states, as provided in the clause XI, sub-clause V(s) of the NWDT award. The Member (Civil/E&R) NCA, Indore as well as The Secretary (WR) and Chairman, NCA, Ministry of Water Resources, New Delhi have also been informed accordingly vide N.V.D.A. Letter No. 125/Matsya/E&F Bhopal dated 25<sup>th</sup> March, 2009.

## 2. Aquatic Environment :-

The pre and post impoundment action plan for SSP as Suggested by CIFRI to safeguard the Aquatic Environment is being incorporated. This includes items

- (i) Hydrological monitoring with reference is thermal stratification and (ii) Monitoring of Organic Loading are being incorporated in SSP and ISP, while studies on other parameters are being continued.

## 3. Safeguard of Endangered Species :

CIFRI in their desk review have identified 8 endangered species – Viz. Tor tor, Tor putitora and Tor Khudree, Rita Pavimentata, Labeo fimbriatus, Notopteres chitala, Tenuulosa ilishia and Macrobrachium rosenbargii.

Out of the aforesaid species Tenuulosa ilishia and Macrobrachium rosenbargii do not migrate up to the reservoir as earlier studies conducted by CIFRI, Barrackpore ( Biological Investigations on Fish and Fisheries of Narmada River ( 1958-1966) reveal that they breed in the river stretch upto Indravarna about 10 KM. up-stream of Mangrol while ascending. These observations are of significant importance in view of the construction of Sardar Sarovar Dam across river Narmada near Navagam (Gujarat State) about 5 km upstream of Indravarna. Of the remaining 6 Spp., only one spp. of Mahaseer Tor tor are abundantly found in Narmada river, the breeding technology of which is now well established. It is proposed to set up a Mahaseer Hatchary for breeding of Tor tor and the site selection in under process. The breeding technology of Labeo fimbriatus is similar to the Major carps and thus will not present any difficulty. CIFA, Bhubaneswar has been approached for the

breeding technology of *Rita Pavimantata* and *Notopterus chitala*. The presence of *Notopterus chitala* in R.Narmada is however doubtful.

#### 4. Other Activities in Sardar Sarovar :

(i) **Stocking :** Stocking has been initiated and during 2007-08, 4.00 Lacks

Fingerlings of Indian Major carps have been stocked.

(ii) **Training of Oustees (PAFs) :** 423 oustees have so far been imparted training in fishing and other allied activities. The process is under progress.

### HEALTH ASPECTS

The health plan had been implemented.

NVDA has signed a MoU with the State Health Department to implement the Health Action Plan. As reinforcement to the existing Health delivery system, NVDA has built total 60 buildings at R/R sites and transferred 47 buildings out of them to the State Health Department to be made functional as Health Centers. Existing SHCs in peripheral areas are being strengthened by providing them furniture, first aid boxes, emergency kits, stipend to health workers, surveillance workers, microscopes etc. In addition to this mobile dispensary vans are also operating in villages. A Health Cell with full computerized information system has been established at NVDA's head office. The function of this Cell is to collect the information/data of diseases (disease surveillance), analyze the data and suggest remedial measures. Besides this, Malaria Research Centre, Delhi is also carrying out regular field survey. This will help to ensure progressive control of diseases. Checking of water samples at R&R sites is being regularly carried out by the Public Health Engineering Cell of NVDA. The control of malaria and other water borne diseases is being carried out as per national directives under the guidance of State Health Department. Local societies at the R&R sites are being motivated to construct sanitary latrines. Sewerages systems have been provided in urban R & R sites for Dharampuri. IEC activities have been carried out in the plan area in form of camps, training and health education. The health aspect of project affected people is being looked after under various schemes by State Health Department.

Amme Xwe-XLVII-12

IN THE HIGH COURT OF MADHYA PRADESH PRINCIPAL SEAT AT JABALPUR

WRIT PETITION No. 6056 /2009 (PIL)

DIRECTOR OF JUDICIAL OFFICE  
Dy. No. 325  
Date 17-11-09

In the matter of:

Narmada Bachao Andolan, through

1. Medha Patkar, D/o Vasant Khanolkar, Aged 54 years, R/o 62 M.G. Marg, Badwani (M.P.)
2. Rami Singh S/o Gendya Jalala, Aged about 50 years, Village Mandil, Tehsil Rajpur, District Badwani
3. Ramesh Yadav, S/o, Omkar Yadav, Aged 54 years, R/o Village Piplud, Tehsil and District Badwani
4. Bhagvan Pirag, S/o Dharnaji, Aged about 55 years, R/o Village Langur, Tehsil Manavar, District Dhar
5. Ramaji, S/o Bheekaji, Aged about 52 years, R/o Village Koswada, Tehsil Manavar, District Dhar
6. Chagan, S/o Dashariya, Aged about 40 years, R/o Village Limbi, Tehsil Manavar, District Dhar
7. Jamsingh, S/o Richa, Aged about 60 years, R/o Village Limbi, Tehsil Manavar, District Dhar

Presented on 19/06/09

By J. Kumar

Presented by Registrar

.....PETITIONERS

VERSUS

- 1) State of Madhya Pradesh, Through its Chief Secretary, Vallabh Bhavan, Bhopal (M.P.)
- 2) Narmada Valley Development Authority,  
Through its Chairman, Narmada Bhavan,  
Jail Road, Bhopal (M.P.)
- 3) Ministry of Environment and Forests  
Through its Secretary, Paryavaran Bhavan,  
CGO Complex, Lodhi Road, New Delhi
- 4) Narmada Control Authority,  
Through its Secretary, Ministry of Water  
Resources & Chairman, Narmada Control  
Authority, Shram Shakti Bhavan, Rafi Marg,  
New Delhi 110 001
- 5) District Collector,  
Collector Office, Silavard Road, Badwani
- 6) District Collector, Collector Office, Dhar

.....RESPONDENTS

REGULAR PUBLIC INTEREST LITIGATION PETITION

HIGH COURT OF JUDICATURE MADHYA PRADESH  
JABALPUR M.P.

W.P. NO.6056 OF 2009

Narmada Bachao Andolan  
Vs.  
State of M.P. and others.

Present: Hon'ble Mr. Justice A.K. Patnaik, Chief Justice.  
Hon'ble Mr. Justice Ajit Singh, Judge.

Ms. Medha Patkar for the petitioners.  
Mr. Ravish Agrawal, Senior Advocate with Mr. Naman  
Nagrath, Additional Advocate General and Mr. Arpan J.  
Pawar, Advocate for the respondents No.1, 2, 5 and 6.  
Mr. Radhelal Gupta, Assistant Solicitor General for the  
respondent No.3.  
Mr. Dharmendra Sharma, Adv., for the Respondent No.4.  
Mr. K.K. Trivedi, Advocate for the intervenor-contractors.  
Mr. Ansuman Singh, Advocate for the intervenors-farmers.

JUDGMENT  
(11.11.2009)

Per: A.K. PATNAIK, C.J.

The petitioner No.1 is a senior social activist of Narmada Bachao Andolan and was a member of the World Commission on Dams. The petitioners No.2 to 7 are persons affected by the canals of Omkareshwar and Indira Sagar Projects in Districts Dhar and Badwani. The petitioners have filed this writ petition under Article 226 of the Constitution as a public interest litigation claiming appropriate reliefs in respect of the work now being carried on by respondents No.1 and 2 in connection with the canals of the Indira Sagar and Omkareshwar Projects on the Narmada river.

2. The background facts are that the Narmada Valley development projects consists of several large and medium dam projects. Indira Sagar and Omkareshwar Dam Projects are two such projects in the State of Madhya Pradesh. For the Indian Sagar Project, which was earlier known as Narmada

Sagar Project, the Government of India, Ministry of Environment and Forests, granted environmental clearance by Office Memorandum dated 24<sup>th</sup> June, 1987 and for the Omkareshwar multipurpose Project, the Government of India, Ministry of Environment and Forests, granted environmental clearance by Office Memorandum dated 13<sup>th</sup> October, 1993. After the construction of the Indira Sagar and Omkareshwar dams, the construction of the main and branch canals of the Indira Sagar Project started in 1991 and the construction of main and branch canals of the Omkareshwar Project started in 2006. The petitioners have filed this writ petition praying that no work on the canals be carried out without the execution of Resettlement and Rehabilitation Plans and without completion of Command Area Development Plans and without approval of these plans by the Union Ministry of Environment and Forests. The petitioners have also prayed that agricultural land in the Narmada region which is already irrigated be protected and displacement of persons be minimised by construction of the canal network. The petitioners have further prayed that the land acquisition process be quashed and no canal excavation work be carried out without prior consultation with the Gram Sabha in accordance with the provisions of the Panchayat (Extension to Schedule Areas) Act, 1996] (for short "the PESA Act").

3. On 23.6.2009, the Court after hearing Ms. Medha Patkar for the petitioners issued notices to the respondents and thereafter on 1.7.2009 after hearing the parties took the view that if the Court does not pass any order of status quo and the Court finally declares the acquisition proceedings void and directs restoration of the land to the land owners and if the State continues to spend more money on excavation of land and on construction of the canals, the State will suffer greater loss. The Court was of the further view that the better course

in the public interest would be to hear the writ petition as early as possible and decide the matter and in the meantime the respondents should maintain status-quo on the excavation work for the canal and in respect of land acquisition proceedings and accordingly passed an order of status quo on 1.7.2009.

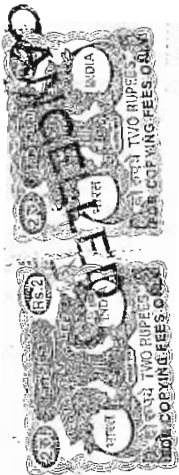
4. On 1.7.2009, the Court allowed the application for intervention I.A. No.6658/2009 filed by Nilesh Patidar, Amichand Patidar, Chand Khan Mansoori, Shivraj Singh, Inder Singh Sisodia and Joginder Singh. Again on 8.10.2009, the Court allowed the application for intervention I.A. No.9582/2009 filed by M/s Goodwill Advance Construction Company Ltd. which has been entrusted with part of the work of excavation of canals. Replies have been filed by respondents No.1, 2 and 3. Counsel for the parties and the interveners were heard at length on 08.10.2009, 09.10.2009, 14.10.2009, 20.10.2009, 21.10.2009, 22.10.2009, 23.10.2009, 27.10.2009 and 28.10.2009.

#### Issue relating to environment

5. Ms. Medha Patkar appearing for the petitioners submitted that the Office Memorandum dated 24<sup>th</sup> June, 1987 of the Government of India, Ministry of Environment and Forests granting environmental clearance to the Indira Sagar Project clearly contemplated that Command Area Development Plan will be prepared and made available to the department and further stipulated that the Narmada Control Authority will ensure that environmental safeguard measures are planned and implemented *pari passu* with the progress of the work on the project. She submitted that similarly the Office Memorandum dated 13<sup>th</sup> October, 1993 of the Government of India, Ministry of Environment and Forests stipulated that Command Area Development Plan will be prepared and submitted in March, 1994. She submitted that the Office Memorandum dated 24<sup>th</sup>



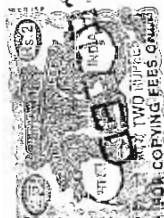
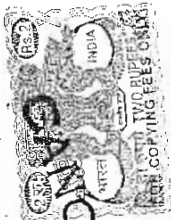
June, 1987 and the Office Memorandum dated 13<sup>th</sup> October, 1993 of the Government of India, Ministry of Environment and Forests therefore granted environmental clearance subject to the condition that Command Area Development Plans are prepared in advance and submitted to the department. She submitted that the letter dated 1<sup>st</sup> July, 2009 of the Secretary, Government of India, Ministry of Environment and Forests to the Chief Secretary, Government of Madhya Pradesh annexed to the rejoinder of the petitioners would show that the Command Area Development Plan of the Omkareshwar Multipurpose project has not been submitted to the Ministry of Environment and Forest, Government of India. She referred to the para 8 of the affidavit filed on behalf of the Ministry of Environment and Forest, Government of India (respondent No.3), which also states that till date the Ministry has not received the Command Area Development Plan of Omkareshwar Multipurpose project. She submitted relying on para 3.13 of the writ petition that the lands in villages which have been acquired for Indira Sagar canals and Omkareshwar canals are being irrigated by Narmada water through pumps and pipelines or through strong and deep wells owned by individual farmers and only a small portions of such land are not irrigated. She further submitted relying on para 3.13.2 of the writ petition that many villages in Badwani and Dhar districts which have already lost land and houses because of the Sardar Sarovar Project, are now going to be affected by the Indira Sagar Project canals and Omkareshwar project canals. She also submitted that some of the project affected families have received special rehabilitation package and have purchased alternative land but such land has again been acquired for the canals. She vehemently argued that if Command Area Development Plans for Indira Sagar and Omkareshwar Projects were prepared in time and submitted, all these problems would have been avoided. She argued that in




the absence of Command Area Development Plans of the two projects, no canal excavation work should be carried out and the entire land acquisition process should be stalled.

6. Mr. Vijay Paranjpye appeared as a Technical Expert on behalf of the petitioners and submitted that Command Area Development Plan is necessary to ensure that the irrigation benefits of a dam project are maximised and must be prepared alongwith the detailed project report of the dam project. He further submitted that the Indira Sagar Project canals and the Omkareshwar Project canals are to irrigate regions in Madhya Pradesh which have black cotton soil and black cotton soil absorbs and retains water and the Command Area Development Plan must therefore ensure a proper drainage system as otherwise there will be water logging and other adverse environmental consequences. He submitted that if Command Area Development Plan is prepared before the canals are built, the alignment of the canals will be proper. Mr. Paranjpey filed documents in support of his submissions and cited para 85 of the judgment of Kripal, J. in *Narmada Bachao Andolan vs. Union of India and others*, (2000) 10 SCC 664, in which there is a reference to a note sent by the Secretary, Ministry of Environment and Forest to the Prime Minister stating inter alia that environmental management plan should be implemented *pari passu* with engineering and other works in the Narmada Sagar and Sardar Sarovar projects for harmonising the environmental conservation needs with the development effort. He also referred to a statement in para 85 of the Judgement of Kripal, J. in *Narmada Bachao Andolan* showing the costs and benefits of the Narmada Sagar and the Sardar Sarovar Dam. He submitted that benefits of a dam project can be optimised if the Command Area Development Plan is submitted alongwith the detailed project report of the dam.

7. Mr. Ravish Agrawal, learned senior counsel appearing for the respondents No.1, 2, 5 and 6, relying on the Additional Return filed on behalf of the respondents No.1, 2, 5 and 6, submitted that it would have been a paper formality, if detailed Command Area Development Plans of Indira Sagar Project and Omkareshwar Project were submitted in the years 1987 and 1993 at the time of environmental clearance because the ground realities substantially change if construction of the Canals is undertaken long after the preparation of the Command Area Plans. He submitted that the statutory notifications under sub-section (2) of Section 3 of the Environment (Protection) Act, 1986 requiring environment clearance to different development projects became effective only in the year 1994 as has been held in para 126 of the judgment in **Narmada Bachao Andolan vs. Union of India and others** (supra) and hence the environmental clearances issued by the Government of India, Ministry of Environment and Forests in the years 1987 and 1993 in the case of Indira Sagar and Omkareshwar Projects were not statutory but essentially administrative in nature. He further submitted that under the Government of India (Allocation of Business) Rules made under Clause (3) of Article 77 of the Constitution, Command Area Development is allocated to the Ministry of Water Resources and not to the Ministry of Environment and Forests and that the Central Water Commission, an expert body of the Ministry of Water Resources, is the authority which approves major and medium irrigation works, water management, etc. He submitted that on a query made by the Principal Secretary & Member (R), Narmada Valley Development Authority, Government of Madhya Pradesh by D.O. letter dated 16.10.2009, the Central Water Commission has opined in the communication dated 23.10.2009 annexed to the Additional Return as Annexure R-2/B that Command Area





Development Plan does not have any bearing on the design, layout/construction of main and branch canals. He submitted that in any case a comprehensive Command Area Development Plan for Indira Sagar Project was submitted to the Ministry of Environment and Forests alongwith the letter dated 21.08.1992 by Narmada Valley Development Authority, Government of Madhya Pradesh, a copy of which is annexed to the Additional Return as Annexure R-2/C and a command area study of Indira Sagar Project and Omkareshwar Project was conducted by the Indian Institute of Science, Bangalore in April, 1985 and was submitted to the Ministry of Environment and Forests alongwith the letter dated 21.08.1992 of the Narmada Valley Development Authority, Government of Madhya Pradesh. He further submitted that recently by letters dated 16.10.2009 (Annexure R-2/D and E), Command Area Development Plans of Indira Sagar Project and Omkareshwar Project have been submitted to the Government of India. He submitted that infact by a recent notification dated 17.9.2009, a copy of which has been annexed to the Additional Return as Annexure R-2/F, the Government of India, Ministry of Environment and Forests has set up an independent Committee of Experts to monitor and review canals and command area - development of Omkareshwar Project and this Committee is already monitoring and reviewing canals and command area development of Indira Sagar Project. He cited the observations in the majority judgment of Kripal, J in **Narmada Bachao Andolan vs. Union of India and others** (supra) in para 126 that change in environment does not per se violate any right under Article 21 of the Constitution of India. He also relied on the majority judgment of Rajendra Babu, J in **N.D. Jayal and another vs. Union of India and others**, (2004) (9) SCC 362 in which the contention of the petitioners therein that the work of Tehri Dam should be stopped till the conditions attached to the environmental clearance dated 19.7.1990 including submission

of Command Area Development Plan was rejected with the finding that the petitioners have not established that the project work was being carrying out without complying with the conditions of clearances, although they had produced materials to show that there were lapses at certain stages which had been taken care of by the monitoring agencies.

**Findings with reasons :**

8. The Office Memorandum dated 24<sup>th</sup> June, 1987 of the Government of India, Ministry of Environment and Forests by which environment clearance was given to the Narmada Sagar Project now renamed as Indira Sagar Project stipulated in paras 4 and 5 :

"4. The NCA has been expanded and its terms of reference have been amplified to ensure that environmental safeguard measures are planned and implemented to depth and in its pace of implementation *pari passu* with the progress of work on the project.

5. After taking into account all relevant facts the Narmada Sagar Project, Madhya Pradesh and the Sardar Sarovar Project, Gujarat are hereby accorded environmental clearance subject to the following conditions:

- i The Narmada Control Authority (NCA) will ensure that environmental safeguard measures are planned and implemented *pari passu* with progress of work on projects.
- ii The detailed surveys/studies assured will be carried out as per the schedule proposed and details made available to the Department for assessment.
- iii The Catchment Area Treatment Programme and the Rehabilitation Plans be so drawn as to be completed ahead of reservoir filling.



- iv The Department should be kept informed of progress on various works periodically."

Paragraphs 4 and sub-para (i) of para 5 of the Office Memorandum dated 24<sup>th</sup> June, 1987 of the Government of India, Ministry of Environment and Forests quoted above would show that the Narmada Control Authority (NCA) was to ensure that the environmental safeguard measures are planned and implemented *pari passu* with the progress of work on the project. This means that alongwith the engineering and other works the environmental management plan was to be made and implemented as contemplated in the note of the Secretary, Ministry of Environment and Forest to the Prime Minister quoted in para 8 of the judgment of Kripal, J in **Narmada Bachao Andolan vs. Union of India and others** (supra).

9. The Office Memorandum dated 13<sup>th</sup> October, 1993 of the Government of India, Ministry of Environment and Forests by which environmental clearance was given to the Omkareshwar Multipurpose project states:

"The proposal was considered from environmental angle and approved subject to implementation of the following mitigative measures pari-passu with the project construction:

X X X X  
X X X X  
X X X X  
X X X X  
X X X X  
X X X X  
X X X X

(viii) A detailed Command Area Development Plan should be prepared and submitted in March, 1994 so that benefit stream can be ensured as proposed.

X X X X

X X X X  
X X X X  
X X X X

(xiii) The Ministry should be kept informed every 6 months of the follow up action taken on the recommendations and the project should be initiated only after ensuring that all arrangements to execute the environmental mitigative measures have been made as a part and parcel of the project."

The Office Memorandum dated 13<sup>th</sup> October, 1993 of the Government of India, Ministry of Environment and Forests relating to Omkareshwar Multipurpose Project is thus clear that environmental mitigative measures were to be taken *pari passu* with the project construction and a detailed Command Area Development Plan was to be prepared and submitted in March, 1994 and the Ministry of Environment and Forests was to be kept informed every 6 months of the follow up action taken on the recommendations and that the project was to be initiated only after ensuring that all arrangements to execute the environmental mitigative measures have been made as part and parcel of the project. Thus in the case of Omkareshwar Multipurpose Project also environmental mitigative measures were to be planned alongwith the project to be undertaken and all arrangements to execute the environmental mitigative measures were to be made as part and parcel of the project.

10. Relevant paragraphs of the reply dated 23<sup>rd</sup> October, 2009 of the Central Water Commission on which Mr. Agrawal relied are extracted hereinbelow:

"The Command Area Development (CAD) now forms an integral part of the project to ensure that the irrigation potential created is fully utilized. The CAD would encompass all aspects of water management for efficient and equitable distribution of water in the commands of irrigation projects for optimal utilization in a

participatory manner. As per the Guidelines for "Preparation of Detailed Project Report of Irrigation and Multipurpose Projects, 1980", the Detailed Project Report (DPR) of a project is prepared to include separate chapters of (i) Irrigation planning, (ii) CAD and (iii) Estimates.

Whereas all engineering works from source of supply up to outlet are covered in main DPR, all engineering work in Command area comprising of land levelling and shaping construction of water courses lined or unlined, field channels, field drains and field roads are to be covered in Command Area development report. Detailed Project Report and Command Area Development Report shall be submitted together.

The guidelines further stipulate that provisions in the estimate for Earthwork covering main/branch canal(s) shall be based on detailed surveys of main/branch canal(s). Therefore it implies that at the stage of approval of a DPR itself, the alignment of main canal and branch canals have been finalised as provision in the estimates are based on detailed surveys. Therefore it is felt that the Command Area Development Plan, as reported to have not been finalised for the present should not have any bearing on the design, layout/construction of Main and Branch canals."

According to the opinion of the Central Water Commission, therefore, Command Area Development Plan now forms an integral part of the project to ensure that the irrigation potential created is fully utilised and covers all aspects of water management for efficient and equitable distribution of water in the commands of irrigation projects for optimal utilisation in a participatory manner and therefore the Command Area Development Report is to be submitted along with the detailed project report, but where the Command Area Development Plan is not finalised, it would not have any bearing on design, layout/construction of main and branch canals. This opinion of the Central Water Commission does not mention whether



environmental safeguards or mitigative measures are to be planned before construction of the main canals and branch canals. In other words, the opinion of the Central Water Commission in the reply dated 23<sup>rd</sup> October, 2009 is only on the engineering aspects and not on the environmental aspects of command area development.

11. In *N.D. Jayal and another vs. Union of India and others* (supra) relied upon by Mr. Agrawal, Rajendra Babu, J delivering the majority judgment has observed in para 45 at page 390 of (2004) 9 SCC:

“Command area development primarily aims to avert the problems of waterlogging and emergence of salinity. This is very important in maintaining the environmental balance.”

In *Narmada Bachao Andolan vs. Union of India and others* (supra) cited by Mr. Agrawal, Kripal, J speaking for the majority has held in para 126 at page 728 of (2000) 10 SCC:

“Change in the environment does not per se violate any right under Article 21 of the Constitution of India especially when ameliorative steps are taken not only to preserve but to improve the ecology and environment and in case of displacement, prior relief and rehabilitation measures take place *pari passu* with the construction of the dam.”

The aforesaid observations in two Supreme Court judgements are emphatic that to prevent water logging and salinity and to maintain the ecology and environment, ameliorative steps have to be planned and implemented *pari passu* with the construction of the project.


12. We are thus of the considered opinion that the Command Area Development Plans of Indira Sagar and Omkareshwar projects were required to be prepared and submitted to the

authority entrusted with the responsibility of monitoring planning and implementation of environmental safeguards and this was to be done before the commencement of the work of the canals so that such authority could ensure that the environmental safeguards and mitigative measures had been properly planned and could be implemented *pari passu* with the construction of the canal project. Hence before acquiring land for construction of the canal network of the Command Area and before excavating such land for construction of the canal network, the Command Area Development Plans ought to have been scrutinised by the authority entrusted with the responsibility of ensuring that environmental safeguards or environmental mitigative measures were properly planned and could be implemented along with the engineering works of the canal project. We are also of the considered opinion that if land is acquired and excavated and canals are constructed before preparation and submission of the Command Area Development Plans to such monitoring authority, environmental safeguards or mitigative measures cannot be implemented *pari passu* with the construction of the canal project. Rather if the main canals and branch canals are constructed without keeping in mind the environmental requirements, there may be immense problem of water logging and salinity disturbing the environmental plans and the authority entrusted to ensure that environmental safeguards and mitigative measures are implemented may not be able to reverse the acquisition of land and work done on the excavation and the construction of main canals and branch canals because of the legal consequences of acquisition of land and the heavy expenditure incurred by the State on acquisition of land, excavation work and construction work of the canals.


13. We however find that by letter dated 21.08.1992 of the Narmada Development Authority, a comprehensive Command

Area Plan was sent to Smt. Nalini Bhatt, Scientist (S.E.), Government of India, Ministry of Environment and Forests. Along with the letter, a report prepared by the Indian Institute of Science, Bangalore in April, 1985 on the basis of study of the composite command of Narmada Sagar and Omkareshwar Reservoirs work had also been sent to Smt. Nalini Bhatt, Scientist (S.E.), Government of India, Ministry of Environment and Forests. We also find that by letters dated 16.10.2009 (Annexure R-2/D and Annexure R-2/E), the Chief Conservator of Forest sent copies of the Command Area Development Plan of the Indira Sagar Project and the left bank canal of the Omkareshwar Project. In the two letters, the Chief Conservator of Forest of Madhya Pradesh has also mentioned that endeavor will be made to ensure that Command Area Development Plan is implemented alongwith development of irrigation facilities. We also find that a notification dated 17.9.2009 of the Government of India, Ministry of Environment and Forests has been issued saying that the Committee of Experts which was constituted for the Sardar Sarovar and Indira Sagar Projects on 2.9.2008 will also monitor and review the canals and Command Area Development of Omkareshwar Project and this Committee includes Dr. Pavan Kumar, Director (Environment) of the Narmada Control Authority. Until this Committee of Experts scrutinises the Command Area Development Plans submitted to the Ministry of Environment and Forests and communicates its decision to the Respondent No.1, there should be no further acquisition of land for the canal network and there should be no further excavation of land and construction of canal network. In a recent decision **Karnataka Industrial Areas Development Board vs. C. Kenchappa and others**, AIR2006 SC 2038 in para 97 at page 2049 of the AIR the Supreme Court has taken the view that principles of "Sustainable Development" should be followed and before acquisition of





land for development, the consequence and adverse impact of development must be properly comprehend.



Issue relating to consultation with Gram Sabha.

14. Ms. Medha Patkar appearing for the petitioner submitted that Part IX titled "The Panchayats" was inserted in the Constitution by the Constitution (Seventy Third Amendment) Act, 1992 with effect from 24.4.1993. She submitted that Article 243M of the Constitution stipulated that nothing in Part IX shall apply to the Scheduled Areas referred to in clause (1) of Article 243 of the Constitution but Clause (4) of Article 243M provided in sub-clause (b) that notwithstanding anything in the Constitution, Parliament may, by law, extend the provisions of Part IX to the Scheduled Areas subject to such exceptions and modifications as may be specified in such law. She submitted that in exercise of this power under sub-clause (b) of clause (4) of Article 243M of the Constitution, Parliament has made the PESA Act. She submitted that Section 4 of the PESA Act expressly provides that notwithstanding anything under Part IX of the Constitution, Legislature of a State shall not make any law under Part IX which is inconsistent with any of the features indicated in clauses (a) to (o) of Section 4 of the PESA Act. She submitted that in clause (i) of Section 4 of the PESA Act it is provided that the Gram Sabha or the Panchayats at the appropriate level shall be consulted before making acquisition of land in the Scheduled Areas for development projects and before re-settling or rehabilitating persons affected by such projects in the Scheduled Areas. She argued that acquisition of land for the Indira Sagar and Omkareshwar canal projects therefore could only be made after consultation with the Gram Sabha. She argued that only after the Command Area Development Plan containing the proposal for constructing the canal network

in the concerned village is placed before the Gram Sabha and the views of the Gram Sabha are taken, the process for acquisition of land in Scheduled Areas for the Indira Sagar and Omkareshwar canal projects could not be initiated.

15. Ms. Patkar submitted that after this writ petition was filed and after the Court passed orders on 1.7.2009 directing maintenance of status-quo with regard to acquisition of land and excavation work for the canal, the respondent No.1 has hastily and arbitrarily passed orders on 30.7.2009 that the concerned Janpad Panchayat of the areas through which the canal network was proposed to be constructed is required to be consulted. She submitted that the order dated 30.7.2009 passed by the respondent No.1 for consultation with Janpad Panchayat instead of Gram Sabhas of the concerned villages is not in accord with the object of Section 4(i) of the PESA Act. She submitted that the object of Section 4(i) of the PESA Act is to be found in Article 40 of the Constitution which provides that the State shall take steps to organise village panchayats and endow them with such powers as may be necessary to enable them to function as units of self-government. She submitted that to achieve this object in Article 40 of the Constitution, Part IX was inserted in the Constitution by the Seventy Third Constitution Amendment. She submitted that in Part IX, 'Gram Sabha' has been defined in Article 243(b) to mean a body consisting of persons relating to a village comprised within the area of Panchayat at the village level. She argued with all force that if the object of self-government is to be achieved, before making acquisition of land for a development project and before re-settling or rehabilitating persons affected as provided in Section 4(i) of the PESA Act, the Government must have prior and informed consultation with the Gram Sabha of the concerned village in which the development work is to be undertaken. She submitted that the application of



respondents No.1, 2, 5 and 6 numbered as I.A. No.9118/2009 would show that in a malafide and arbitrary manner the respondent No.1 has consulted the Janpad Panchayats instead of the Gram Sabhas. She submitted that the order of State Government dated 30.7.2009 providing for consultation with Janpad Panchayats instead of Gram Sabhas is therefore vitiated by malafide, arbitrariness and is violative of Article 14 of the Constitution. She vehemently submitted that since consultation with Gram Sabha is mandatory and since there has been no consultation with regard to re-settling and rehabilitation of the villagers in the Scheduled Areas likely to be affected, the Court should quash the land acquisition proceedings and direct the respondents to consult the Gram Sabha after informing the villagers about the details of proposed canal network which may affect the villagers.

16. Mr. Agrawal, learned senior counsel appearing for the respondents 1, 2, 5 and 6, on the other hand, submitted that Article 40 of the Constitution is only a Directive Principle of State Policy and Article 37 of the Constitution clearly states that the Directive Principles shall not be enforceable by any Court. He submitted that the State Legislature has power under Articles 245 and 246 of the Constitution read with Entry 5 of List-II of the Schedule VII of the Constitution to make law on local Government for the purpose of local self-government or village administration. He submitted that the provisions in Part IX of the Constitution are clear. Parliament has no power to legislate on Panchayats and Gram Sabhas. He referred to the provisions of Article 243A and 243C, 243D, 243G, 243H and 243K which confer power on the state legislature to make law on different aspects of Panchayats and Gram Sabhas. He submitted that the State Legislature has made the Madhya Pradesh Panchayat Raj Avam Gram Swaraj Adhiniyam, 1993 but has not made any provision therein for consultation with

Gram Sabha or any Panchayat before acquisition of law in Scheduled Areas for development projects as provided in Section 4(i) of the PESA Act and therefore Section 4(i) of the PESA Act has no legal effect and cannot be enforced by the Court. He cited Principles of Statutory Interpretation by Justice G.P. Singh 11<sup>th</sup> Edition – 2008 in which it is stated at page 557 that it is not permissible to Parliament to do indirectly what it is prohibited to do directly. He vehemently argued that since Parliament has no power to legislate on any matter relating to self-government or village administration including Gram Sabha and Panchayats, Parliament could not make the PESA Act even indirectly relating to Panchayats and Gram Sabhas.

17. Mr. Agrawal submitted that as a matter of fact acquisitions of land for the Indira Sagar Project and Omkareshwar Dam Project have not been made under any law made by State Legislature but under the Land Acquisition Act, 1894, a Central Act, and a Division Bench of this Court has already held in *Naresh Singh and others vs. Union of India and others*, AIR 2009 MP 26 that the embargo in Section 4(i) is not on Parliament but on Legislature of a State and therefore Section 4 (i) of the PESA Act does not apply to acquisition of land made under the Land Acquisition Act, 1894. Mr. Agrawal submitted that without prejudice to the aforesaid stand of the State Government, the State Government has consulted the concerned Gram Sabhas in the Scheduled Areas and as many as 324 Gram Sabhas have approved, 28 have not approved and 10 Janpad Panchayats have approved the acquisitions of land for the canals. He cited the decision of the Supreme Court in *State of Jammu & Kashmir vs. A.R. Zakir and others*, 1992 (Suppl) 1 SCC 548 for the proposition that "consultation" does not mean "concurrence" and that a writ or direction cannot be issued by the High Court to the legislature to make a law.



*Findings with reasons:*

18. Mr. Agrawal is right in his submission that the Legislature of a State has power to make laws for the whole or any part of the State in respect of any of the matters in List II in the VIIth Scheduled of the Constitution under Articles 245 and 246 of the Constitution, but as would be clear from the opening words of Article 245 of the Constitution such power of the Legislature of the State to make any law in respect of any matter in List II in the VIIth Schedule of the Constitution is "subject to the provisions of this Constitution". Thus, even if the Legislature of the State of Madhya Pradesh has exclusive power to make a law on Local Government and Local Authorities for the purpose of local self-government or village administration covered under Entry 5 of List II in the VII Schedule of the Constitution, such power of the State Legislature of Madhya Pradesh is subject to the provisions of the Constitution including the provisions in Part IX of the Constitution. The provisions in Part IX of the Constitution deal with various aspects of the panchayats such as Gram Sabha (243A), Constitution of Panchayats (243B), Composition of Panchayats (243C), Reservation of seats in Panchayats (243D), Duration of Panchayats etc. (243E), Disqualification for membership of Panchayat (243F), Powers, authority and responsibility of Panchayat (243G), Powers to impose taxes by, and Funds of, the Panchayats (243H), Audit and accounts of Panchayats (243J) and Elections to Panchayats (243K), but Article 243M states that nothing in Part IX shall apply to the Scheduled Areas referred to in clause (1) of Article 244. Article 243M((4)(b) however states:

"(4)Notwithstanding anything in this Constitution:

(a) .....





(b) Parliament may, by law, extend the provisions of this Part to the Scheduled Areas and the tribal areas referred to in clause (1) subject to such exceptions and modifications as may be specified in such law, and no such law shall be deemed to be an amendment of this Constitution for the purposes of article 368."

Article 243M(4) thus begins with a non-obstante clause and states that notwithstanding anything in the Constitution Parliament may, by law, extend the provisions of Part IX to the Scheduled Areas subject to such exceptions and modifications as may be specified in such law. The result is that to Scheduled Areas referred to in clause (1) of Article 244 of the Constitution, none of the provisions in Part IX of the Constitution apply and only Parliament has the power to make a law extending the provisions of Part IX to the Scheduled Areas subject to such exceptions and modifications as may be specified in such law made by the Parliament. It is in exercise of this power under Article 243M(4)(b) that Parliament has enacted the PESA Act in the year 1996. Sections 3 and 4(i) of the PESA Act which are relevant for this case are quoted hereinbelow:

"3. The provisions of Part IX of the Constitution relating to Panchayats are hereby extended to the Scheduled Areas subject to such exceptions and modifications as are provided in Section 4.

4. Notwithstanding anything contained under Part IX of the Constitution, the Legislature of a State shall not make any law under that Part which is inconsistent with any of the following features, namely:-

(i) the Gram Sabha or the Panchayats at the appropriate level shall be consulted before making the acquisition of land in the Scheduled Areas for development projects and before re-settling or rehabilitating persons affected by such projects in the Scheduled Areas; the actual planning and implementation of the projects in



the Scheduled Areas shall be coordinated at the State level."

Thus, by provisions of Section 4(i) of the PESA Act, the Legislature of a State was prohibited from making any law under Part IX of the Constitution inconsistent with the feature that the Gram Sabha or the Panchayats at the appropriate level shall be consulted before making the acquisition of land in the Scheduled Areas for development projects and before resettling or rehabilitating persons affected by such projects in the Scheduled Areas.

19. We find that after the PESA Act, the Legislature of the State of Madhya Pradesh has by MP Act 43 of 1997 inserted Chapter XIV-A titled "Special provisions for panchayats in the Scheduled Areas" in Madhya Pradesh Panchayat Raj Avam Gram Swaraj Adhiniyam, 1993 (for short 'the Adhiniyam, 1993') and thereafter also amended some of the provisions of Chapter XIV-A by the MP Act 5 of 1999 and the MP Act 23 of 2001. On a detailed examination of the provisions of Sections 129-A to 129-F in Chapter XIV-A of the Adhiniyam, 1993 as amended, we do not find therein any provision requiring consultation with the Gram Sabha or the Panchayats at the appropriate level before acquisition of land for a development project or before rehabilitation and re-settlement of persons affected by a development project in Scheduled Areas, and the vires of the Special provisions for Panchayats in the Scheduled Areas in Chapter XIV-A of the Adhiniyam, 1993 have also not been challenged in this writ petition. The State Legislature, in our considered opinion, ought to have made a provision in the Adhiniyam, 1993 in accordance with Section 4(i) of the PESA Act providing for consultation with the Gram Sabha or Panchayats at the appropriate level before acquisition of land in the village for development projects or before resettlement and rehabilitation of persons affected by such projects but in the absence of any special provision in the Adhiniyam, 1993

requiring consultation with the Gram Sabha or Panchayats at the appropriate level before making acquisition of land in the Scheduled Areas for development projects, the Court cannot issue a direction or mandamus to the respondent No.1 to consult the Gram Sabha before acquisition of land or before rehabilitation and re-settlement of persons affected by a development project in Scheduled Areas nor can the Court hold that the acquisitions of lands in Scheduled Areas without consultation with the Gram Sabha in accordance with Section 4(i) of the PESA Act are null and void. Moreover, as has been held by this Court in *Naresh Singh and others vs. Union of India and others* (supra), the embargo in Section 4(i) of the PESA Act is not on Parliament but on the Legislature of a State and therefore Section 4(i) of the PESA Act does not apply to land acquisition under a Central Act namely the Land Acquisition Act, 1894 unless a provision in the law is made by the State Legislature that land in Scheduled Areas will not be acquired under the Land Acquisition Act, 1894 without consultation with the Gram Sabha or the Panchayats at the appropriate level as provided in Section 4(i) of the PESA Act.

**Issue relating to rehabilitation and re-settlement:**

20. Ms. Patkar submitted that the Office Memorandum dated 24.6.1987 of the Government of India, Ministry of Environment and Forests granting environmental clearance for the Indira Sagar Project shows that details were also sought from the project authorities on rehabilitation master plans. She submitted that the O.M. dated 13<sup>th</sup> October, 1993 of the Ministry of Environment and Forests for the Omkareshwar Multipurpose project stipulated in clause (vii) that the rehabilitation programme should be extended to landless labourers and the people affected due to canal by identifying and allocating suitable land as permissible and a time bound programme was to be submitted by December, 1993. She

submitted that the definition of 'displaced person' in paragraph 1.1(a) to whom rehabilitation was to be provided covered not only a person affected by construction of dam but also a person affected by construction of a canal of the project. She submitted that strangely enough the respondent No.1 has taken a stand in its reply that persons affected by construction of canal are not entitled to the benefits of rehabilitation and resettlement and this is because of an order passed by respondent No.2 in July, 2003 so as to exclude a person otherwise affected by the project from the definition of "displaced person". She submitted that persons or families displaced on account of submergence or on account of acquisition of land for canal equally are deprived of their livelihood because of the project and therefore a rehabilitation and resettlement policy which gives benefits to persons affected by submergence of a dam but at the same time denies such benefits to persons affected by construction of canals is based on a classification which has no rational nexus with the object of the policy and is discriminatory and is violative of Article 14 of the Constitution. She also submitted that once the respondent No.1 had promised and assured all project affected persons of the Narmada Valley Project rehabilitation benefits, it cannot now retract from such promise and assurance in the year 2003 by an order passed by the Respondent No.2.

21. Mr. Agrawal submitted that the definition of "displaced persons" on rehabilitation policy will not include the canal affected persons. He further submitted that in **Narmada Bachao Andolan vs. Union of India and others** (supra), Kripal, J in his majority judgment in para 169 at page 742 of the SCC has agreed with the view that canal affected families need not be treated on a par with oustees in the submergence area as there is a basic difference in the impact of the project in the upstream submergence area and in the beneficiary zone of

the command area where the canal affected person continue to live. He submitted that if the canal affected persons have been left out from the benefits of rehabilitation by the order of respondent No.2 in 2003, the policy cannot be held to be discriminatory and violative of Article 14 of the Constitution.

*Findings with reasons :*

22. The majority judgment of Kripal, J in *Narmada Bachao Andolan vs. Union of India and others* (supra) held in para 169:

"Dealing with the contention of the petitioners that there will be 23,500 canal-affected families and they should be treated on a par with the oustees in the submergence area, the respondents have broadly submitted that there is a basic difference in the impacts of the projects in the upstream submergence area and its impacts in the beneficiary zone of the command area. While people, who were oustees from the submergence zone, required resettlement and rehabilitation, on the other hand, most of the people falling under the command area were in fact beneficiaries of the projects and their remaining land would now get relocated with the construction of the canal leading to greater agricultural output. We agree with this view and that is why, in the award of the Tribunal, the State of Gujarat was not required to give to the canal-affected people the same relief which was required to be given to the oustees of the submergence area."

Para 169 of the majority judgment of Kripal, J quoted above in *Narmada Bachao Andolan* would show that in the award of the Narmada Water Disputes Tribunal, State of Gujarat was not required to give to the canal-affected people the same relief which was required to be given to the oustees of the submergence area and the Supreme Court agreed with the broad submission made by the respondents in the case that there is a basic difference in the impacts of the projects in the upstream submergence area and its impacts in the beneficiary zone of the command area inasmuch as people in the submergence area require re-settlement and rehabilitation but people falling under command area were in fact beneficiaries of the projects and their remaining land would get relocated

with construction of canal leading to greater agricultural output.

23. The majority judgment of Kripal, J in **Narmada Bachao Andolan** however held in para 166 that each State has its own package and that the liberalisation of the packages by the three States need not be to the same extent and the States could not be faulted if the package which is offered, is more liberal than the one envisaged in the Tribunal's award. As Kripal, J., has held :

" The resettlement and rehabilitation packages in the three States were different due to different geographical, local and economic conditions and availability of land in the States. The liberal packages available to the Sardar Sarovar Project oustees in Gujarat are not even available to the project-affected people of other projects in Gujarat. It is incorrect to say that the difference in R&R packages, the packages of Gujarat being the most liberal, amounts to restricting the choice of the oustees. Each State has its own package and the oustees have an option to select the one which was most attractive to them. A project-affected family may, for instance, choose to leave its home State of Madhya Pradesh in order to avail the benefits of the more generous package of the State of Gujarat while other PAFs similarly situated may opt to remain at home and take advantage of the less liberal package of the State of Madhya Pradesh. There is no requirement that the liberalisation of the packages by the three States should be to the same extent and at the same time, the States cannot be faulted if the package which is offered, though not identical to each other, is more liberal than the one envisages in the Tribunal's award."

Hence the rehabilitation and re-settlement package of the State of Gujarat which did not treat canal affected families at par with the oustees in the submergence area or the award of the Narmada Water Disputes Tribunal cannot be the basis for refusing rehabilitation and re-settlement of the canal affected

families in the State of Madhya Pradesh. We have to examine the terms of clearances of the Indira Sagar and Omkareshwar Projects given by the Government of India, Ministry of Environment and Forests and the policy of rehabilitation and resettlement as formulated by the State of Madhya Pradesh to decide whether the canal affected persons and families of the Indira Sagar and Omkareshwar projects are to be treated at par with persons and families affected by submergence on account of the two dams.

24. The Office Memorandum dated 24.6.1987 of the Government of India, Ministry of Environment and Forests granting environmental clearance to the Indira Sagar Project stated in para 2 :

" On the basis of examination of details on these projects by the Environmental Appraisal Committee for River Valley Projects and discussions with the Central and State authorities the following details were sought from the Project authorities:

- i. Rehabilitation Master Plan.
- ii. Phased Catchment Area Treatment Scheme.
- iii. Compensatory Afforestation Plan.
- iv. Command Area Development.
- v. Survey of Flora and Fauna.
- vi. Carrying capacity of surrounding area.
- vii. Seismicity; and
- viii. Health Aspects."

Thus, it will appear from para 2 of the O.M. dated 24<sup>th</sup> June, 1987 quoted above that prior to the environmental clearance details with regard to Rehabilitation Master Plan had been sought from the project authorities in the course of discussion with the Central and State authorities. It is not known whether such Rehabilitation Master Plan included rehabilitation of the canal affected persons of the Indira Sagar Project, but it appears from the Rehabilitation Policy of the State of Madhya Pradesh for Narmada Valley Projects that all persons affected



by submergence or otherwise on account of the Narmada River Projects were entitled to the benefits of Rehabilitation Policy.

25. In para 1.1(a) and 1.1(b) of the Rehabilitation Policy, 1989, a "displaced person" and a "displaced family" have been defined. Paras 1.1(a) and 1.1(b) of the Rehabilitation Policy, 1989, are extracted hereinbelow:

1.1(a) Displaced Person :

Any person who has been ordinarily residing or carrying on any trade or vocation for his livelihood for at least one year before the date of publication of notification under Section 4 of the Land Acquisition Act or has been cultivating land for atleast three years before the date of such notification in an area which is likely to come under submergence whether temporary or permanent because of the project or is otherwise required for the project.

1.1(b) Displaced Family:

(i) A family composed of displaced persons as defined above shall mean and include husband, wife and minor children and other persons dependent on the head of the family, eg. Widowed mother, widowed sister, unmarried sister, unmarried daughter or old father.

(ii) Every son who has become major on or before the date of notification under Section 4 of the Land Acquisition Act, will be treated as a separate family."

A reading of the underlined portion of the definition of displaced person in clause 1.1(a) of the Rehabilitation Policy 1989 quoted above would show that not only persons in an area which is likely to come under submergence, whether temporary or permanent, because of the project but also persons in any area which is otherwise required for the project came within the definition of displaced person. The expression "area otherwise required for the project" will obviously cover area




sought to be acquired for the canals and the canal network. It is further clear from clause 1.1(b) of the Rehabilitation Policy 1989 quoted above that a "displaced family" is composed of displaced persons as defined in clause 1.1(a) of the Rehabilitation Policy 1989. Thus, the Rehabilitation Policy of the Government of Madhya Pradesh as it was in 1989 applied to not only persons displaced by submergence of areas by Narmada Valley Projects but also to persons displaced by canal projects of the Narmada Valley Projects.

26. Moreover, on a reading of the different provisions of the Rehabilitation Policy 1989 of the Government of Madhya Pradesh for the oustees of Narmada Projects, it appears that the entitlement of displaced persons or displaced family are linked with the extent of land that such displaced persons/families lose on account of the project. This is illustrated by clause 3 of the Rehabilitation Policy relating to allotment of agricultural land which is extracted hereinbelow in extenso:

"3.0 Allotment of Agricultural Land:

- 3.1 Displaced families would be rehabilitated in accordance with their preferences on land at the new sites, taking as far as possible, the social groups as a unit.
- 3.2(a) Every displaced family from whom more than 25 percent of its land holding is acquired in revenue villages or forest villages shall be entitled to and be allotted land to the extent of land acquired from it, subject to provision in 3.2(b) below.
- (b) A minimum area of 2 ha. of land would be allotted to all the families whose lands would be acquired irrespective of whether government land is offered or private land is purchased for allotment.



Where more than 2 ha. of land is acquired from a family, it will be allotted equal land, subject to a ceiling of 8 ha.

- (c) The government will assist displaced families in providing irrigation by well/tube-well or any other method on the land allotted, provided such land is not already irrigated. In case the allotted land cannot be irrigated (which fact would be certified by the Agriculture Department), the displaced family will be allotted a minimum of 4 hectares of land instead of 2 hectares provided at 3.2 (b) above. In other cases, where irrigation is not possible, the development of dry land would be subsidized by the State Government to the extent of 75% of the cost involved, unless higher subsidies are provided to farmers in any other scheme of the Government.

### 3.3 Entitlements of Encroachers for allotment of land:

Encroachers, whether on revenue land or forest land will also be entitled for the allotment of land. Where the area of the land acquired from an encroacher is up to 1 ha. he will be entitled to 1 ha. area of land. In those cases where acquisition of land from an encroacher is more than 1 ha., he will be entitled to 2 ha. of land irrespective of the fact that the land acquisition from such an encroacher may be even greater than 2 ha."

A reading of clause 3.2(a) would show that only if 25% of land of displaced family is acquired, the displaced family will be entitled to allotment of agricultural land. Where a displaced family loses less than 25% of its land by acquisition on account of the project, it will not be entitled to allotment of agricultural land. Clause 3.2(b) further states that a minimum area of 2 ha. of land will be acquired but where more than 2 ha. of land is acquired from a family, it will be allotted 2 ha. of land subject to a ceiling of 8 ha. Thus, depending upon the extent of land lost by a displaced family, agricultural land was

to be allotted to a displaced family. Clause 3.3 of the rehabilitation policy quoted above would further show that encroachers, whether on revenue land or forest land, will also be entitled for agricultural land to the extent indicated therein.

27. The Rehabilitation Policy of 1989 stated the broad principles for rehabilitation of displaced families in para 1 and one of the clauses of para 1 stated:



"The displaced families would be rehabilitated, maintaining the existing structure of social groups as far as possible in the command area or near the periphery of the affected areas in accordance with their preferences."

It will be clear from the clause of para 1 of the Rehabilitation Policy quoted above that the displaced families were to be rehabilitated as far as possible in the command area or in the periphery of the affected areas in accordance with their preference. Hence, displaced families of the subinerged areas were to be rehabilitated in the command area if they so preferred and were to benefit from the canals in the same way as families who are affected by the canals but who continue in their remaining land in the command area.

28. The Rehabilitation Policy 1989 also provides in Clause 9 rehabilitation benefits for landless displaced family and reads thus :

"9.0 Landless Displaced Families :

9.1 Special efforts will be made for the effective rehabilitation of landless displaced families. Adequate arrangements will be made by the Narmada Valley Development Authority for the upgradation of existing skills or important of new skills so as to promote full occupational rehabilitation. In this regard, new opportunities emerging as a result of the project

will be fully used for the benefit of the displaced families. Suitable provisions will be incorporated in the tender document of Local Competitive Bidding (LCB) and other forms to ensure the employment of displaced persons. The Narmada Valley Development Authority will ensure appropriate arrangement for discharge of these responsibilities within a stipulated timeframe. In the interim time, special financial assistance will be given to supplement the income of the landless agricultural labourers and the landless scheduled castes and scheduled tribe oustees families for 3 years in descending order, which shall be in addition to the grant-in-aid mentioned in para 6.1. This period of three years will be calculated from the payment year of the grant-in-aid under para 6.1. Thus, a landless oustee family will get a special income support amount of Rs.2,250/-, Rs.5,500/- and Rs.2,750/- in the second, third and fourth year of displacement, respectively. In addition, a further sum of Rs.12,500/- shall be kept in reserve for every landless oustee family and shall be made available for executing an independent viable scheme for earning livelihood or for purchase of productive assets. The above support amounts will be 75%, 50% and 25% respectively of the poverty line and the amount to be kept in reserve is also linked with the poverty line. If the scale of poverty line is revised, the amount of special support amount and the reserve shall also be proportionately increased accordingly. For other landless families special financial assistance of Rs.19,500/- will be given for the purchase of productive assets."

Hence, landless displaced families have also been given rehabilitation and re-settlement benefits under the policy of Rehabilitation for Narmada Valley Project of the Government of Madhya Pradesh.

29. Thus, under the Rehabilitation Policy, 1989, rehabilitation and resettlement benefits to be given to displaced persons, displaced families and landless displaced families are linked with the extent to which the displaced family or

displaced person was affected by a Narmada Valley Project and the displaced families if they so preferred, were to be rehabilitated in the Command Area and were to be beneficiaries of the canals in the same way as those displaced by the canals who were to continue to live in the Command Area. This kind of policy which has taken care of differences of impacts of the project on the person or the family whether on account of submergence or on account of the canal net work must apply equally to all displaced persons and displaced families of the Narmada Valley Project, irrespective whether the persons or families have been displaced because of submergence on account of the construction of the dam or because of land acquisition for construction of the canal net work. For these reasons, the definition of 'displaced person' in the Rehabilitation Policy as made in 1989 included a person affected by the Project otherwise than by submergence and the Rehabilitation Policy was to apply to all persons displaced by the Project, i.e. by submergence or otherwise.

30. We further find that the O.M. dated 13.10.1993 of the Government of India, Ministry of Environment and Forests granting environmental clearance to the Omkareshwar Multipurpose Project stipulated in para (vii) :

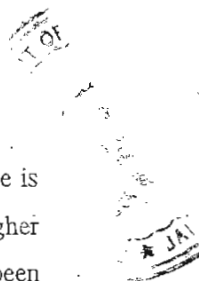

" The Rehabilitation Programme should be extended to landless labourers and the people affected due to canal by identifying and allocating suitable land as permissible. A time bound programme should be submitted by December, 1993."

The language in the stipulation in para (vii) of the OM dated 13.10.1993 would show that the rehabilitation programme was to be extended to landless labourers and the people affected due to canal by identifying and allocating suitable land as permissible and was not to be confined to only people affected by submergence because of construction the dam.

31. After having declared the policy of rehabilitation and resettlement making no distinction between people affected by the submergence and people affected by the canals, the respondent No.2 appears to have taken a decision in 2003 to exclude persons in areas otherwise affected by a project of the Narmada River from the benefits of the Rehabilitation Policy and confining the definition of "displaced persons" to only persons in areas affected by submergence, temporary or permanent on account of the project. In 2003 respondent No.2 has classified displaced persons in two groups, one affected by submergence, permanent or temporary, and the other not affected by submergence and has extended the benefits of rehabilitation and re-settlement only to the group, which is affected by submergence. Though there is an intelligible differentia in making this classification, in our considered opinion, such differentia has no rational nexus with the object sought to be achieved by the rehabilitation policy. The object of the rehabilitation policy is to ensure that persons displaced by Narmada Valley Projects are better off and their right to livelihood guaranteed under Article 21 of the Constitution is not violated. As we have seen, the Rehabilitation Policy of the Government of Madhya Pradesh itself contains provisions which grants rehabilitation benefits to displaced persons and displaced families depending on the extent of impact suffered by the person or family displaced by the project and the displaced families are to be rehabilitated in the Command Area or in the periphery of the Command Area as per their preference. In our considered opinion, the stand taken by the respondents No.1 and 2 in the return that the impacts on people affected by submergence and the people affected by the canal network are different justifying different treatment to submergence affected persons and canal affected persons has no rational basis. The rationale of the policy of the State of

Gujarat in not treating canal affected persons on par with the submergence affected persons discussed in para 129 of the majority judgment of Kripal, J., in **Narmada Bachao Andolan** is not available to the State of Madhya Pradesh on account of the peculiar features of its policy of rehabilitation as discussed above. The order of the respondent No.1 made in the year 2003 excluding persons in areas otherwise affected by the project, in our view, does not satisfy the test of intelligible differentia having rational nexus with the object sought to be achieved by the Rehabilitation Policy and is therefore discriminatory and violative of Article 14 of the Constitution of India and the order of Respondent No.1 made in the year 2003 in so far as it excludes canal affected persons from the definition of "displaced family" is therefore ultra vires the Constitution.

32. We are conscious that if rehabilitation and re-settlement benefits are to be provided to all the canal affected persons in accordance with the rehabilitation policy for oustees of Narmada Project of the Government of Madhya Pradesh, respondents No.1 and 2 will have to incur heavy costs for the canal projects of Indira Sagar and Omkareshwar. But according to us, as rehabilitation and re-settlement are part of the constitutional obligation of the State Government under Article 21 of the Constitution to the displaced persons, particularly those belonging to the tribes, the respondent No.1 has to find the resources for rehabilitation and re-settlement of the canal affected persons and cannot circumvent this constitutional obligation by issuing an order that the Rehabilitation Policy will not apply to the canal affected persons. This constitutional obligation under Article 21 of the Constitution towards persons displaced by the canal project will also ensure that the displacement of persons by the project is minimised and areas which are already irrigated and which do not need better means of irrigation are not unnecessarily



covered in the Command Area Development Plan and there is no unwarranted burden on the public exchequer due to higher costs of the project. Moreover, in recent times, there has been growing resistance of the local inhabitants to acquisitions of land by Governments for development projects because they have lost confidence in public authorities and are not quite sure whether they will be true to their public commitments and assurances to rehabilitate and resettle them once the development project comes through and is commissioned. Considering all these aspects, we are inclined to direct the respondents No.1 and 2 to provide rehabilitation and resettlement benefits of the Rehabilitation Policy of the Government of Madhya Pradesh to the canal affected persons of the Indira Sagar and Omkareshwar Projects.

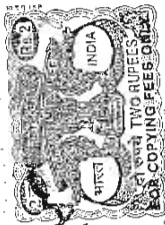
**Issue relating to land acquisition and compensation:**

33. Ms. Patkar submitted that the land acquisition for the canal work has been done by invoking the urgency clause under Section 17 of the Land Acquisition Act, 1894 and even the inquiry under Section 5-A of the Land Acquisition Act, 1894 has been dispensed with. She submitted that the invocation of the urgency clause under Section 17 and the dispensing with the inquiry under Section 5-A have violated the right of the oustees whose land has been acquired is as much as they cannot raise any objection to the land acquisition and are denied a hearing in accordance with Section 5-A of the Land Acquisition Act, 1894. She submitted that the Indira Sagar and the Omkareshwar dam projects were conceived several decades back and the environmental clearances were given for the two projects in 1987 and 1993 respectively and there were no emergency circumstances warranting invocation of the urgency clause in Section 17 of the Land Acquisition Act, 1894 and requiring dispensing with the inquiry under

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Section 5-A of the Land Acquisition Act, 1894. She submitted that in **Union of India and others vs. Krishan Lal Arneja and others**, AIR 2004 SC-3582, the Supreme Court has taken a view that Section 17 of the Land Acquisition Act, 1894 confers extra-ordinary powers on the authorities to dispense with the normal procedure laid down under Section 5-A of the Act in exceptional case of urgency and such powers cannot be lightly resorted to except in case of real urgency enabling the Government to take possession of the land proposed to be acquired for public purpose. In the aforesaid decision, she submitted, the Supreme Court has further held that a public purpose however laudable it may be by itself is not sufficient for the authorities to take the aid of Section 17 to use the extra-ordinary power as use of such power deprives the land owner of his right to file objections to the proposed acquisition of his property and it also dispenses with the inquiry under Section 5-A of the Act. She also relied upon **Union of India and others vs. Mukesh Hans**, (2004) 8 SCC 14, in which the Supreme Court has also held that existence of urgency or unforeseen emergency though is a condition precedent for invoking Section 17(4) of the Land Acquisition Act, 1894, that by itself is not sufficient to direct dispensing with the inquiry under Section 5-A of the Act and it requires an opinion to be formed by the Government concerned that alongwith the existence of such urgency or unforeseen emergency there is also a need for dispensing with Section 5-A inquiry. Ms. Patkar vehemently submitted that the proceedings for acquisition of land for the Indira Sagar and Omkareshwar Canal Projects in which urgency clause in Section 17 of the Land Acquisition Act, 1894 and in which the inquiry under Section 5-A of the Act has been dispensed with be set aside by the Court. She further submitted that the compensation for acquisition of land paid to the oustees is thoroughly inadequate and this Court should direct the respondents to pay reasonable



compensation in accordance with the Rehabilitation Policy of the State Government for Narmada Valley Project.



34. Mr. Ravish Agrawal, on the other hand, relying on para 9 of the Additional Return filed on 28.10.2009 on behalf of the respondents, submitted that till 28.10.2009 the records of cases of acquisition of land for the canals of Indira Sagar and Omkareshwar projects show that in 355 cases awards have been passed and compensation has been disbursed to the land owners and Section 17 of the Land Acquisition Act, 1894 has been invoked in 302 cases. He further submitted relying on relying on the Additional Return filed on 28.10.2009 that 336 land acquisition cases are in process out of which in 100 cases the urgency clause in Section 17 has been invoked. Relying on para 10 of the Additional Return filed on 28.10.2009, he further submitted that the petitioners No.2 and 3 have not suffered any acquisition of land and in the case of petitioner No.4 his land has been acquired and award has been passed and the petitioners No.5, 6 and 7 have also accepted the award amount for the land required from them. Mr. Agrawal submitted that most of the awards in land acquisition cases were passed during 2003 to 2006 and the writ petitioner which has been filed in 2009 should be dismissed for delay and laches on the part of the petitioner to approach this Court against the land acquisition proceedings. He cited *Swaika Properties (P) Ltd. and another vs. State of Rajasthan and others*, (2008) 4 SCC 695, in which the Supreme Court considering its earlier decisions in *Municipal Corporation of Greater Bombay vs. Industrial Development Investment Co. Pvt. Ltd. and others*, (1996) 11 SCC 501, *State of Rajasthan vs. D.R. Laxmi*, (1996) 6 SCC 445, *Municipal Council, Ahmednagar vs. Shah Hyder Beig*, (2000) 2 SCC 48 and *C. Padma vs. Dy. Secretary to Government of Tamil Nadu*, (1997) 2 SCC 627, has taken a view that where a writ

petition is filed after possession has been taken over and after the award has become final, it deserves to be dismissed on the ground of delay and laches. Mr. Agrawal further submitted that the reasonableness of compensation paid for land acquisition under an award is a matter for the Civil Court to decide under Section 18 of the Land Acquisition Act, 1894 and the High Court should not decide this question in this writ petition.

35. Considering the consistent view of the Supreme Court in the cases cited by Mr. Agrawal that the Court should not entertain a writ petition challenging acquisition of land after possession of the land has been taken over and awards have become final, we are not inclined to examine the issue with regard to the validity of the land acquisition proceedings in this public interest litigation in which the facts of the individual cases of acquisition as to when possession was taken and awards became final are not on record. In case the oustee whose land is acquired for canal projects approaches this Court in a separate and independent writ petition, the challenge may be considered on its own merits. For the same reasons, we are also not inclined to go into the question whether reasonable compensation has been determined in the awards as these are matters to be decided by the Civil Court under Section 18 of the Land Acquisition Act, 1894.

**Authority to ensure implementation of environmental and rehabilitation measures:**

36. Before we part with this case, we would like to decide the authority which will ensure implementation of environmental safeguards and rehabilitation-re-settlement measures as directed in this order. In exercise of powers conferred by Section 6-A of the Inter-State Water Disputes Act, 1956, the Central Government has framed a scheme by




notification dated 10<sup>th</sup> September, 1980 inter alia constituting the Narmada Control Authority. Sub-clause (1) of clause 9 of the Scheme as amended by the notification dated 3<sup>rd</sup> June, 1987 and sub-clause (2) of clause 9 of the Scheme read as follows:

“9(1) The role of the authority will mainly comprise of overall coordination and direction of the implementation of the projects including the engineering works, the environmental protection measures and the rehabilitation programmes and to ensure faithful compliance of the terms and conditions stipulated by the Central Government at the time of clearance of the projects.

(2) The authority shall be charged with the power and shall be under a duty to do any or all things necessary, sufficient and expedient for the implementation of the orders with respect to-

- (i) the storages, apportionment, regulation and control of the Narmada waters;
- (ii) sharing of power benefits from Sardar Sarovar project;
- (iii) regulated releases by Madhya Pradesh;
- (iv) acquisition by the concerned State for Sardar Sarovar project of lands and properties likely to be submerged under Sardar Sarovar;
- (v) compensation and rehabilitation and settlement of outstees; and
- (vi) sharing of costs.”



It is thus clear from a reading of sub-clause (1) of clause 9 of the Scheme as amended by the notification dated 3<sup>rd</sup> June, 1987 that the Narmada Control Authority (NCA) has been statutorily vested with the role of overall coordination and direction of the implementation of the environmental protection measures and the rehabilitation programmes and also to ensure faithful compliance of the terms and conditions stipulated by the Central Government at the time of the clearance of the projects. It is also clear from sub-clause (2) of clause 9 of the Scheme quoted above that the Narmada Control Authority (NCA) is charged with the power and is under a duty to do any or all

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things necessary, sufficient and expedient for the implementation of the orders with regard to acquisition of land by the concerned State for the project and compensation, rehabilitation and settlement of oustees. The Narmada Control Authority has been impleaded as respondent No.4 in this writ petition. We are of the considered opinion that the respondent No.4 through its agencies or otherwise, should monitor the environmental protection measures, the acquisition of land, compensation and the rehabilitation and settlement of the oustees in accordance with the observations and directions in this order.

37. In the result, we direct that :

- (i) no further acquisition of land, excavation or construction of the canal network for the Command Area of the Indira Sagar and Omkareshwar projects will be undertaken, until the Command Area Development Plans submitted to the Government of India, Ministry of Environment and Forests, are scrutinised by the Committee of Experts constituted for the Sardar Sarovar, Indira Sagar and Omkareshwar Projects by the Notifications dated 2.9.2008 and 17.9.2009 and until this Committee of Experts communicates its clearance in respect of the particular work to the respondents No.1 and 2;
- (ii) the respondents No.1 and 2 will provide rehabilitation and re-settlement benefits of the Rehabilitation Policy of the Government of Madhya Pradesh for Narmada Valley Project to the displaced persons and displaced families of the Indira Sagar and Omkareshwar Canal Projects and



will constitute a Grievance Redressal Authority which will decide the complaints of such displaced persons and displaced families regarding rehabilitation and resettlement;

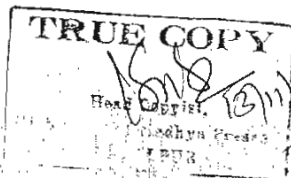
- (iii) the respondent No.4 will ensure that the two directions in (i) and (ii) above are implemented by the respondents No.1 and 2 and that the environmental safeguards and rehabilitation measures are planned and implemented pari-passu with the works of the Indira Sagar and Omkareshwar Canal Projects;
- (iv) the respondent No.4 will submit a report once every three months to this Court on whether the respondents No.1 and 2 are implementing the directions in this order.

The writ petition is disposed of with the aforesaid directions. The interim order of status quo is vacated. The parties will bear their own costs.

*SA*  
(A.K. Patnaik)  
Chief Justice  
11.11.2009

*SA*  
(Ajit Singh)  
Judge  
11.11.2009

YS/



149

GCPB-1982-DCGPB-19-3-05-1,00,000

11-10

CJ

Application received on	Application told to appear on	Application appeared on	Application (with or without further/ correct particulars) sent to the Record Keeper/ Dealing Assistant on	Application (with or without record, and for further or correct particulars, if any required) received from the Dealing Assistant/Record Keeper on	Application given : notice for further or correct particulars on	Application given : notice for further funds on	Notice in Sr. No. (6) or (7) completed with on	Copy ready on	Copy delivered on	Court fee realized
1	2	3	4	5	6	7	8	9	10	11
50-11-11	50-11-11	13-11-09						13-11-09	13-11-09	168

Copyist

Head Copyist

50/11/09

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Annexure - XLVII-13

नर्मदा घाटी विकास प्राधिकरण  
नर्मदा भवन, 59 - अरेरा हिल्स भोपाल

क्र.सं. 1  
दिनांक 9/4/09  
9/4/09

क्रमांक/पर्या.एवं वन/तक./09/521

भोपाल दिनांक 08-04-2009

प्रति,

✓ कार्यकारी सदस्य,  
नर्मदा नियंत्रण प्राधिकरण,  
नर्मदा सदन, स्कीम न.74 सी  
विजय नगर, इंदौर - 452010

विषय: नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 47 वीं बैठक हेतु एजेन्डा नोट भेजने बाबत।

संदर्भ :- नर्मदा नियंत्रण प्राधिकरण का पत्र क्रमांक पर्या. 3(47)/2009/404 दिनांक 26 मार्च 2009

0

विषयांगत सदरित पत्र के तारतम्य मे लेख है कि नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की आयोजित होने वाली 47 वीं बैठक के एजेन्डा नोट में शामिल किये जाने हेतु तीन एजेन्डा संलग्न प्रेषित है।

कृपया उक्त एजेन्डा 47 वीं बैठक में शामिल किये जाने हेतु अनुरोध है। 46 वीं बैठक के कार्यवृत्त पर टीप पृथक से तैयार कर प्रेषित की जावेगी।

संलग्न :-

(एजेन्डा नोट)

1  
उपाध्यक्ष,  
न.घा.वि.प्रा.भोपाल



## AGENDA FOR 47<sup>TH</sup> MEETING OF ENVIRONMENTAL SUB GROUP

### COST SHARING OF ESTABLISHMENT OF KATHIWADA WILD LIFE SANCTUARARY:

Govt. of India while according clearance for diversion of forest land for SSP had stipulated following condition vide letter No. No.8-372/83-FC dated 6<sup>th</sup> January 1989 (Annexure I):

- “(xii) For conservation and management of wildlife, a Committee will be constituted by the State Govt. by 31<sup>st</sup> January, 1989 which will include a representative from the Government of India. The Committee will suggest the necessary steps to be taken and draw up a plan which will be implemented at the cost of the project”.

In compliance to above condition, Govt of M.P. had constituted wild life committee vide order no.F-5/59/83/10/3 dated 29.05.90 (Annexure II). Wild life committee had proposed establishment of two sanctuaries i.e. Mathwad & Kathiwada and recommended expenditure of Rs. 21.76 crores & 13.97 crores respectively (Anexxure III). Subsequently Wild Life Institute of India, Dehradun (WII) had been entrusted to carry out EIA study in the area. WII had submitted its report in February 2008 and recommended establishment of Kathiwada wild life sanctuary in Jhabua district. Executive summary of report of WII is annexed as Annexure IV. Report of WII had been accepted by GoMP in principle and GoMP is in the process of declaring Kathiwada sanctuary and examining the proposal from various angles. In the mean time NVDA had approved expenditure of Rs. 13.94 crores at 2002 price level on 17.06.08 (Annexure V).

M.P. Forest department while examining the report of WII had found that establishment of Kathiwada sanctuary will require relocation of 6 villages and will involve expenditure of Rs. 50.7 crores (Annexure VI). Thus establishment of Kathiwada sanctuary will involve total expenditure of Rs.64.67 crores.

The establishment of sanctuary is a condition imposed by GoI MoEF, for diversion of forest land required for Sardar Sarovar Project and the Sardar Sarovar Project include three units as follows:-

Unit I	Dam
Unit II	Canals
Unit III	Power House

Thus cost to be incurred on establishment of Kathiwada had to be loaded on all three units of Sardar Sarovar Project and is to be shared between all four states viz. Madhya Pradesh : Gujarat : Rajasthan : Maharashtra in proportion 14 : 77 : 3 : 6. It is, therefore, proposed that the cost of establishment of Kathiwada sanctuary is to be shared in 14: 77:3:6 proportion between all four states viz. Madhya Pradesh : Gujarat : Rajasthan : Maharashtra.

The Environmental Sub Group may approve and recommend the same to NCA.

True copy dated 3-8-11-07

No.8-372/83-FC  
Government of India  
Ministry of Environment and Forests,  
(Department of Environment, Forests and Wildlife)

Paryavaran Bhawan, CGO Complex,  
Lodhi Road, New Delhi-110003

Dated the 6<sup>th</sup> Jan. 1989

To,

The Secretary,  
Agriculture, Forest and Cooperative Department,  
Government of Gujarat,  
Sachivalaya, Gandhinagar.

The Secretary,  
Forest Department,  
Government of Madhya Pradesh,  
Bhopal.

The Secretary,  
Revenue & Forest Department,  
Government of Maharashtra,  
Mantralaya, Bombay.

**Subject :-** Diversion of 13385.45 hectares (6488.54 ha. in Maharashtra, 4165.91 ha. in Gujarat and 2731.00 ha in Madhya Pradesh) of forest land in Dhule, Bhāruḥ and Khargone districts respectively for Sardar Sarovar Project.

**Ref. :-** 1) FLD-1282-78159-V-1, dated 17.2.83, Govt. of Gujarat.  
2) 5/58/83/10/3, dated 31.8.84, Govt. of Madhya Pradesh.  
3) FLD.1080/111531-II-73 dated 8.9.83, Govt. of Maharashtra.

Sir,

In continuation to this office letter of even number dated 8<sup>th</sup> Sept, 1987, I am directed to say that the conditions as stipulated at S.No. (vi) and (xi) in the above letter may be substituted by the following :-

“(vi) A plan for the treatment of the catchment area will be prepared by 31.3.1989 and implemented at the cost of the project”.

“(xi) Fuelwood depot should be set up by the project authorities who will also arrange alternate fuel like coal, kerosene, bio-gas, LPG, electricity, etc. The supply should be free of cost to the labourers and free or at subsidized rate to the other staff, as may be determined by the project authorities.”

True copy dated-8.11.07

The following conditions may also be added at serial (ii) (a) and (xii):

- “(ii)(a) The non-forest area selected shall be surveyed, demarcated and declared as preserved/protected forests and placed under the control of State Forest Department for raising compensatory afforestation at the cost of the project. Area not found suitable shall be substituted by suitable areas”.
- “(xii) For conservation and management of wildlife, a Committee will be constituted by the State Govt. by 31<sup>st</sup> January, 1989 which will include a representative from the Government of India. The Committee will suggest the necessary steps to be taken and draw up a plan which will be implemented at the cost of the project”.

Other terms and conditions remain the same.

Yours faithfully,

sd/-

(S.P. Singh)

Asstt. Inspector General of Forests.

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Annexure II

मध्य प्रदेश शासन  
वन विभाग

क्रमांक स् 5/58/83/10/3,  
प्रति,

भोपाल, दिनांक 29 मई, 1990

प्रधान मध्य वन संरक्षक,  
भोपाल।

विषय:- नर्मदा सागर एवं तरदार सरोवर परियोजना से प्रभावित वन्य जीवों के संरक्षण एवं व्यवस्था हेतु कमेटी का गठन।

शासन के आदेश क्रमांक 5/111/84/10/3 दिनांक 8-1-1988 में

निम्नानुसार संशोधन किया जाता है :-

नर्मदा सागर परियोजना में भारत सरकार पर्यावरण एवं वन मंत्रालय पत्र क्रं 8-646/84 स्.ती. दिनांक 7-10-87 तथा तरदार सरोवर परियोजना में पत्र क्रमांक 8-372/83 स्.ती. दिनांक 6-1-89 की क्रमशः कोडिका 9 एवं 12 में प्राप्त निर्देशों के पालन में दोनों परियोजनाओं में प्रभावित वन क्षेत्र को उपयोग पर देने के कारण प्रभावित वन प्राणियों/पक्षियों के संरक्षण एवं व्यवस्था के लिये शासन द्वारा निम्नानुसार सदस्यों की एक कमेटी गठित की जाती है:-

1. मुख्य वन संरक्षक, वन्य प्राणी, मध्य प्रदेश	सदस्य/संयोजक
2. अपर मुख्य वन संरक्षक, मू. स. व. सं. मध्य प्रदेश	सदस्य
3. मुख्य वन संरक्षक, नर्मदा घाटी विकास प्राधिकरण	सदस्य
4. संचालक, भारतीय वन्य प्राणी संस्थान	सदस्य
भारत सरकार के प्रतिनिधि	
5. राज्य वन्य प्राणी सलाहकार मण्डल के मनोनीत सदस्य	सदस्य
6. वर्ल्ड वाइल्ड लाइफ फंड की स्टेट यूनिट के मनोनीत सदस्य	सदस्य
7. जूओलाजिकल सर्वे ऑफ इंडिया के प्रतिनिधि	सदस्य
8. वाटनीजल सर्वे ऑफ इंडिया के प्रतिनिधि	सदस्य

समिति का नाम "नर्मदा सागर तथा तरदार सरोवर परियोजना के दूव से प्रभावित वन्य प्राणी/पक्षियों के संरक्षण एवं व्यवस्था समिति" होगा।

यह समिति एक समयसमय योजना बनाकर अपने सुझाव सहित शासन को प्रस्तुत करेगी जिसका क्रियान्वयन दोनों परियोजना के व्यय से किया जाएगा।

मध्य प्रदेश के राज्यपाल के नाम से  
तथा आदेशानुसार

विकरण,

-2-

पृ. क्र. स्व. 5/58/33/10/3, मो. नं. दिनांक 22.05.1950  
प्रतिलिपि:-

1. प्रमुख सचिव, नर्मदा घाटी विकास विभाग मो. नं. 5050
  2. अध्यक्ष, नर्मदा घाटी विकास प्राधिकरण, मो. नं. 5050
  3. अपर मुख्य वन संरक्षक, {मू. त. व. त.} मो. नं. 5050 मो. नं. 5050
  4. मुख्य वन संरक्षक, {वन्य प्राणी} मध्य प्रदेश मो. नं. 5050
  5. मुख्य वन संरक्षक, नर्मदा घाटी विकास प्राधिकरण मो. नं. 5050
- मुख्य वन संरक्षक, वन्य प्राणी {तमिति के तंमोजक} कृपया  
क्रमांक 4 से 8 तक के सद्यत्यों को आदेश की प्रति भेजकर प्रतिनिधियों  
के नाम ज्ञात कर शासन को सूचित करें।

अतिरिक्त सचिव,

मध्य प्रदेश शासन, वन विभाग.

29/5

Annexure III

43  
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विषय:-

सरदार सरोवर डूब क्षेत्र के कारण गठित किए जानेवाले अभ्यारण्य से संबंधित प्रस्तावित व्यय का विस्तृत विवरण।

प्रधान मुख्य वन संरक्षक  
का कार्यालय

नर्मदा नदी पर बनाये जाने वाले विभिन्न बाँधों के कारण डूब में आ रहे वनक्षेत्र के कारण वन्यजीवों के संरक्षण हेतु प्रस्तावित योजना के संबंध में समिति द्वारा पूर्व में विचार किया गया था। इंदिरासागर डूब क्षेत्र की प्रतिपूर्ति हेतु एक राष्ट्रीय उद्यान एवं दो अभ्यारण्य, ओकारेश्वर राष्ट्रीय उद्यान एवं सुरमन्या तथा मान्धाता अभ्यारण्य के गठन का प्रस्ताव किया गया था, जिस पर सहमति हो चुकी है। ओकारेश्वर राष्ट्रीय उद्यान एवं सुरमन्या तथा मान्धाता अभ्यारण्य के निर्माण पर रू० (28.62) करोड़ का व्यय अनुमानित किया गया है। व्यय का विवरण पूर्व में दिया जा चुका है। सरदारसरोवर के निर्माण के फलस्वरूप डूब में आ रहे वनक्षेत्र के कारण राज्य वन अनुसंधान संस्थान, जबलपुर द्वारा प्रस्तावित दो अभ्यारण्य क्षेत्र के निर्माण के बारे में समिति ने विचार किया था और समिति ने अपनी अनुशंसा अपनी बैठक दिनोंक 14 नवम्बर, 2002 में किया था। उस बैठक में व्यय का विवरण नहीं दिया गया था। समिति ने मथवाड़ एवं कट्टीवाड़ा अभ्यारण्य के गठन से संबंधित व्यय का विस्तृत विवरण तैयार किया है, जो निम्नानुसार है:-

(1) मथवाड़ अभ्यारण्य	कुल अनुमानित व्यय 21.76 करोड़ रू०
(2) कट्टीवाड़ अभ्यारण्य	कुल अनुमानित व्यय 13.97 करोड़ रू०

कुल अनुमानित व्यय 35.73 करोड़ रू०

समिति द्वारा तैयार दो अभ्यारण्यों के व्यय का अनुमान संलग्न प्रेषित है।

प्रधान मुख्य वन संरक्षक (वन्यप्राणी)  
मध्यप्रदेश, भोपाल।

उपाध्यक्ष, नर्मदा घाटी विकास प्राधिकरण

7(64P)

5-3 (Behn)

280

## Cost Estimates for Kathiwada Sanctuary

Total area of the proposed Kathiwada Sanctuary is 92.33 Sq.Km.. There are 6 villages inside the proposed Sanctuary and 21 villages on the periphery. In wildlife management, Eco-dev, habitat dev., protection, Infrastructure, Research and establishment are the main components. Component wise cost estimates have been prepared as under:-

A. Eco-Development and energy saving measures: The main activities under the Eco-development and energy savings will be:-

- (1) Fuel wood plantation
- (2) Bamboo plantation
- (3) Gobar gas plants
- (4) Pasture development
- (5) Land leveling
- (6) Irrigation
- (7) Nistar Talab
- (8) Construction Wells
- (9) Construction of School building
- (10) Approach Roads etc.

It is proposed that on an average Rs. 15.00 lakhs will be spent on each village for Eco-Development.

Total Cost = 15.00 lakh x 27

= 405 lakhs

B. Habitat Improvement: Food, water and space are the main components of Wildlife habitat and hence following items are proposed:-

(a) Water hole creation

- |  |                    |           |
|--|--------------------|-----------|
| (i) Stop dams --   | 18 @ 4 lakh        | = 72 lakh |
| (ii) Talab   | 40 @ 1 lakh        | = 40 lakh |
| (iii) Maintenance of water hole which includes cleaning and creation of temporary earthen dam (For five years) | 1.60 lakh per year | = 8 lakh  |

(b) Habitat Improvement

- |   |                       |              |
|---|-----------------------|--------------|
| (i) Meadow creation by uprooting woody species. | 10 meadows @ 0.5 lakh | = 5.00 lakh  |
| (ii) Uprooting weeds                            |                       | = 7.00 lakhs |
| (iii) Uprooting of lantana                      |                       | = 7.00 lakh  |



(281)

(iv) Soil and water conservation

= 7.00 lakh

Total (Habitat Improvement)

= 136.00 lakh

C. Protection: Protection is top most priority area of wildlife management. Construction of patrolling camps., erection of barriers, construction of roads, creations of firelines, construction of watch towers, construction wireless tower, wireless sets (fixed mobile hand sets), inoculation of domestic animals, vehicles for speedy communication etc. are the main components of protection.

Survey and demarcation	= 20.00 lakh
Patrolling camps (10) @ 2.00 lakh	= 20.00 lakh
Forester's Qtr- (6) @ 2.5 lakh	= 15.00 lakh
Forest Rangers (2) @ 3.50 lakh	= 7.00 lakh
ACF (1) @ 5.00 lakh	= 5.00 lakh
Checking barriers(5) @ 2.00 lakh	= 10.00 lakh
Roads (100 Km.)@ 1.00 lakh	= 100.00 lakh
Inspection path (75 Km.) @ 0.25 lakh	= 18.75 lakh
Creation of firelines (12 m)-200 Km.@ 0.05 lakh	= 10.00 lakh
(6 m)-400 Km @ 0.025 lakh	= 10.00 lakh
Const. of watch tower (12) @ 1.00 lakh	= 12.00 lakh
Const. of wireless tower (4) @ 2.00 lakh	= 8.00 lakh
Wireless sets	
Fixed (5) @ 0.80 lakh	= 4.00 lakh
Mobile (4) @ 0.80 lakh	= 3.20 lakh
Hand set (15) @ 0.15 lakh	= 2.25 lakh
Binoculars (15) @ 0.15 lakh	= 2.25 lakh
Fire arms (15) @ 0.25 lakh	= 3.75 lakh
Jeep (2) @ 4.00 lakh	= 8.00 lakh
Tractor with Tanker (2) @ 4.50 lakh	= 9.00 lakh
Mazda canter (1) @ 6.00 lakh	= 6.00 lakh
Motor Cycle (12) @ 0.40 lakh	= 4.80 lakh
Fencing with chainink (100 Km) @ 2.00 lakh	= 200.00 lakh
Inoculation of domestic animals (2.00 lakh per year for 5 years)	= 10.00 lakh
Total ( Protection)	= 489.00 lakh

(282)

**D. Infrastructure:**

Rest house (2) @ 25.00 lakh	= 50.00 lakh
Hutments (4) @ 4.00 lakh	= 16.00 lakh
Museum & demonstration centre (1) @ 15.00 lakh	= 15.00 lakh

Publications = 10.00 lakh

Mini bus (1) @ 10.00 lakh = 10.00 lakh

Training to Guides = 2.00 lakh

Signages = 5.00 lakh

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**Total (Infrastructure) = 108.00 lakh**

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**E. Research:**

## Research on

Grassland	
Vegetation	
Preparation of check lists etc.	= 10.00 lakh

GIS, GPS, digitization, Computer, Software = 30.00 lakh

Translocation of animal = 25.00 lakh  
(Tranquilization equipments and medicines and execution of translocations)

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**Total (Research) = 65.00 lakh**

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**F. Establishment:**

Office of ACF (1) @ 5.00	= 5.00 lakh
Office of the Forest Rangers(2) @ 4.00	= 8.00 lakh

Residential for driver(6) @ 1.50 lakh	= 9.00 lakh
Residential LDC (2) @ 2.00 lakh	= 4.00 lakh
Residential Watchmen (2) @ 1.00 lakh	= 2.00 lakh

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Residential for driver (6) @ 1.50 lakh	= 9.00 lakh
Residential LDC (2) @ 2.00 lakh	= 4.00 lakh
Residential Watchmen (2) @ 1.00 lakh	= 2.00 lakh
Residential wireless operators (8) @ 1.00 lakh	= 8.00 lakh
Construction of Garage (6) @ 0.50 lakh	= 3.00 lakh
Const. of Store (2) @ 1.00 lakh	= 2.00 lakh
Electricity connections	= 5.00 lakh
Office Furniture (for 3 offices)	= 3.00 lakh
<b>Total (Establishment)</b>	<b>= 44.00 lakh</b>

**G. Recurring Expenditure @ 30.00 lakh on 5 years** = 150.00 lakh

### Abstract of Cost Estimates:

A. Eco-Development and energy saving measures	= 405.00 lakh
B. Habitat Improvement	= 136.00 lakh
C. Protection	= 489.00 lakh
D. Infrastructure	= 108.00 lakh
E. Research	= 65.00 lakh
F. Establishment	= 44.00 lakh
G. Recurring Expenditure	= 150.00 lakh
<b>Grand Total</b>	<b>= 1397.00 lakh</b>

*(A.P. Divedi)*

*(A.K. DUBEY)*

*(B.P. SINGH)*

Conservator of Forests

6/11/12/02  
Field Director  
Kanha National Park  
Mandla

284 9

## Cost Estimates for Mathwad Sanctuary

Total area of the proposed Mathwad Sanctuary is 237.3 Sq.Km.. There are 15 villages inside the proposed Sanctuary and 18 villages on the periphery. In wildlife management, Eco- dev, habitat dev., protection, Infrastructure, Research and establishment are the main components. Component wise cost estimates have been prepared as under:-

**A. Eco-Development and energy saving measures:** The main activities under the Eco-development and energy savings will be:-

- (1) Fuel wood plantation
- (2) Bamboo plantation
- (3) Gobar gas plants
- (4) Pasture development
- (5) Land leveling
- (6) Irrigation
- (7) Nistar Talab
- (8) Construction Wells
- (9) Construction of School building
- (10) Approach Roads etc.

It is proposed that on an average Rs. 15.00 lakhs will be spent on each village for Eco-Development.

Total Cost = 15.00 lakh x 33 = 505 lakhs

**B. Habitat Improvement:** Food, water and space are the main components of Wildlife habitat and hence following items are proposed:-

(a) Water hole creation

- |  |                    |            |
|--|--------------------|------------|
| (i) Stop dams -  | 28 @ 4 lakh        | = 112 lakh |
| (ii) Talab -   | 55 @ 1 lakh        | = 55 lakh  |
| (iii) Maintenance of water hole which includes cleaning and creation of temporary earthen dam (For five years) | 2.00 lakh per year | = 10 lakh  |

(b) Habitat Improvement

- |  |                       |               |
|--|-----------------------|---------------|
| (i) Meadow creation by uprooting woody species | 15 meadows @ 0.5 lakh | = 7.5 lakh    |
| (ii) Uprooting weeds                           |                       | = 10.00 lakhs |
| (iii) Uprooting of lantana                     |                       | = 10.00 lakh  |

285

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(iv) Soil and water conservation	= 10.00 lakh
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<b>Total (Habitat Improvement)</b>	<b>= 214.50 lakh</b>
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**C. Protection:** Protection is top most priority area of wildlife management. Construction of patrolling camps., erection of barriers, construction of roads, creations of firelines, construction of watch towers, construction wireless tower, wireless sets (fixed mobile hand sets), inoculation of domestic animals, vehicles for speedy communication etc. are the main components of protection.

Survey and demarcation	= 30.00 lakh
Patrolling camps (20) @ 2.00 lakh	= 40.00 lakh
Forester's Qtr. (12) @ 2.5 lakh	= 30.00 lakh
Forest Rangers (2) @ 3.50 lakh	= 7.00 lakh
ACF (1) @ 5.00 lakh	= 5.00 lakh
Checking barriers(5) @ 2.00 lakh	= 10.00 lakh
Roads (200 Km.)@ 1.00 lakh	= 200.00 lakh
Inspection path (150 Km.) @ 0.25 lakh	= 37.50 lakh
Creation of firelines (12 m)-250 Km.@ 0.05 lakh	= 12.50 lakh
(6 m)-600 Km @ 0.025 lakh	= 15.00 lakh
Const. of watch tower (24) @ 1.00 lakh	= 24.00 lakh
Const. of wireless tower (4) @ 2.00 lakh	= 8.00 lakh
Wireless sets	
Fixed (5) @ 0.80 lakh	= 4.00 lakh
Mobile (4) @ 0.80 lakh	= 3.20 lakh
Hand set (15) @ 0.15 lakh	= 2.25 lakh
Binoculars (15) @ 0.15 lakh	= 2.25 lakh
Fire arms (15) @ 0.25 lakh	= 3.75 lakh
Jeep (2) @ 4.00 lakh	= 8.00 lakh
Tractor with Tanker (2) @ 4.50 lakh	= 9.00 lakh
Mazda canter (1) @ 6.00 lakh	= 6.00 lakh
Motor Cycle (12) @ 0.40 lakh	= 4.80 lakh
Fencing with chainink (200 Km) @ 2.00 lakh	= 400.00 lakh
Inoculation of domestic animals (2.00 lakh per year for 5 years)	= 10.00 lakh
<b>Total ( Protection)</b>	<b>= 872.75 lakh</b>

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## D. Infrastructure:

Rest house (2) @ 25.00 lakh	= 50.00 lakh
Hutments (4) @ 4.00 lakh	= 16.00 lakh
Museum & demonstration centre (1) @ 15.00 lakh	= 15.00 lakh

Motor boats (Big) (4) @ 5.00 lakh	= 20.00 lakh
Motor boats(mini)(10) @ 2.50 lakh	= 25.00 lakh

Publications	= 10.00 lakh
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Mini bus (1) @ 10.00 lakh	= 10.00 lakh
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Training to Guides	= 2.00 lakh
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Signages	= 5.00 lakh
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Elephants(2)	= 10.00 lakh
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<b>Total (Infrastructure)</b>	<b>= 163.00 lakh</b>
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## E. Research:

## Research on

Grassland.

Vegetation

Preparation of check lists etc.

= 10.00 lakh

GIS, GPS, digitization, Computer, Software

= 30.00 lakh

Translocation of animal

= 25.00 lakh

(Tranquilization equipments and medicines and execution of translocations)

Reptilia development

= 50.00 lakh

**Total (Research)****= 115.00 lakh**

## F. Establishment:

Office of ACF (1) @ 5.00

= 5.00 lakh

Office of the Forest Rangers(2) @ 4.00

= 8.00 lakh

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Residential Jeep driver(6) @ 1.50 lakh	= 9.00 lakh
Residential LDC (2) @ 2.00 lakh	= 4.00 lakh
Residential Watchmen (2) @ 1.00 lakh	= 2.00 lakh
Residential wireless operators and boat drivers (20) @ 1.00 lakh and Mahawat	= 20.00 lakh
Construction of Garage (6) @ 0.50 lakh	= 3.00 lakh
Const. of Store (2) @ 1.00 lakh	= 2.00 lakh
Electricity connections	= 5.00 lakh
Office Furniture (for 3 offices)	= 3.00 lakh
<b>Total (Establishment)</b>	<b>= 56.00 lakh</b>
<b>G. Recurring Expenditure @ 50.00 lakh on 5 years</b>	<b>= 250.00 lakh</b>

### Abstract of Cost Estimates:

A. Eco-Development and energy saving measures	= 505.00 lakh
B. Habitat Improvement	= 214.50 lakh
C. Protection	= 872.75 lakh
D. Infrastructure	= 163.00 lakh
E. Research	= 115.00 lakh
F. Establishment	= 56.00 lakh
G. Recurring Expenditure	= 250.00 lakh
<b>Grand Total</b>	<b>= 2176.20 lakh</b>

*(Signature)*  
S. Dwivedi

*(Signature)*  
(AKDUREY)

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*(Signature)*  
(B.P. SINGH)  
Conservator of Forests

16/12/02

166

16/12/02  
Field director  
Kanha National Park  
Mondla

WILDLIFE INSTITUTE OF INDIA

# Evaluation of the Ecological and Socioeconomic Consequences of Setting up of Proposed Mathwad Wildlife Sanctuary and Kathiwad Wildlife Sanctuary, Madhya Pradesh

## Project Personnel

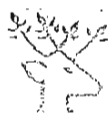
*A. Pragatheesh*  
*Ashish David*

## Principal Investigators

*Asha Rajvanshi*  
*V.B. Mathur*

## Project Leader

*P.R. Sinha*



भारतीय वन्यजीव संस्थान  
Wildlife Institute of India



## EXECUTIVE SUMMARY

The creation of reservoir for Sardar Sarovar Project (SSP) in Gujarat would lead to loss of forest land in Gujarat (4523 ha), Madhya Pradesh (2732 ha) and Maharashtra (9188 ha). Guidelines of Ministry of Environment and Forests (MoE&F), Government of India stipulate that environmental clearance is sought for large projects such as the SSP, studies are to be conducted to assess the impact on flora and fauna present and to devise appropriate conservation measures. Accordingly, the State Forest Research Institute (SFRI) Jabalpur, Madhya Pradesh conducted a study in 1994 on the impact of SSP project on lands to be submerged in Madhya Pradesh and recommended the creation of two wildlife sanctuaries (WLS) to mitigate the negative impacts. The National Valley Development Authority (NVDA), Bhopal assigned the task of evaluating the ecological and economic consequences of setting up of proposed Kathiawad (92 km<sup>2</sup>) and Mathwad (141 km<sup>2</sup>) to the Wildlife Institute of India (WII) under a Memorandum of Understanding (MoU) signed in January, 2007.

The WII team conducted the study from February 2007 to October, 2007 involving desk review; field data collection on ecological and socio-economic characteristics; assessment of human disturbance and remote sensing and GIS analysis.

The land use/land cover classification for the proposed Kathiawad WLS indicate the presence of forest (17.16%), Dry mixed deciduous forest (50.77%), Dry scrub forest (7.67%), Agriculture and Bare ground/Habitation (21.84%) whereas in case of Mathwad WLS the Dry mixed forest (2.59%), Dry scrub forest (57.38%), Agriculture (2.58%), Bare ground/Habitation and River (5.92%) respectively. The proposed Kathiawad WLS has well stocked forests and at places the tree cover density is 0.7 to 0.8 whereas in case of Mathwad WLS the forests are less stocked and the tree cover density is 0.3 to 0.4.

The wildlife track and sign survey conducted during this study indicated the presence of eight species viz. sloth bear, leopard, hyena, jackal, jungle cat, nilgai, langur and rhesus in the proposed Kathiawad WLS all though direct sightings were observed in case of last two only. Sloth bear, hyena and leopard signs were observed in 8, 5 and 3 forest beats respectively while jackal and jungle cat signs were observed in two beats and those of nilgai in one beat. No wildlife track and sign evidence during the reconnaissance survey carried out in proposed

Mathwad WLS indicated the presence of only langur and rhesus macaque and therefore unlike Kathiwad area, detailed field surveys were not undertaken.

Jhabua district in which both the proposed Kathiwad and Mathwad WLS are located, the population is predominantly tribal (86.2%), the main tribes being Bhil, Bhilala and Patelia – the livelihoods are dependent on subsistence agriculture supplemented by wage labour. The entire district is drought prone and owing to lack of irrigation facilities, the tribal cultivators are unable to raise cash crops such as pulses, oilseeds and tobacco. The physiographic density (no. of persons per ha of cultivable land) ranges from 1.12 to 11.85 persons per ha with an average of 5.3 persons per ha of cultivable area in Kathiwad. With the current levels of non-farm occupations, literacy rate and other development parameters included, the Human Development India (HDI) for Jhabua district ranks the lowest among all the districts in the State of Madhya Pradesh.

The dependence on forest based resources of the local population is high. The average reported quantities reveal that 337 kg of fuel wood is required per capital per annum and an average of 15 km distance is traveled by people for fuelwood, fodder and other non-wood timber forest product (NFTFP) collection in Kathiwad area. Distances covered for forest resources collection is much higher in Mathwad area on account of low forest cover and reduced availability of resources.

The shifting cultivation locally called 'nevad' is common in Jhabua district. The presence of 'nevad' is debilitating for wildlife, as 'blanks' are created in the forested areas and cultivation entails an increased level of human disturbance for planting, protecting and harvesting of crops. As per available records, Kathiwad area is relatively less affected by 'nevad' whereas in Mathwad area it ranges between 2% to over 53% of the forest compartment areas.

On the basis of evaluation of the available forest cover, wild animal presence, landscape features (ridges, valleys, water sources, village settlements, proximity to forest areas) – attributes that are vital for survival and reproduction of wildlife occupying and using the area and also considering the socio-economic assessment, the study recommends the establishment of only the proposed Kathiwad WLS and not the Mathwad WLS. The study also recommends the inclusion of forest compartments 8 to 475, 453 and 532 of Bhavra Range (13.67 km<sup>2</sup>) in the proposed Kathiwad WLS as it provides additional habitat of good quality to a number of wildlife species. The total area of proposed Kathiwad WLS would be 106 km<sup>2</sup> (Figure 7.1 and Annexure V).

The establishment of proposed Kathiawad WLS would also enhance the representation of Biogeographic Zones 4B (Semi Arid – Gujarat and Rajputana) and 6A (Central Highlands) as it is located in the ecotonal area of these zones. This is an important conservation planning imperative. The landscape mosaic of existing protected areas (Ratanmal, Jambughoda and Shoolpaneshwar WLS in Gujarat and Sardarpur WLS in Madhya Pradesh) along with the proposed Kathiawad WLS would play an effective role in mitigating the negative impacts of mega development project in the area.

Once the proposed Kathiawad WLS is notified by the Government of Madhya Pradesh, it would be essential to prepare a management plan in order to initiate habitat management and enhanced protection strategies on the one hand and also to implement the range of ecodevelopment and other welfare measures for the resource dependent tribal populations in and around the Kathiawad WLS. In addition to this, watershed development, afforestation and catchment area treatment programmes (prioritized on the basis of directly – indirectly draining watersheds), which provide both environmental and livelihood security to people will have to be implemented in both Kathiawad and Mathwad areas.

Annexure-V



नर्मदा घाटी विकास प्राधिकरण  
नर्मदा भवन, 59, अरेरा हिल्स, भोपाल

क्र. 290.151.ई-2/सचिव/न.घा.वि.प्रा./कार्य/08/728

भोपाल दि. 17/6/08

विषय:- सरदार सरोवर परियोजना के अंतर्गत कठ्ठीवाड़ा अभ्यारण की स्थापना बाबत।

संदर्भ:- माननीय अध्यक्ष महोदय का अनुमोदन दिनांक 16.6.08।

सदस्य वन एवं पर्यावरण के प्रस्ताव है कि सरदार सरोवर परियोजना के कठ्ठीवाड़ा अभ्यारण की स्थापना एवं विकास पर वर्ष 2002 के मूल्यों के आधार पर रु. 1397 लाख के व्यय पर नर्मदा घाटी विकास प्राधिकरण की सहमति वन विभाग को दी जानी है।

अतः नर्मदा घाटी विकास प्राधिकरण के कार्य संचालन नियम भाग-1 की कण्डिका क्रमांक 25 (ii) की आपात मंजूरी की विशेष प्रक्रिया के अंतर्गत रुपये 1397 लाख (रु. तेरह सौ सनतान्वे लाख मात्र) की स्वीकृति दी जाती है।

माननीय अध्यक्ष महोदय के यू.ओ.नोट क्रमांक 219/08 दिनांक 16.6.08 द्वारा अनुमोदित एवं सदस्य (वित्त) का यू.ओ.नोट क्रमांक 702 दि. 17.6.08 द्वारा पृष्ठांकित

सचिव

नर्मदा घाटी विकास प्राधिकरण  
नर्मदा भवन, भोपाल.

प्रतिलिपि :-

1. सदस्य (वित्त), न.घा.वि.प्रा.भोपाल ।
  - ✓ 2. सदस्य (पर्यावरण) न.घा.वि.प्रा.भोपाल ।
  3. महालेखाकार (आडिट-2) म.प्र.भोपाल ।
  4. अतिरिक्त प्रतिलिपि सामान्य शाखा न.घा.वि.प्रा.भोपाल ।
- सूचनार्थ एवं आवश्यक कार्यवाही हेतु।

(17)

Annexure - VI

कार्यालय प्रधान मुख्य वन संरक्षक (वन्यप्राणी), मध्यप्रदेश भोपाल

क्रमांक / मा.चि. / 909  
प्रति,

सदस्य,  
पर्यावरण एवं वन,  
नर्मदा घाटी विकास प्राधिकरण,  
नर्मदा भवन, भोपाल।

विषय : झाबुआ वन मण्डल के परिक्षेत्र कट्ठीवाड़ा में वन्यप्राणी अभ्यारण्य की स्थापना।

संदर्भ : इस कार्यालय का पत्र क्रमांक / मा.चि. / 4869 दिनांक 22.9.2008

विषयान्तर्गत कृपया उक्त संदर्भांकित पत्र का अवलोकन करें। उक्त पत्र के माध्यम से आपको अवगत कराया गया था कि यदि प्रस्तावित अभ्यारण्य में स्थित 6 ग्रामों के ग्रामीण स्वेच्छा से विस्थापित होना चाहेंगे तो इस हेतु रुपये 50.70 करोड़ की अतिरिक्त आवश्यकता होगी। अब चूंकि इस सम्बन्ध में मध्यप्रदेश शासन, वन विभाग द्वारा मंत्रिपरिषद हेतु संक्षेपिका चाही गई है। अतः अनुरोध है कि उक्तानुसार रुपये 50.70 करोड़ की अतिरिक्त राशि प्रदाय करने हेतु सहमति देने का कष्ट करें ताकि शासन को संक्षेपिका प्रेषित की जा सके।

CCF CWL  
प्रधान मुख्य वन संरक्षक (वन्यप्राणी)  
मध्यप्रदेश भोपाल

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1. The first step is to identify the problem.

केवल सरकारी प्रयोग के लिए  
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नर्मदा नियंत्रण प्राधिकरण

**NARMADA CONTROL AUTHORITY**

26 मार्च 2010 को नई दिल्ली में संपन्न  
नर्मदा नियंत्रण प्राधिकरण की पर्यावरण उपदल की  
सैंतालिसवीं बैठक का कार्यवृत्त

**MINUTES OF THE 47<sup>th</sup> MEETING  
OF ENVIRONMENT SUB-GROUP OF  
NARMADA CONTROL AUTHORITY  
HELD AT NEW DELHI ON 26<sup>th</sup> MARCH 2010**

इन्दौर  
अप्रैल, 2010

Indore  
April 2010



**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**  
 (Ministry of Water Resources, Govt. of India)



No. NCA/M(E&R)/47 ESG/2010/ 1040-1125

Date : 21 April, 2010

To:

All the Members/Invitees of Environment Sub Group of  
 Narmada Control Authority  
 (As per list attached)

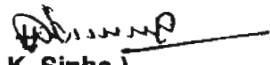
Sub : **Minutes of 47<sup>th</sup> Meeting of Environment Sub Group of Narmada Control Authority**

Sir/Madam,

Please find enclosed herewith a copy of the minutes of the 47<sup>th</sup> meeting of Environment Sub Group of Narmada Control Authority held on 26<sup>th</sup> March, 2010 at New Delhi.

Your comments/observations on the above minutes, if any, may kindly be sent to this office within twenty one days from the date of issue of the minutes.

Yours faithfully,

  
 ( M. K. Sinha )  
 Member (E&R), NCA &  
 Member Secretary, ESG.

Encl: as above

Narmada Sadan.  
 Sector B, Scheme No. 74,  
 Vijay Nagar, Indore-452 010 (M.P.)

नर्मदा सदन, सेक्टर बी, स्कीम नं. 74,  
 विजय नगर, इन्दौर - 452 010 (म.प्र.)

स्वच्छ सुरक्षित जल - सुन्दर सुशहाल कल  
 CONSERVE WATER - SAVE LIFE

Phone No. : Executive Member : 0731- 2557276  
 Fax : Executive Member : 0731-2559888  
 Member (Civil) Telefax : 0731-2553344  
 Member (Power) Telefax : 0731-2551144  
 Member (Env. & Reh.) Telefax : 0731-2554333  
 Secretary : 0731-2554477 Fax : 0731-2553469  
 Web Site : nca.gov.in  
 E-mail : exe.mem.nca@nic.in



**MINUTES OF THE 47<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF THE  
NARMADA CONTROL AUTHORITY HELD ON 26<sup>TH</sup> MARCH, 2010  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

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The 47<sup>th</sup> meeting of Environment Sub-group (ESG) of the Narmada Control Authority (NCA) was held on 26<sup>th</sup> March, 2010 at Paryavaran Bhawan, CGO Complex, New Delhi under the Chairpersonship of Shri Vijai Sharma, Secretary, Ministry of Environment & Forests (MoEF), Govt of India.

List of participants is enclosed at Annexure-XLVII-Min-(1).

The Chairman, at the outset, welcomed all participants to the meeting. After brief self introduction by the participants, the Chairman stated that references from the States of Gujarat and Madhya Pradesh had been received regarding requests for permission for further raising of Sardar Sarovar Dam. During the last meeting of Environment Sub Group, it was decided to constitute a Committee by the MoEF. The Committee has submitted its interim report which has already been circulated to all members/invitees. It was noted that the proposed construction would take about 30 working months (excluding monsoon months), which gives time to ensure compliance of remaining part of the conditions of environmental clearance to make it *pari-passu* as per the clearance conditions.

He, thereafter, requested the Executive Member, NCA to present the agenda items for discussions.

**Item No.XLVII-1(217): CONFIRMATION OF MINUTES OF THE 46<sup>TH</sup> MEETING OF THE ENVIRONMENT SUB-GROUP**

The Executive Member, NCA informed that the 46<sup>th</sup> Meeting of Environment Sub-Group (ESG) of the Narmada Control Authority (NCA) was held on 20<sup>th</sup> June, 2008 and the Minutes of the meeting were circulated to all members/invitees vide NCA office letter Env.3(46)/2008/2439-2479, dated 10.07.08. He informed that the Govts. of Madhya Pradesh & Gujarat have raised certain issues and proposed certain modifications in the minutes of the 46<sup>th</sup> meeting of the Environment Sub Group, as brought out in the agenda.

The Chairman suggested that the views expressed by the Members may be taken on record.

The minutes of the 46<sup>th</sup> meeting of the Environment Sub Group were, accordingly, confirmed.

*This must have been later.*

**Item No.XLVII-2(218) : PRESENTATION OF THE REPORT BY THE COMMITTEE BY MINISTRY OF ENVIRONMENT & FORESTS FOR ASSESSMENT OF SURVEY/ STUDIES/PLANNING AND IMPLEMENTATION OF THE PLANS ON ENVIRONMENT SAFEGUARD MEASURES FOR SARDAR SAROVAR & INDIRA SAGAR PROJECTS.**

The Managing Director, SSNNL, GoG, referred to the various communications sent by State Govt to the Secretary, Ministry of Environment & Forests and to the NCA expressing reservations of Govt. of Gujarat on the constitution of the Committee by MoEF and presentation of its report. He handed over a letter conveying views of Govt. of Gujarat on the presentation of the Pandey Committee's Report (Annexure XLVII-Min.2). He also stated that SSNNL or Govt. of Gujarat was not a party to Court Case No. 6056/2009 before Hon'ble High Court of Madhya Pradesh or to the SLP No. 34065 /2009 before the Hon'ble Supreme Court. The said judgements relate to Indira Sagar & Omkareshwar Projects and are not applicable to Sardar Sarovar Project.

The Vice Chairman, NVDA referred to the communications sent to MoEF & NCA regarding views of the State Govt. of Madhya Pradesh on formation of the Committee. Endorsing the view points expressed by Gujarat, he stated that a mechanism in the form of Environment Committee already exists for verifying the pari-passu compliance and there was no need to constitute a separate Committee outside NCA framework.

Dr. R.K. Katti, Expert Member stated that this Sub group has been guiding the preparation of plans and implementation of Environment Safeguard Measures since more than 20 years. He stated that the constitution of the MoEF Committee should have been first discussed in the Sub Group.

After brief discussions, the Chairman stated that he has taken note of the views of the State Govts. He, thereafter, requested Dr. Devender Pandey to proceed with presentation.

Dr. Devender Pandey, Chairman of the MoEF Committee stated that the Committee has submitted two interim reports; one on the backwater levels and another covering Catchment Area treatment; Flora-Fauna and Carrying Capacity, Compensatory Afforestation, Command Area Development and Health aspects. He stated that findings on the remaining aspects, viz., Seismicity, Archeology & Anthropology, etc., would be submitted later on. He, thereafter, presented the main findings of the Committee. He stated that according to the Committee, the backwater levels were not carried out by Central Water Commission and also not as per NWDT Award. With regard to the parameters covered in the second report, pari-passu compliances were either partial/delayed.

The Commissioner, (PR), MoWR stated that the backwater issue was not included in the Terms of Reference for the MoEF Committee. As per provisions of the Narmada Water Dispute Tribunal Award, Central Water Commission was to determine the backwater levels in consultation with Madhya Pradesh and Gujarat. The studies had been carried out by the Central Water Commission and the same

should have been accepted by the MoEF Committee and Environment Sub-Group. He also objected to some references in the Committee Report, where in the Secretary (Water Resources) & Chairman, NCA has been indicated as responsible for proper implementation of Environment Safeguard Measures. In fact, Narmada Control Authority has constituted Environment Sub Group under the Chairmanship of Secretary (Environment & Forests) to ensure proper implementation of Environment Safeguard Measures in pursuance of the environmental clearance order of Ministry of Environment & Forests. The Hon'ble Supreme Court in its judgment dated 18.10.2000 in WP (Civil) no.319/1994 – Narmada Bachao Andolan V/s Union of India & Others, have also stipulated that the Environment Sub Group under the Secretary, Ministry of Environment & Forests, Govt of India will consider and give at each stage of the construction of the Dam, environmental clearance before further construction beyond 90 meter can be undertaken. The Hon'ble Supreme Court has also stipulated that the permission to raise the dam height beyond 90 meter will be given by the Narmada Control Authority from time to time after it obtains the above mentioned clearance from the Relief & Rehabilitation Sub Group and Environment Sub Group.

Executive Member, NCA stated that the status of implementation of Environment Safeguard Measures indicated in the MoEF Committee Report does not differ from the Status Report brought out by NCA Secretariat and deliberations in the Environment Sub Group meetings.

Member (E&R), NCA pointed out that the status as brought out by the MoEF Committee has already been deliberated in the Environment Sub Group meetings and successive decisions have been taken by the Environment Sub Group taking due consideration of the ground situation. He also pointed out that the MoEF Committee has not considered the field inspections carried out by the Environment Committee in the States of Gujarat, Madhya Pradesh, Maharashtra & Rajasthan during the year 2005-2008 in pursuance of the directions of the Environment Sub Group in its 42nd meeting held on 7th April, 2005. The reports of the Environment Committee had been placed before the Environment Sub Group from time to time and appropriate decisions were taken. It could be seen from the deliberations in the Environment Sub Group that the compliances to the conditions of environment/forest clearances have so far been satisfactory. Referring to the observation of the MoEF Committee with regard to the flash flood on 7th April, 2005, he stated that the reported incident is due to release of water from Indira Sagar Project and not because of any flood event due to non completion of Catchment Area Treatment.

Dr. R.K. Katti, Expert Member stated that the CWC has the necessary experience in carrying out backwater level studies and their findings shouldn't have been questioned. Shri Shekhar Singh, Expert Member stated that the issue is not about backwater level computations but whether pari-passu compliance had been met or not.

Shri B.P. Das, a member of the MoEF Committee wanted to know whether CWC has considered the flood of magnitude as stipulated by NWDT Award/NCA decisions. Member (E&R), NCA confirmed that CWC has considered the flood of magnitude as stipulated by NWDT Award/NCA decisions while computing backwater levels.

In response to invitation for comments from the party States by the Chairman, the representatives of the Govts. of Gujarat and Madhya Pradesh stated that they do not intend to make any observation on the MoEF Committee's report and the presentation in view of their objections to the formation of the Committee itself.

Summarizing the deliberations, the Chairman stated that he has taken note of the comments made by the State Govt representatives. However, conflicting positions taken by them could have been avoided. It would have helped if the State Govts. had joined the deliberations on the findings of the Committee. The issue before the Sub Group is whether environmental concerns have been addressed and whether pari-passu compliances have been carried out.

The Chairman, thereafter, thanked Dr. Devender Pandey and the Committee Members for the presentation and valuable inputs given by them.

**Item No.XLVII-3(219): – REVIEW OF THE STATUS OF IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES FOR SARDAR SAROVAR AND INDIRA SAGAR PROJECTS**

The Executive Member, NCA presented the status of implementation of Environment Safeguard Measures, as brought out in the agenda on the basis of information available in the NCA Secretariat and reports received from the party States.

The Managing Director, SSNNL stated that Gujarat has complied with all the conditions stipulated in the clearance of Sardar Sarovar project. A compliance report will be submitted soon by GoG.

The Vice Chairman stated that a similar compliance report will be submitted by GoMP also. He requested the Chairman to consider the pari-passu compliance by the State Govts.

The Chief Conservator of Forests, Dhule, representing Govt. of Maharashtra stated that except for some works on Catchment Area Treatment, there has been substantial compliance on almost all stipulated Environmental Safeguard Measures and assured to submit Action Taken Report prepared by Environment Department, Govt. of Maharashtra.

The Chairman expressed that the Action Taken Reports/Compliance Reports of the State Govts. should be analysed to assess the pari-passu compliance to the conditions of environment & forest clearances. He requested the Regional Chief Conservator of Forests to analyse the Action Taken Reports/Compliance Reports of the State Govts. and present a report in the next meeting of Environment Sub Group.

As regards, the Command Area Development Plan, the Executive Member, NCA informed that during the 44<sup>th</sup> meeting of the Environment Sub Group of the NCA held on 16th July, 2007, the Command Area Development Plan submitted by Govt of Gujarat was discussed and it was decided to form a Committee of Experts to review the plans for development of the Command Area. After a series of site visits and discussions with the Project Authorities, the Committee of Experts had finalized a detailed outline for preparation of Command Area Development Plan. The matter was again reviewed by the Secretary to Govt of India, Ministry of Environment & Forests in a review meeting held on 23rd April, 2008.


The Govt. of Gujarat has, accordingly, submitted modified report on Environment Safeguard Measures Plan for Command Area Phase-I in August, 2008, which was circulated among all members of the Committee of Experts on Command Area Development. The said CAD Plan was also discussed during the meeting held on 11<sup>th</sup> September, 2009, wherein it was decided that the CAD Plan would be forwarded to the Environment Sub Group along with the comments of the Members.

Only two comments were received in NCA Secretariat. The first comment was received from MoWR, which observed that the objectives of CADWM Programme have been considered in the modified Report and as such they have no comments to offer. The second comment was received from Dr. A.K. Bhattacharya during the

meeting on 11<sup>th</sup> September, 2009 seeking certain clarifications, which was passed on to Govt of Gujarat to make available clarifications on his observations. Govt of Gujarat has submitted para-wise clarifications on the comments offered by Shri A.K. Bhattacharya.

In pursuance of the decision taken in the meeting of Committee of Experts on CAD Plan held on 11<sup>th</sup> September, 2009, Govt. of Gujarat has circulated the CAD Plan submitted by Govt of Gujarat in August, 2008, along with comments of MoWR and Dr. A.K. Bhattacharya with para-wise clarifications submitted by Govt of Gujarat amongst all Members of Environment Sub Group to facilitate finalization of the said CAD Plan by Environment Sub Group.

Shri Shekhar Singh, Expert Member stated that more time need to be given to study the CAD report. The Govt. of Gujarat representative started that the modified CAD Plan report was circulated about two months back. The implementation of environment safeguard measures in command area cannot be delayed further. *not in agenda.*

As there were no other comments on the CAD Plan, the Sub Group approved the modified CAD Plan for Phase I area of Gujarat and directed Govt. of Gujarat to submit the CAD Plan on similar lines for the remaining command area of SSP expeditiously. Govt. of Rajasthan was also directed to submit CAD Plan for the command area in Rajasthan on similar lines. 

**Item No.XLVII-4(220): RAISING OF SARDAR SAROVAR DAM BEYOND EL. 121.92m**

The Executive Member, NCA informed that the proposal of GoG, GoMP for raising of height of Sardar Sarovar dam beyond El. 121.92 m was discussed in the 80th meeting of NCA held on 12.08.08, wherein it was inter-alia decided that

*"The Narmada Control Authority decided that further construction in Sardar Sarovar Project at and beyond 121.92 m. would be carried out in two phases:-*

- (i) Construction of spillway piers to full height and overhead bridge and installation of gates (to be kept in raised position)*
- (ii) Lowering down of the gates and impounding water up to Full Reservoir Level to EL 138.68 m.*

*The Authority decided that the issue of next stage of construction would first be considered in Environment Sub-group including consultations with Grievances Redressal Authorities and thereafter the matter would be considered by the Narmada Control Authority."*

The Managing Director, SSNNL stated that this Sub Group in its 45<sup>th</sup> meeting had already recommended for raising of spillway piers and bridge. However, in the 46<sup>th</sup> meeting, the then Chairperson directed that the said construction should be on hold. He requested that in view of the revised afflux/backwater calculations carried out by CWC, indicating revised afflux level due to construction of piers to full height and bridge at Sardar Sarovar Dam as El. 134.15m, which is less than the afflux/backwater level of El. 134.32m considered by this Sub Group while granting permission to raise the dam to El. 121.92m, permission for construction of spillway piers to full height and overhead bridge and installation of gates (to be kept in raised position) should be given.

The Vice Chairman, NVDA endorsed the above view point of Gujarat. He further stated that there were 29 major projects, 135 medium projects and some 3000 minor projects on river Narmada in Madhya Pradesh and a view need to be taken with regard to unduly loading of a particular project with catchment treatment works. He stated that as at least 30 working months' time would be required to complete the proposed constructions works. He assured completion of the remaining works pari-passu with construction activities during the period.

Shri Shekhar Singh, Expert Member stated that leaving aside the objections of the party States to the constitution of the MoEF Committee and the issue of additional submergence, this Sub Group must ensure pari-passu compliance of implementation of environment safeguard measures. He stated that additional submergence due to raising of piers and bridge is a matter of calculation and should be left to the experts in the field. Referring to the findings of the MoEF Committee, he observed that there had been several violations and no permission for further raising should be given. He also expressed apprehensions with regard to ensuring that the gates would be kept in raised position.



The Managing Director, SSNNL reiterated that there have been no violations to the conditions of environment & forest clearance orders. He further stated that the operation of Sardar Sarovar Reservoir & Power House is done as per Sardar Sarovar Reservoir Regulation Committee of NCA and there shouldn't be any doubt about lowering of the gates without due permission from NCA.

Dr. R.K. Katti, Expert Member stated that there are no other major environmental issues in taking up further works on Sardar Sarovar Project without raising water levels. He, reiterated that implementation of the Environmental Safeguard Measures should be completed before considering raising of water level.

Dr. M.C. Sharma of ICMR stated that with regard to health aspects, the State Govts. are implementing the directions of the Sub Group and requested for early commencement of the health related studies in Rajasthan.

The Chairman stated that the issue of concern is whether we are in compliance with the conditions of environment clearance and its pari-passu compliance. With regard to additional submergence due to proposed construction, we have to rely on the Central Water Commission and this Sub Group will go by their recommendation. He stated that the CWC studies indicate that there would not be any additional submergence due to proposed construction activities. However, in the event of additional submergence, construction works would have to be immediately stopped. He further stated that Environment Sub-group is required to be satisfied with the time scheduled for implementation of Environmental Safeguard Measures which are required to be worked out. State Govts. should come up with Action Plans for the same.

The Chairman requested the Regional Chief Conservator of Forests, Ministry of Environment & Forests, Bhopal to review the Action Taken Reports/Action Plans of the State Governments. All the party States were requested to make available the Action Taken Reports/Action Plans to him expeditiously, which would be discussed in the next meeting.

**Item No.XLVII-5(221): - IMPLEMENTATION OF ORDER OF HON'BLE HIGH COURT OF MADHYA PRADESH, JABALPUR IN W.P. NO.6056/ 2009**

The Executive Member, NCA informed that the Hon'ble High Court of Madhya Pradesh, Jabalpur in its order dated 11.11.2009 in WP No. 6056/2009 has directed the Authority to ensure that the directions with regard to the planning and implementations of Environment Safeguards and Rehabilitation Measures pari-passu with the works of Indira Sagar Project & Omkareshwar Canal Projects and to submit a report once every three months to the Court. In compliance of the said judgment dated 11.11.2009, the NCA in its 82nd Meeting held on 28.01.2010 discussed the modus-operandi for implementation of the directions of Hon'ble Court's judgment dated 11.11.2009. The NCA decided that Environment Sub-Group of NCA should monitor the environmental aspects and file report before the Hon'ble High Court. It was also decided by the NCA that the NCA will seek extension of the time for submission of report to Hon'ble High Court, which has been granted till 30.04.2010. He, therefore, requested the Govt. of Madhya Pradesh to make available the compliance report on the directions of the Hon'ble High Court immediately to the NCA Secretariat so that a report could be submitted before the Hon'ble High Court before the due date, i.e., 30.04.2010.

The Vice Chairman, NVDA assured to forward the compliance report in time.

**Item No.XLVII-6(222): COST SHARING OF ESTABLISHMENT OF KATHIWADA  
WILD LIFE SANCTUARY**

**Item No.XLVII-7(223): STRENGTHENING OF ENVIRONMENT WING IN NCA**

These two items could not be taken up for deliberations due to paucity of time.

## **CONCLUDING REMARKS OF THE CHAIRMAN**

The Chairman summed up the discussions by stating that there are three major issues, namely;

- (i) Progress of *pari-passu* implementation of environment safeguard measures, which is of paramount concern of this Group and cannot be compromised. Therefore, there is a need to analyse the status of implementation of environment safeguard measures vis-à-vis proposed construction.
- (ii) Assurance that there wouldn't be any additional submergence due to proposed construction. Central Water Commission should assure ESG in unambiguous terms that there wouldn't be any additional submergence due to proposed construction than what was considered when permission was granted for raising the dam to El. 121.92m. However, in the event of additional submergence, construction works would have to be immediately stopped.
- (iii) Action Plan with time schedule for implementation of balance Environmental Safeguard Measures, which are required to be worked out by the State Govts. and their assurances that these Action Plans would be adhered to

The Chairman requested the Regional Chief Conservator of Forests, Ministry of Environment & Forests, Bhopal to review the Action Taken Reports/Action Plans of the State Governments. All the party States were requested to make available the Action Taken Reports/Action Plans to him expeditiously, which would be discussed in the next meeting.

## **DATE AND TIME OF THE NEXT MEETING**

It was decided to convene next meeting of the Environment Sub-group on 1st April 2010 at 15.00 hrs. in the Committee Room No. 403, Ministry of Environment & Forest, CGO Complex, Lodhi Road, New Delhi with an agenda to review the *pari-passu* implementation of environment safeguard measures and to consider the proposal for construction of spillway piers to full height, bridge and installation of gates (to be kept in raised position) of Sardar Sarovar Dam.

The meeting ended with a vote of thanks to the Chair.

# ***ANNEXURES***

**ANNEX-XLVII-Min-(1)****LIST OF PARTICIPANTS TO THE 47<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 26<sup>th</sup> MARCH, 2010 IN NEW DELHI****Ministry of Environment & Forests, New Delhi**

1. Shri Vijai Sharma , Secretary, MOEF, New Delhi
2. Shri J. Mauskar, Addl. Secretary, MoEF
3. Dr. Nalini Bhat, Advisor (IA), MoEF
4. Shri A.K. Rana, CCF, Regional MoEF, Bhopal

**Narmada Control Authority**

1. Shri V.K. Jyothi, Executive Member, NCA, Indore
2. Shri M.K. Sinha, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore

**Ministry of Water Resources, New Delhi.**

1. Shri A.B. Pandya, Commissioner (Project), MoWR, New Delhi.

**Sardar Sarovar Construction Advisory Committee**

1. Shri N.K. Bhandari, Secretary, SSCAC, Vadodara

**Anthropological Survey of India, New Delhi.**

1. Shri S.N.H. Rizvi , New Delhi.

**Indian Council of Agriculture Research, New Delhi**

1. Dr. N.P.S. Sirohi, New Delhi.

**Indian Council of Medical Research**

1. Shri M.C. Sharma, New Delhi.

**Botanical Survey of India**

1. Dr. K.K. Khanna , Addl. Director, B.S.I., Allahabad.

**Expert Members**

1. Dr. Shekhar Singh, Expert Member, New Delhi
2. Prof. R.K Katti, Expert Member, Mumbai.

**GOVERNMENT OF GUJARAT**

1. Shri S. Jagdeeshan, M.D., SSNNL, Gandhinagar.
2. Shri P.M. Shah, Chief Engineer, SSNNL.
3. Dr. S.D. Vora, Conservator of Forests, SSNNL, G'Nagar.

**GOVERNMENT OF MADHYA PRADESH**

1. Shri O.P. Rawat, Vice Chairman, N.V.D.A., Bhopal.
2. Dr. A.A. Ansari, Member (E&R), NVDA, Bhopal
3. Shri L.K. Sood, C.C.F., NVDA, Bhopal
4. Dr. V.B. Bhatt, SM., N.H.D.C., Bhopal.

**GOVERNMENT OF MAHARASHTRA**

1. Shri R.R. Sahay, Chief Conservator of Forests (T), Dhule, GoM.



# Sardar Sarovar Narmada Nigam Ltd.

(A Govt. Of Gujarat Undertaking)

**S. Jagadeesan, I.A.S.**  
**Managing Director**

No : SSNNL/ 47th ESG/ Camp Delhi /1

26th March 2010

To,  
✓ The Chairman,  
Environment Sub Group of N C A ,  
Narmada Control Authority,  
Indore

Sub : 47 the Meeting of Environment Sub Group of N C A .....regarding presentation by the Pandey Committee

Sir,

The 47th meeting of ESG was convened to day. Hon Chairman, ESG has requested Mr Devendra Pandey and other committee ~~me~~ members to make the presentation before the ESG about the findings of the Pandey Committee appointed by M O E F.

During the meeting, besides Gujarat and M P , independent member Dr Kutty , also, expressed reservation about such presentation by an independent committee before ESG .

As such, we have not participated , in any manner, to such presentation by the Pandey Committee which was permitted to make such presentation before ESG by Hon. Chairman of ESG.

We reiterate that introduction of such external committee in the E S G tantamount to trespassing of the authority of the N C A besides violation of the judgment of the Hon Supreme Court of India , in case of Sardar Sarovar Project, in W P ( C ) 319 of 1994.

Thanking you,

Yours sincerely,

( S Jagadeesan)

# **NARMADA CONTROL AUTHORITY**

*Environment Sub Group*

*48<sup>th</sup> meeting*

*1 April 2010*

*Agenda*





Telefax 011-2553344  
E-Mail [mem@nca.org.in](mailto:mem@nca.org.in)

# नर्मदा नियंत्रण प्राधिकरण

## NARMADA CONTROL AUTHORITY

Camp: (10<sup>th</sup> Floor),  
1001, Bhikaji Cama Bhawan,  
Bhikaji Cama Place,

No. Env-3(48)/2010/108-143

Dated 26<sup>th</sup> March, 2010

To

All Members/Invitees of the Environment Sub Group of NCA  
(As per list enclosed)

**Subject: 48<sup>th</sup> meeting of Environment Sub Group scheduled on 1<sup>st</sup> April, 2010**

Sir/Madam,

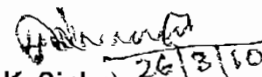
The 48<sup>th</sup> meeting of the Environment Sub Group of Narmada Control Authority has been scheduled to be held on 1<sup>st</sup> April, 2010 at 15:00 hrs. in the Committee Room No. 403, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi – 110003.

The agenda shall be to review the *pari-passu* implementation of Environment Safeguard Measures and for consideration of proposal for construction of Spillway piers to full height. bridge and installation of gates (to be kept in raised position) of Sardar Sarovar Dam.

You are requested to kindly make it convenient to attend the same.

Thanking you,

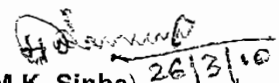
Yours faithfully,

  
(M.K. Sinha) 26/3/10

Member (E&R), NCA &  
Member Secretary, ESG

Copy for information and necessary action to:

1. The Secretary to Govt. of India, Ministry of Water Resources & Chairman, NCA Shram Shakti Bhawan, Rafi Marg, New Delhi
2. The Chief Secretary, Govt. of Gujarat, Secretariat, Gandhinagar.
3. The Chief Secretary, Govt. of Madhya Pradesh, Ballabh Bhawan, Bhopal.
4. The Chief Secretary, Govt. of Maharashtra, Mantralaya, Mumbai.
5. The Chief Secretary, Govt. of Rajasthan, Secretariat, Jaipur.

  
(M.K. Sinha) 26/3/10  
Member (E&R), NCA &  
Member Secretary, ESG

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नर्मदा नियंत्रण प्राधिकरण

**NARMADA CONTROL AUTHORITY**

1 अप्रैल 2010 को नई दिल्ली में संपन्न  
नर्मदा नियंत्रण प्राधिकरण की पर्यावरण उपदल की  
अड़तालिसवीं बैठक का कार्यवृत्त

**MINUTES OF THE 48<sup>th</sup> MEETING  
OF ENVIRONMENT SUB-GROUP OF  
NARMADA CONTROL AUTHORITY  
HELD AT NEW DELHI ON 1<sup>st</sup> APRIL 2010**

इन्दौर  
अप्रैल, 2010

Indore  
April 2010



**नर्मदा नियंत्रण प्राधिकरण**  
**NARMADA CONTROL AUTHORITY**  
 (Ministry of Water Resources, Govt. of India)



No. NCA/M(E&R)/48 ESG/2010/ 1126 - 1161

Date : 21 April, 2010

To:

All the Members/Invitees of Environment Sub Group of  
 Narmada Control Authority  
 (As per list attached)

**Sub : Minutes of 48<sup>th</sup> Meeting of Environment Sub Group of Narmada Control Authority**

Sir/Madam,

Please find enclosed herewith a copy of the minutes of the 48<sup>th</sup> meeting of Environment Sub Group of Narmada Control Authority held on 1<sup>st</sup> April, 2010 at New Delhi.

Your comments/observations on the above minutes, if any, may kindly be sent to this office within twenty one days from the date of issue of the minutes.

Yours faithfully,

( M. K. Sinha )  
 Member (E&R), NCA &  
 Member Secretary, ESG.

Encl: as above

Narmada Sadan.  
 Sector B, Scheme No. 74,  
 Vijay Nagar, Indore-452 010 (M.P.)

नर्मदा सदन, सेक्टर बी, स्कीम नं. 74,  
 विजय नगर, इन्दौर - 452 010 (म.प्र.)

स्वच्छ सुरक्षित जल - सुन्दर खुशहाल कल  
**CONSERVE WATER - SAVE LIFE**

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 Member (Power) Telefax : 0731-2551144  
 Member (Env. & Reh.) Telefax : 0731-2554333  
 Secretary : 0731-2554477 Fax : 0731-2553469  
 Web Site : nca.gov.in  
 E-mail : exe.mem.nca@nic.in

**MINUTES OF THE 48<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF  
THE NARMADA CONTROL AUTHORITY HELD ON 1<sup>ST</sup> April, 2010  
AT PARYAVARAN BHAWAN, CGO COMPLEX, NEW DELHI**

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The 48<sup>th</sup> meeting of Environment Sub-Group (ESG) of the Narmada Control Authority (NCA) was held on 1<sup>st</sup> April, 2010 at Paryavaran Bhawan, CGO Complex, New Delhi under the Chairpersonship of Shri Vijai Sharma, Secretary, Ministry of Environment & Forests (MoEF), Govt of India.

List of participants is enclosed at Annexure-XLVII-Min-(1).

The Chairman, at the outset, welcomed all participants to the meeting. He recalled that during the last meeting the Environment Sub Group had reviewed the *pari-passu* implementation of environment safeguard measures, which is of paramount concern of this Group and cannot be compromised.

It was informed that the proposed construction of spillway piers to full height, bridge and installation of gates (to be kept in raised position) of Sardar Sarovar Dam would take about 30 working months (excluding monsoon months) and that there wouldn't be any additional submergence due to proposed construction. Central Water Commission should assure us in unambiguous terms that there wouldn't be any additional submergence due to proposed construction than what was considered when permission was granted for raising the dam to El. 121.92 m.

All the party States were requested to make available the Action Taken Reports/Action Plans for addressing the gaps in the implementation of Environmental Safeguard Measures to the Regional Chief Conservator of Forests, Ministry of Environment & Forests, Bhopal, which had been done. Therefore, it would be appropriate if Narmada Control Authority could present the status of implementation of safeguard measures, and thereafter, the Regional Chief Conservator of Forest, MoEF, Bhopal could present the shortfalls in the implementation of Environmental Safeguard Measures and Action Plans for implementation of gaps in Environmental Safeguard Measures. Thereafter, this Sub Group may deliberate on the Action Plans for completing these shortfalls during next three years or so.

The Chairman, thereafter, requested the Narmada Control Authority to present the status of implementation of environment safeguard measures.

**Item No.XLVIII-1(224): REVIEW OF THE PARI-PASSU IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES AND TO CONSIDER THE PROPOSAL FOR CONSTRUCTION OF SPILLWAY PIERS TO FULL HEIGHT, BRIDGE AND INSTALLATION OF GATES (TO BE KEPT IN RAISED POSITION) OF SARDAR SAROVAR DAM.**

Member (E&R), NCA presented the status of the implementation of environment safeguard measures for Sardar Sarovar Project. He stated that the Ministry of Environment & Forests had granted conditional environmental clearance in 1987 to Sardar Sarovar Project (SSP), Gujarat. He stated that last permission to raise the dam height to El. 121.92m was granted in 41<sup>st</sup> meeting of ESG held on 06.01.2005 considering the afflux level of El. 134.32 m. The proposed construction of spillway piers to full height, bridge and installation of gates (to be kept in raised position) of Sardar Sarovar Dam wouldn't cause any additional submergence as the recent studies carried out in CWC has indicated an afflux level of El. 134.15m, which is lower than afflux level of El. 134.32m considered in 41<sup>st</sup> meeting of ESG. Moreover, it would take about 30 working months (excluding monsoon months), to complete the proposed construction which could be utilized to complete the gaps in the implementation of environment safeguard measures. He further stated that permanent submergence at El. 121.92m (since gates would remain in raised position) would be 17304 Ha (47% of submergence at FRL of 37030 Ha). The temporary submergence considering flood of magnitude of 1 in 100 years' return period, would be 27800 Ha (75% of submergence at FRL of 37030 Ha).

He informed that catchment area treatment for Phase I (directly draining) has been fully completed. However, treatment in Phase II (indirectly draining) is lagging behind. While Gujarat has completed phase II CAT works, Maharashtra is yet to treat about 21000 Ha, for which they have prepared DPRs. Madhya Pradesh has completed only 54227 Ha out of 318118 Ha under Phase II and they have submitted an action plan to complete the balance in 6 years' time. Compensatory Afforestation has been fully completed and afforested areas have been handed over to the Forest Department. The work of Tree/Forest Cover Assessment has been given to GEER Foundation in Gujarat and to Forest Survey Institute in Maharashtra & Madhya Pradesh. The reports of silt monitoring by CSWCR&TI in Gujarat & Maharashtra indicate lower sediment yield than the design value adopted. Environment Safeguard Measures Plan for Command Area for Phase I area in Gujarat has already been approved by the Committee of Experts (set up by the ESG in its 44<sup>th</sup> meeting) and reviewed in the last meeting of ESG. Govt. of Gujarat has been directed to prepare similar CAD Plan for Phase II area also. Similarly, Rajasthan has been directed to prepare a Environment Safeguard Measures Plan for Command Area for which they have already entrusted studies to Wild Life Institute, CAZRI and studies on health aspects are being assigned to NIMR.

As regards, flora-fauna and carrying capacity of surrounding area, Member (E&R) informed that Gujarat got the studies done by M.S. University, Vadodara. It has accordingly extended the Shoolpaneshwar Sanctuary from 102 sq.km to 608 sq.km. and implemented Biodiversity Conservation Plan. Maharashtra got the studies done by University of Pune. It has established a Buffer Zone of 2500 Ha with 25,00,000 plantations. For Madhya Pradesh, studies were carried out by Wild Life

Institute and SFRI, Jabalpur, which have recommended setting up of Kathiwada Sanctuary and 60 islands to be left undisturbed respectively. Social forestry plan had also been taken up to enhance fuel and fodder availability. 15,97,430 trees were planted at the cost of Rs. 4.41 crores.

A minimum of 600 cusecs discharge is being maintained for downstream environment flow requirement. Action Plans have been prepared and implemented as per CIFRI Studies. Stocking of the reservoir has been done by releasing 511 lakh, 13.50 lakh and 4 lakh fingerlings by Gujarat, Maharashtra and Madhya Pradesh respectively. The felling of trees had also been completed corresponding to El. 121.92m and coppice crops would also be removed before further impoundment.

Regarding health aspects, Member (E&R) informed that necessary studies had been carried out and health action plans have been prepared and are being implemented. Routine surveillance activities are being carried out regularly under IDSP or NRHM of Govt. of India. Health facilities at Dam site/ Peripheral villages have also been strengthened.

As regards, seismic monitoring, 9 seismic monitoring stations along the periphery of the reservoir have been set up. Data from these monitoring stations are being regularly collected and analysed by Institute of Seismological Research, Gandhinagar, and put up before the Dam Safety Review Panel of Sardar Sarovar Project.

Cataloging of monuments and sites considered important from religious, historical and cultural angles, have been done and rehabilitation of identified monuments have been carried out except for 3 temples in Madhya Pradesh due to local agitation. One museum at Kasrawad with 3 additional galleries had been set up and a separate building in Narmada Sanskriti Kendra is proposed.

Summarizing the presentation, the Executive Member, NCA stated that substantial implementation of environment safeguard measures has been made.

Dr. Shekhar Singh, Expert Member stated that phasing of catchment area treatment was never envisaged in the environmental clearance order and pari-passu compliance should be seen with reference to dam height instead of submergence as clearance would be given with reference to dam height. He further stated that his views on the issue had already been sent to the Secretary (E&F) and his comments on the CAD Plan in 2003 should be considered. Member (E&R) clarified that environment clearance order itself stipulated phased catchment area treatment and in earlier meetings of ESG, submergence area were considered while giving clearance for raising of dam. He, further, clarified that afflux/backwater levels corresponding to proposed construction to El. 121.92m was considered by the ESG in its 41<sup>st</sup> meeting while giving clearance for raising of the dam height to El. 121.92m. //?

The Chairman thereafter, requested the Regional Chief Conservator of Forests, MoEF, Bhopal to present his analysis on the Action Taken Reports and Action Plans submitted by the party States.

The RCCF, MoEF, Bhopal, thanked the State Govts., who have made available Action Taken Reports/Action Plans at a very short notice. On the basis of MoEF Committee Report, Action Taken Reports/Action Plans submitted by the State Govts., the shortfalls in the implementation of environment safeguard measures for Sardar Sarovar Project are summarized as below:

### **(1) Gujarat**

- (a) Environment Safeguard Measures Plan for Command Area (Phase – II) as per Guidelines finalized by Committee of Experts on CAD Plan
- (b) Completion of remaining works in Shoolpaneshwar Sanctuary
- (c) Declaration of all Compensatory Afforested Non Forest Area as Reserved/Restricted Forest
- (d) Establishment of regular monitoring and reporting and dissemination of the reports through a website
- (e) Completion of works as per Health Action Plan

### **(2) Madhya Pradesh**

- (a) Catchment Area Treatment in remaining area of 263891 Ha in Phase II (indirectly draining area) to be completed in next 6 years. The State Govt. has indicated Action Plan for CAT works as under;

		(in Ha)					
Sl. No.	Year/ CAT works	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Forest Area	3177	6354	9531	12708	15885	15885
2	Non Forest Area	10018	20035	30053	40070	50088	50087
	Total	13195	26389	39584	52778	65973	65972

Grand Total = 263891 Ha

- (b) Final declaration of Kathiwada Sanctuary
- (c) Declaration of all Compensatory Afforested Non Forest Area as Reserved/Restricted Forest
- (d) Establishment of regular monitoring, reporting and dissemination of the reports through website
- (e) Completion of works as per Health Action Plan

### **(3) Maharashtra**

- (a) Catchment Area Treatment in remaining area of 21430 Ha in Phase II (indirectly draining area) to be completed. The State govt. has reported that they have prepared DPRs.
- (b) Declaration of all Compensatory Afforested Non Forest Area as Reserved/Restricted Forest
- (c) Establishment of regular monitoring, reporting and dissemination of the reports through website
- (d) Completion of works as per Health Action Plan

#### (4) Rajasthan

- (a) Environment Safeguard Measures Plan for Command Area as per Guidelines finalized by Committee of Experts on CAD Plan.
- (b) Implementation of recommendations arising out of the ongoing studies by Wild Life Institute
- (c) Geographic reconnaissance study by NIMR/ICMR and completion of works as per Health Action Plan
- (d) Establishment of regular monitoring, reporting and dissemination of the reports through website

The Vice Chairman, NVDA stated that Member (E&R), NCA and RCCF, MoEF, Bhopal had presented the facts on the ground and these facts should be seen in right perspectives to take a view in the matter. He assured that the State of Madhya Pradesh is committed to carry out the remaining works in a time bound manner and barring the Phase II CAT works, which would take 6 years' time due to its magnitude, all other works would be completed in next 3 years required for construction of piers, bridge and installation of gates (to be kept in raised position). He also informed that the consultation with Gram Sabha has begun for declaration of Kathiwada Sanctuary.

The Managing Director, SSNNL stated that Gujarat had faithfully implemented environment safeguard measures and assured that all remaining works, as identified by RCCF, MoEF, Bhopal, would be completed well before the 30 working months required for construction of spillway piers to full height, bridge and installation of gates (to be kept in raised position). He, further, informed that Gujarat has no objection to charging of the cost of Kathiwada Sanctuary to Unit I of the Sardar Sarovar Project.

Dr. Shekhar Singh, Expert Member stated that leaving aside the issue of additional submergence due to raising of piers and bridge, which is a matter of calculation, this Sub Group must ensure pari-passu compliance of implementation of environment safeguard measures. Referring to the opinion of the Attorney General for India obtained by Govt. of India in 2009, he stated that this Sub Group must comply with the same. The Executive Member, NCA clarified that the Attorney General for India had only opined in favour of following the procedure laid down by the Hon'ble Supreme Court, which is being done as per the decision of NCA.

Dr. B.G Varghese, Expert Member, pointed out that project has already been delayed. Considering the implications of cost over-runs and the need to ensure that the long awaited benefits from the project are not further delayed, he recommended that further work on the dam be expedited. He emphasized that the issue should be looked in a broader perspectives and the shortfalls, as identified, should be completed along with the progress in construction works.

Dr. Shekhar Singh, Expert Member stated that on the basis of past experience, he has his reservations on the completion of shortfalls by the State Govts in time. He stated that permission sought now is the last permission as after this no more construction work would be left.



The Executive Member, NCA clarified that in pursuance of the clarification given by the Hon'ble Supreme Court on its order on 18.10.2000, construction or raising of the height of the Dam refers to submergence, and therefore, permission of Env. Sub Group, R&R Sub Group (including consultation with the GRAs) would be required before further filling of the reservoir above El. 121.92m.

On the issue of additional submergence due to proposed construction, the Commissioner (PR), MoWR stated that the Central Water Commission has carried out the backwater studies after mandatory consultation with the party States and in accordance with the stipulations of NWDT Award and NCA decisions. And the CWC studies have indicated that there would not be any additional submergence due to proposed construction over and above what was considered while permission was granted for raising the dam height to EL 121.92m.

The Chairman stated that the Committee of Experts on CAD Plan constituted by this Sub Group had recommended the modified Environment Management Plan for Command Area Development Phase I, which was reviewed and found to be in order during the last meeting. Hence, Ministry of Water Resources may consider release of fund for CAD Plan for Sardar Sarovar Project. Govt of Gujarat will prepare CAD plan for phase II on similar lines.

The Chairman further stated that this Sub Group is very keen to ensure that the pari-passu compliance of environment safeguard measures is fully implemented in letter and spirit. Project Authorities have indicated that 30 working months would be required for construction of piers, bridge and installation of gates (to be kept in raised position) and the State Governments have assured that remaining environment safeguard measures would be completed during this period. Through the presentations of NCA and RCCF, MoEF, Bhopal, it could be seen that there has been progress in the work on environmental matters. There are also certain gaps, which need to be addressed before further steps could be taken.

The Chairman, thereafter, concluded the deliberations as under;

- (i) The Environment Sub Group would need a clear written assurance from the Central Water Commission that there would be no additional submergence due to proposed construction over and above what was considered while granting permission for raising the dam height to present level of El. 121.92m. In the event of any additional submergence the further construction work would be stopped forthwith.
- (ii) The State Governments should submit immediately the Action Plans, including phased catchment area treatment, to complete the shortfalls, as identified by RCCF, MoEF, Bhopal, in the next three month and the funds required for the implementation of various measures should be ensured.
- (iii) At this crucial stage of the Project, a closer monitoring by Narmada Control Authority would be necessary. The State Governments would submit quarterly progress reports to NCA, which would be periodically reviewed by this Sub Group.

- (iv) The Action Plan and progress made in implementation of environment safeguard measures should be in public domain immediately through the NCA Website so that the stakeholders can be apprised of the same as we proceed.

In the context of the above and the fulfillment of the conditions stated, the Environment Sub-Group concluded that the construction of spillway piers to full height, bridge and installation of gates (to be kept in raised position) could be undertaken with the understanding that the permission would be withdrawn and construction works would be stopped in the event of any additional submergence or non-compliance of the Action Plan by the State Governments.

- The Chairman, further stated that this conclusion for further work on Sardar Sarovar Project is only a step in the process of obtaining permission of the Narmada Control Authority since clearance would also be required from the Grievance Redressal Authorities and the R&R Sub Group as per the directions of the Hon'ble Supreme Court.

The meeting ended with the vote of thanks to the Chair.

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# ***ANNEXURE***

**ANNEX-XLVIII-Min-(1)****LIST OF PARTICIPANTS TO THE 48<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 1<sup>st</sup> APRIL, 2010 IN NEW DELHI****Ministry of Environment & Forests, New Delhi**

1. Shri Vijai Sharma , Secretary, MOEF, New Delhi
2. Shri J. Mauskar, Addl. Secretary, MoEF
3. Dr. Nalini Bhat, Advisor (IA), MoEF
4. Shri A.K. Rana, CCF, Regional MoEF, Bhopal

**Narmada Control Authority**

1. Shri V.K. Jyothi, Executive Member, NCA, Indore
2. Shri M.K. Sinha, Member (E&R), NCA, Indore
3. Dr. Pawan Kumar, Director (Environment), NCA, Indore

**Ministry of Water Resources, New Delhi.**

1. Shri A.B. Pandya, Commissioner (Project), MoWR, New Delhi.
2. Shri S.C. Gupta, Chief Engineer, Central Water Commission, New Delhi

**Sardar Sarovar Construction Advisory Committee**

1. Shri N.K. Bhandari, Secretary, SSCAC, Vadodara

**Indian Council of Agriculture Research, New Delhi**

1. Dr. N.P.S. Sirohi, New Delhi.

**Indian Council of Medical Research**

1. Dr. B.N. Nagpal, Scientist E, NIMR, New Delhi.
2. Shri Sompal Singh, SRF, NIMR, New Delhi
3. Ms Anushrita Singh, SRF, NIMR, New Delhi

**Botanical Survey of India**

1. Dr. K.K. Khanna, Joint Director, B.S.I., Allahabad.

**Expert Members**

1. Dr. Shekhar Singh, Expert Member, New Delhi
2. Dr. B.G. Verghese, Expert Member, Mumbai.

**GOVERNMENT OF GUJARAT**

1. Shri S. Jagdeeshan, M.D., SSNNL, Gandhinagar
2. Shri K. Srinivas, Jt. Managing Director, SSNNL, Gandhinagar
3. Shri P. Khanna, PCCF, Gujarat
4. Shri P.M. Shah, General Manager (Tech), SSNNL
5. Shri P.M. Patel, Chief Engineer, SSNNL
6. Shri S.D. Vora, Chief Conservator of Forests, SSNNL, G'Nagar.

**GOVERNMENT OF MADHYA PRADESH**

1. Shri O.P. Rawat, Vice Chairman, N.V.D.A., Bhopal.
2. Dr. A.A. Ansari, Member (E&R), NVDA, Bhopal
3. Shri L.K. Sood, C.C.F., NVDA, Bhopal
4. Shri L.K. Wagh, Advisor, NVDA, Bhopal
5. Dr. V.B. Bhatt, SM., N.H.D.C., Bhopal.

1. Narmada Control Authority  
2. Narmada Control Authority

# नर्मदा नियंत्रण प्राधिकरण NARMADA CONTROL AUTHORITY

## पर्यावरण उपदल

नर्मदा नियंत्रण प्राधिकरण का 49वां बैठक

### AGENDA FOR THE 49<sup>TH</sup> MEETING

स्थान : कावेरी सभा कक्ष, इंदिरा पर्यावरण भवन, नई दिल्ली

दिनांक : 31 अगस्त 2012

Date : 31st August, 2012

समय : सुबह 10:00 बजे

महत्त्व : 10:00 बजे

विषय : नर्मदा पर्यावरण प्रभाव मूल्यांकन

विषय : नर्मदा पर्यावरण प्रभाव मूल्यांकन



केवल सरकारी प्रयोग के लिए  
For Official Use Only

# नर्मदा नियंत्रण प्राधिकरण NARMADA CONTROL AUTHORITY

## पर्यावरण उपदल Environment Sub-Group

### उनचासवीं बैठक की कार्यसूची AGENDA FOR THE 49<sup>TH</sup> MEETING

स्थान : कावेरी सभा कक्ष, इंदिरा पर्यावरण भवन, नई दिल्ली

दिनांक : 31 अगस्त 2016

Date : 31st August, 2016

Venue : Cauvery Conference Room,  
Indira Paryavaran Bhavan, New Delhi

समय : 11.00 बजे

Time : 11:00 hrs.

इन्दौर,  
अगस्त, 2016

INDORE  
August 2016

# MEMBER (Environment & Rehabilitation)'s OFFICE

## NARMADA CONTROL AUTHORITY

(Government of India, Ministry of Water Resources, River Development and Ganga Rejuvenation)

Narmada Sadan, BG Sector, Scheme No.74, Vijay Nagar, Indore - 452010, M. P., India.

Tel & Fax : + 91-731-2558603 Mobile : 9425057646, Email : afrozaahmad@hotmail.com

No. NCA/Env./49<sup>th</sup>/2016/2684-2722

By Speed Post  
16<sup>th</sup> August, 2016

सेवा में

19

पर्यावरण उपदल, नर्मदा नियंत्रण प्राधिकरण  
के सभी सदस्य एवं आमंत्रित गण  
(संलग्न सूची के अनुसार)

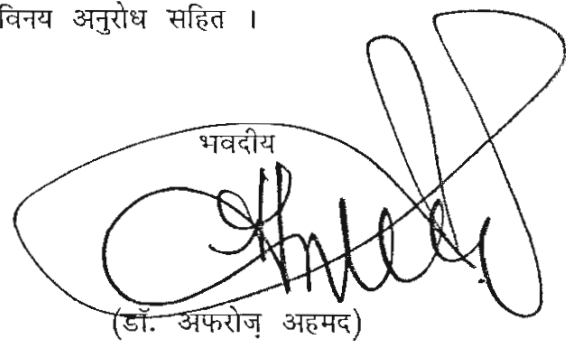
विषय : पर्यावरण उपदल, नर्मदा नियंत्रण प्राधिकरण की 49वीं बैठक के संबंध में ।

महोदय/महोदया,

इस कार्यालय के पत्र संख्या NCA/Env./49<sup>th</sup>/2016/756, दिनांक 2 अगस्त, 2016 के निरंतरता में पर्यावरण उपदल, नर्मदा नियंत्रण प्राधिकरण की 49वीं बैठक 31 अगस्त, 2016 (बुधवार) को 11:00 बजे पूर्वाह्न को कावेरी सभा कक्ष, चौथी मंजिल, इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली में आयोजित होने वाली बैठक की कार्यसूची संलग्न है ।

आपसे उपरोक्त बैठक में भाग लेने के सविनय अनुरोध सहित ।

संलग्नक : उपरोक्तानुसार ।

भवदीय  


(डॉ. अफरोज अहमद)

सदस्य (पर्यावरण एवं पुर्नवास) एवं

सदस्य सचिव - पर्यावरण उपदल

दूरभाष : 2558603/2554333

प्रतिलिपि शुभकामनाओं सहित सूचनार्थ प्रेषित :

1. श्री शशि शेखर, अध्यक्ष, नर्मदा नियंत्रण प्राधिकरण एवं सचिव, जल संसाधन, नदी विकास एवं गंगा संरक्षण मंत्रालय, श्रम शक्ति भवन, रफी मार्ग नई दिल्ली - 110 001 ।
2. श्री जे. एन. सिंह, मुख्य सचिव, गुजरात सरकार, सरदार भवन, ब्लॉक क्रमांक 1, 3री मंजिल, सचिवालय, गांधीनगर, गुजरात ।
3. श्री स्वाधिन क्षत्रिय, मुख्य सचिव, महाराष्ट्र सरकार, मंत्रालय, मुम्बई-400 032, महाराष्ट्र ।
4. श्री अंटेनी जे.सी. डिसा, मुख्य सचिव, मध्य प्रदेश सरकार, वल्लभ भवन, भोपाल, मध्य प्रदेश ।
5. श्री ओम प्रकाश मीना, मुख्य सचिव, राजस्थान सरकार, सचिवालय, जयपूर, राजस्थान ।

**MEMBER (Environment & Rehabilitation)'s OFFICE**  
**NARMADA CONTROL AUTHORITY**  
(Government of India, Ministry of Water Resources, River Development and Ganga Rejuvenation)  
Narmada Sadan, BG Sector, Scheme No.74, Vijay Nagar, Indore - 452010, M. P., India.  
Tel & Fax : + 91-731-2558603 Mobile : 9425057646, Email : afrozaahmad@hotmail.com

---

No. NCA/Env./49<sup>th</sup> /2016/

By Speed Post  
16<sup>th</sup> August, 2016

To :

All the Members/Invitees  
of Environment Sub-Group of NCA  
(As per list enclosed)

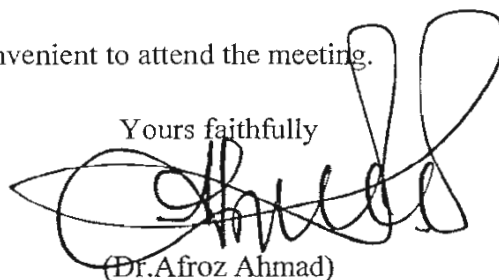
Sub: 49<sup>th</sup> Meeting of the Environment Sub-Group of NCA.

Sir/Madam,

In continuation to this office letter no. NCA/Env./49<sup>th</sup> /2016/756, dated 2<sup>nd</sup> August, 2016, please find enclosed herewith the Agenda of the 49<sup>th</sup> Meeting of the Environment Sub-group of Narmada Control Authority scheduled to be held on 31<sup>st</sup> August, 2016 (Wednesday) at 11:00 hrs. in Cauvery Conference Room, 4<sup>th</sup> Floor, Prithvi, Indira Paryavaran Bhavan, Jor Bagh Road, New Delhi-110 003.

You are requested to kindly make it convenient to attend the meeting.

Yours faithfully



(Dr. Afroz Ahmad)

Encl : As above.

Member (Environment & Rehabilitation) and  
Member Secretary-Environment Sub-Group  
Tel.(0731) 2558603/2554333

Copy with compliments for kind information to :

1. Shri Shashi Shekhar, Chairman, NCA and Secretary to the Govt. of India, Ministry of Water Resources, Shram Shakti Bhawan, Rafi Marg, NEW DELHI-1.
2. Shri J.N.Singh, Chief Secretary, Government of Gujarat, Sardar Bhawan, Block No.1, 3<sup>rd</sup> Floor, Sachivalaya, GANDHINAGAR, Gujarat.
3. Shri Swadhin Kshatriya, Chief Secretary, Government of Maharashtra, Mantralala, MUMBAI.
4. Shri Anthony JC DeSa, Chief Secretary, Government of Madhya Pradesh, Vallabh Bhawan, BHOPAL.
5. Shri Om Prakash Meena, Chief Secretary, Government of Rajasthan, Secretariat, JAIPUR.



# **LIST OF MEMBERS OF THE ENVIRONMENT SUB-GROUP OF NCA**

1. Shri Ajay Narayan Jha, Secretary to the Govt. of India, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003  
- **Chairman**
2. Shri Rajneesh Vaish, Vice-Chairman, Narmada Valley Development Authority, Narmada Bhawan, 59, Arera Hills, Bhopal, Madhya Pradesh.
3. Shri S.S.Rathore, Managing Director, SSNNL, Govt. of Gujarat, 1<sup>st</sup> Floor, Block No.12, New Sachivalaya, Gandhinagar-382010 (Gujarat).
4. Shri Satish M. Gavai, Principal Secretary (Environment), Government of Maharashtra, Environment Department, 217 Annex, Opp. Mantralaya, 2<sup>nd</sup> Floor, Mumbai – 400 032, Maharashtra.
5. Shri Narendra Kumar, Member (RM), CWC & Executive Member (Addl. Charge), Narmada Control Authority, Indore, Madhya Pradesh.
6. Secretary (Environment), Government of Rajasthan, Environment Department, Sachivalaya, Jaipur – 302 005, Rajasthan.
7. Shri K.Vohra, Commissioner (SPR), Government of India, Ministry of Water Resources, River Development and Ganga Rejuvenation, Shram Shakti Bhawan, Rafi Marg, New Delhi – 110 001.
8. Director, Anthropological Survey of India, Anthropological Survey of India, 27 Jawaharlal Nehru Road, Kolkata – 700 016, West Bengal.
9. Secretary (Department of Health Research) and Director General, Indian Council of Medical Research, Ansari Nagar, Post Box No. 4911, New Delhi – 110 029.
10. Director General, Archaeological Survey of India, 11, Janpath, New Delhi – 110 001.
11. Deputy Director General, Soil Agronomy and Engineering, ICAR, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
12. Dr. V. B. Mathur, Director Wildlife Institute of India, Post Box No. 18, Chandrabani, Dehradun 248 001, Uttarakhand.
13. Dr.P.P.Majumdar, Professor & Chairman, Department of Civil Engineering, Indian Institute of Science, Bangalore, Karnataka.
14. Dr. (Mrs.) Uma Melkania, Professor & Head, Department of Environmental Science, G.B.Pant University of Agriculture and Technology, Pantnagar, Uttaranchal.
- ✓ 15. Dr. Shekhar Singh, Director, Samya-Centre for Equity Studies, C-17A, DDA Flats, New Delhi – 110 067.
16. Deputy Inspector General, Forest, Government of India, Ministry of Environment & Forests, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi.
17. Dr. Afroz Ahmad, Member (Environment & Rehabilitation), NCA, Narmada Sadan, Sector B, Scheme No. 74, Vijay Nagar, Indore -452 010, Madhya Pradesh.  
- **Member Secretary**

**LIST OF INVITEES OF THE  
ENVIRONMENT SUB-GROUP OF NCA**

1. Principal Secretary (Forests), Revenue and Forests Department, Government of Maharashtra, Mantralaya, Mumbai – 400 032, Maharashtra.
2. Shri Gyanesh Bharti, Joint Secretary, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003
3. Shri C.P.Rai, Member (Environment and Forests), Narmada Valley Development Authority, Narmada Bhavan, 59 Arera Hills, Jail Road, Bhopal – 462 011, Madhya Pradesh.
4. Additional Secretary (Environment), Environment Department, Government of Rajasthan, Room No. 321-A, SSO Bhawan, Sachivalaya, Jaipur – 302 005, Rajasthan.
5. Chief Conservator of Forests, Sardar Sarovar Narmada Nigam Ltd., Block No.12, New Sachivalaya Complex, Gandhinagar – 382 010, Gujarat.
6. Director General, Health Services, 4<sup>th</sup> Floor, Government Dental College Building, St. George Hospital Compound, Mumbai – 400 001, Maharashtra.
7. Joint Secretary, Ministry of Agriculture, Government of India, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
8. Shri S.M.Upase, Secretary (CAD), Water Resources Department, Government of Maharashtra, Mantralaya, Mumbai – 400 032, Maharashtra.
9. The Commissioner, Department of Archaeology, Archives and Museum, Government of Madhya Pradesh, Bangaga Marg, T.T.Nagar, Bhopal.
10. Shri Gulshan Raj, Secretary, Sardar Sarovar Construction Advisory Committee, A-Block, 4<sup>th</sup> Floor, Narmada Bhawan, Indira Avenue, Vadodara, Gujarat.
11. Chief Conservator of Forests (Central), Ministry of Environment and Forests, Western Regional Officer, E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal – 462016, Madhya Pradesh.
12. Additional Commissioner, Government of India, Ministry of Agriculture, Krishi Bhawan, Dr.Rajendra Prasad Marg, New Delhi – 110 001.
13. Shri G.P.Sinha, Scientist E & HoD, Botanical Survey of India, Central Regional Central, 10 Chetham Lines, Allahabad – 211 002, Uttar Pradesh.
14. Director, National Institute of Communicable Diseases, 22 Shyam Nath Marg, New Delhi – 110 007.
15. Chief Executive Director, Narmada Hydroelectric Development Corporation (NHDC), Corporate Office, NHDC Square, Block No.2, 5<sup>th</sup> Floor, Paryavas Bhawan, Arera Hills, BHOPAL - 462 011, Madhya Pradesh.
16. Shri Uday Avsak, Chief Conservator of Forests Dhule, Government of Maharashtra, Jamnagiri Road, Near S.R.P. Camp, Opp. Fauzdar Quarter, Dhule-424001.
17. Joint Secretary, Department of Indian System of Medicine and Homoeopathy, IRCS Building, 1, Red Cross Road, New Delhi – 110 001.

**AGENDA FOR 49<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NARMADA CONTROL AUTHORITY (NCA)**

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XLIX - 1 (225)	CONFIRMATION OF THE MINUTES OF THE 47 <sup>TH</sup> AND 48 <sup>TH</sup> MEETINGS OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 26.03.2010 AND 01.04.2010 RESPECTIVELY.
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The minutes of the 47<sup>th</sup> and 48<sup>th</sup> Meetings of the Environment Sub-Group of the Narmada Control Authority (NCA) held at New Delhi on 26<sup>th</sup> March, 2010 and 1<sup>st</sup> April, 2010 respectively were circulated to all the Members and Invitees vide NCA's Office letters of even numbers dated 21<sup>st</sup> April, 2010.

As no comments/observations have been received from any of the Member, the same may be confirmed by the Sub-Group.

XLIX - 2 (226)	STATUS OF COMPLIANCE OF DECISIONS/ DIRECTIONS OF 48 <sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA
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The Environment Sub-Group of NCA in its 48<sup>th</sup> meeting held on 01.04.2010 reviewed the *pari-passu* implementation of Environment safeguard measures with reference to the present proposal for “construction of Spillway piers to full height, bridge and installation of gates (to be kept in raised position) of Sardar Sarovar Dam (SSD)” wherein, the Sub-Group has accorded clearance to the proposal with some conditionalities.

The status of compliance on the decisions taken and directions issued is as follows:

Sl. No.	Decisions taken and directions issued in 48 <sup>th</sup> Meeting of Environment Sub-Group of NCA.	Status of Compliance
1.	The Environment Sub Group would need a clear written assurance from the Central Water Commission (CWC) that there would be no additional submergence due to proposed construction over and above what was considered while granting permission for raising the dam height to present level of El. 121.92m. In the event of any additional submergence, the further construction work would be stopped forthwith.	<p>The NCA Secretariat vide letter dated 03.05.2010 wrote to the Chairman, CWC for the reconfirmation of the backwater studies carried out by CWC regarding the impact of proposed construction</p> <p>The CWC vide letter dated 24.05.2010 has conveyed to the NCA Secretariat that the matter has been examined in CWC and reconfirmed as follows :</p> <p><i>“The backwater study regarding impact of proposed construction of Spillway piers to its full height and bridge and installation of gates (to be kept in raised position) was carried out in CWC based on the decision taken in the 5<sup>th</sup></i></p>

		<i>Technical Meeting of the Technical Sub-Committee to review the backwater levels for SSP held on 04.08.2008 in New Delhi. Accordingly, the afflux level was worked out to be 134.15 m at Sardar Sarovar dam against 134.32 m considered while granting permission for raising the dam height to EL 121.92 m."</i>
2.	The State Governments should submit immediately the Action Plans, including phased catchment area treatment, to complete the shortfalls, as identified by RCCF. MoEF. Bhopal, in the next three month and the funds required for the implementation of various measures should be ensured.	This has been complied.
3.	At this crucial stage of the Project, a closer monitoring by Narmada Control Authority would be necessary. The State Governments would submit quarterly progress reports to NCA, which would be periodically reviewed by this Sub Group.	The monitoring is being ensured by the office of Member (E&R), NCA.  The State Governments are submitting quarterly progress report to the NCA.
4.	The Action Plan and progress made in implementation of	This has been complied.

	environment      safeguard measures should be in public domain immediately through the NCA Website so that the stakeholders can be apprised of the same as we proceed.	
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The compliance on above directions of Environment Sub-Group of NCA had already been made by the State Governments/NCA/CWC.

- **This is for information of the Sub-Group.**

XLIX - 3 (227)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)
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## 1. BACKGROUND

- 1.1. The Authority for granting final permission for raising height of the Sardar Sarovar Dam (SSD) is the Narmada Control Authority (NCA). This mandate was given by Hon'ble Supreme Court by its judgement dated 18.10.2000 in Writ petition No. 319 of 1994.

According to the above judgment of Hon'ble Supreme Court, the NCA will permit raising dam height after obtaining clearances from Environment and R&R Sub-Groups of the NCA. The R&R Sub-Group of NCA will accord clearance after consultations with the Grievances Redressal Authorities (GRAs) of the States.

- 1.2. The Government of Gujarat vide letter dated 02.08.2008 has submitted the proposal to the NCA to consider granting the permission for the construction of piers and overhead bridge and installation of gates (to be kept in raised position). The proposal of Government of Gujarat was deliberated in the 80th Meeting of the NCA held on 12.08.2008 wherein, the Authority decided that further construction of SSD would be carried out in two phases:

Phase – I. Construction of spillway piers to its full height and bridge and installation of gates (to be kept in raised position), and

Phase – II. Lowering down of the gates and impounding water in the reservoir to full reservoir level to EL 138.68m.

The Authority decided that the issue of the next stage of construction i.e. Phase-I would first be considered in Environment Sub-Group and R&R Sub-Group including consultation with Grievances Redressal Authorities (GRAs) and thereafter the matter would be considered by the NCA

- 1.3. The Phase-I proposal was discussed in 86<sup>th</sup> meeting of Narmada Control Authority(NCA) held on 12.06.2014 wherein, the Authority, on the basis of clearances by Environment Sub-Group (ESG) and Resettlement &



Rehabilitation ( R&R) Sub-group of NCA accorded its permission for Phase-I proposal.

## 2. STATUS OF *PARI-PASSU* IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO PHASE-II PROPOSAL.

The Environment Safeguard Measures related to the Sardar Sarovar Project (SSP) implemented/under implementation are mainly in Gujarat, Maharashtra and Madhya Pradesh. In Rajasthan, it is limited to only Command Area in Barmer and Jalore districts in Rajasthan.

The status of implementation of Environmental Safeguard Measures in the States are being reviewed regularly by the Chairman and Member Secretary of the Environment Sub-Group of NCA. Accordingly, Member (Environment and Rehabilitation), NCA vide letter dated 30.11.2015 solicited detailed information about progress of implementation of Environmental Safeguard Measures in the State of Gujarat, Maharashtra and Madhya Pradesh related to Phase-II proposal "Lowering down of the gates and impounding water in the reservoir to full reservoir level to EL 138.68m.". Further, the Member (E&R), NCA reviewed the progress with the concerned officers of Government of Gujarat on 21.01.2016 and 29.02.2016 in Gandhinagar and also undertaken field visits to Command Area and Compensatory Afforestation area, in Katchch during 2-4 May, 2016.

In Rajasthan, Member (E&R), NCA has undertaken field visit during 28-29 October, 2015 in the Command Areas of Narmada Main Canal in Sanchores Tehsil, held public meeting in Village Kailashnagar with the Chairman, Water Users Association wherein farmers from other villages of the Narmada Command participated.

In Maharashtra, the programmes of implementation of Environmental Safeguard Measures was reviewed by Member (E&R), NCA with the officials of Government of Maharashtra on 30.04.2016 and 27.05.2016. The Member (E&R), NCA has also undertaken field visit to Compensatory Afforestation areas in Aurangabad district during July 22-23, 2016.

Accordingly, the Governments of Gujarat vide letter dated 31.05.2016, Madhya Pradesh vide letter dated 30.06.2016 and Maharashtra during the review meeting on 27.05.2016 taken by Member (E&R), NCA with the officials of Government of Maharashtra have furnished the latest status report related to the implementation of Environmental Safeguard Measures concerning Phase-II.

The status of Environmental Safeguard Measures based on information furnished by the States related to Phase-II of Sardar Sarovar Project (SSP) are presented as below :

## 2.1. CATCHMENT AREA TREATMENT (CAT)

The CAT works have been divided in two phases i.e. Phase-I (directly draining very high and high degraded area) and Phase-II (freely draining very high and high degraded area).

The CAT works for the Phase-I areas were completed in Gujarat, Madhya Pradesh and Maharashtra. With regard to CAT works in Phase-II areas, the progress was 78.35% in Madhya Pradesh, 78% in Maharashtra whereas for the areas in Gujarat progress was 100%. The overall progress for the Phase-II areas was 85.45% for the project as a whole. The details of CAT works of SSP is as below :

(Areas in Ha)					
Sl. No.	Description	M.P.	Gujarat	Maharashtra	Total
1.	Catchment below Indira Sagar Project	2248600	30230	163611	2442441
2.	Very High and High degraded area as identified by All India Soil and Land Use Survey Organisation**	433740	30230	100993	564963
3.	Phase I area: Directly draining Very High and High degraded area	115622	29730	24298	169650
4.	Phase I area: Target (after deducting untreatable area on account of being rocky/steep slope, etc.)*	110997	29157	23295	163449
5.	Phase I area: Achievement	110997	29157	23295	163449
6.	Phase I area: Achievement in %	100%	100%	100%	100%
7.	Phase II area: Freely draining Very High and High degraded area	318118	500	77568	396186
8.	Phase II area: Target (after deducting untreatable area on account of being rocky/steep slope, etc.)*	262165	500	43125	305790
9.	Phase II area: Achievement	205419	500	33578	207081
10.	Phase II area: Achievement in %	78.35%	100%	78%	85.45%

\* Balance area is untreatable. \*\* All India Soil and Land Use Survey Organization.

The balance CAT works related to Phase-II is 56746 ha. in Madhya Pradesh and 9547 ha. in Maharashtra.

The Governments of Maharashtra and Madhya Pradesh may inform the status of Action Plan and time line for completion of 9547 ha. and 56746 ha. balance CAT works respectively related to Phase-II.

## 2.2. COMPENSATORY AFFORESTATION

Approval for diversion of forest land for the SSP was granted by the Ministry of Environment and Forests (MoEF) in 1987, 1990 and in 1993 (including for R&R works) alongwith some conditions relating to the planning and implementation of Compensatory Afforestation (CA). The important conditions were as below:

1. There should be compensatory afforestation on equivalent area in non-forest land in addition to reforestation of double the area in degraded forest for every hectare of forestland submerged or diverted for construction of the project.
2. An equal area of non-forestland or double the area of degraded forest should be planted for the 4200 hectare of forest land in Maharashtra, which is to be used for R&R

### a. In lieu of 13386 ha forest area diverted for submergence

Sl. No.	State		Target (ha)	Achievement (ha)	Achievement (%)
1	Gujarat	Degraded Forest Area	9300	9300	100%
		Non Forest Area	4650	4650	100%
		Total	13950	13950	100%
2	Madhya Pradesh	Degraded Forest Area	6538	6538	100%
		Non Forest Area	2199	2199	100%
		Total	8737	8737	100%
3	Maharashtra	Degraded Forest Area	12977	12977	100%
		Non Forest Area	6489	6402*	98.6%
		Total	19466	19379	99.5%
GRAND TOTAL			42153	42066	99.7%

\* In Maharashtra, 87 ha. non-forest area is required to be brought under Compensatory Afforestation.

► The Government of Maharashtra may inform the status of Compensatory Afforestation in balance 87 ha. non-forest area.

### b. In lieu of forest area diverted for rehabilitation in Maharashtra.

Area diverted (Target) = 4200 ha  
 Achievement = 4197.5 ha (remaining area unfit for plantation)  
 Achievement (%) = 99.9%

**c. Efficacy of Plantations**

The rate of survival of the plantations and the year of reporting is as follows :

Activities	Gujarat	Maharashtra	Madhya
Survival percentage/ year of reporting	50% non-forest areas below 50 % in degraded forest land (2004).	80% of non-forest and degraded forest areas with 42% success (2007).	26% in non-forest area and 45% in forest area (2008).

- The Governments of Gujarat, Maharashtra and Madhya Pradesh may inform the latest status of rate of survival of plantation.

**d. Progress in notification of plantation on non-forest area as reserved/protected forests**

States	Area to be declared (ha)	Area under declaration	% Achievement
Gujarat (Under Section-4)	4650	4650	100%
Gujarat (Under Section-20)	4650	1640.35	35.28%
Madhya Pradesh	2059.81	1832.97	88.98%
Maharashtra	10602	9575.96	90.32%

- The State Governments may inform the following :

- In Gujarat, the status of notification of 3009.65 ha. non-forest area brought under Compensatory Afforestation as Reserved/ Protected Forests.
- In Madhya Pradesh, the status of notification of 226.83 ha. non-forest area brought under Compensatory Afforestation as Reserved/ Protected Forests.
- In Maharashtra, the status of notification of 1026.04 ha. non-forest area brought under Compensatory Afforestation as Reserved/ Protected Forests.

**2.3. COMMAND AREA DEVELOPMENT PLAN**

The Environmental Safeguard Measures plan for the Command Area in Gujarat and Rajasthan were required to be prepared. Accordingly, Government of Gujarat has prepared Plan for Phase-I and the same is under implementation. The plan for Phase-II (A-D) is now required to be prepared. The plan prepared by Government of Rajasthan in 2004 was under revision to incorporate recommendations based on

studies carried out by various Agencies like Water and Power Consultancy Services (WAPCOS)/National Institute of Malaria Research (NIMR)/Wildlife Institute of India (WII)/Central Arid Zone Research Institute (CAZRI).

- ▶ The Government of Gujarat may inform the latest status of Environment Safeguard Measures Plan for Command Area related to Phase-II (A-D).
- ▶ The Government of Rajasthan may inform the latest status of revised Environment Safeguard Measures Plan for the Command Area in Rajasthan.

## 2.4. SURVEY OF FLORA, FAUNA AND CARRYING CAPACITY OF SURROUNDING AREAS

### 2.4.1. Terrestrial Environment :

Key Issues/Target	Achievement		
	Gujarat	Maharashtra	Madhya Pradesh
Survey of flora – fauna & assessment of carrying capacity	M.S. University, Vadodara, Report of 1992 on submergence and other impact areas.	Deptt. of Environmental Sciences, University of Pune Report of 1994 for SSP areas in Maharashtra	SFRI, Jabalpur Report of 1993 and WLL Report of 2008 for SSP areas in Madhya Pradesh
Preparation and execution of plans as per recommendations of EIA Studies.	Identified plant species are being preserved at MS University's Botanical garden. e-herbarium have also been established in the University and the same was placed in public domain on 12.03.2016. The plan for the conservation of bio-diversity in Shoolpaneshwar sanctuary areas is also under implementation.	Buffer zone plantations covering 2500 ha is completed	Social forestry plan had been taken up to enhance fuel and fodder availability. Sixty island to be formed at FRL of SSP Reservoir are to be left undisturbed.

Rehabilitation plan for the identified wildlife impacted by submergence.	The area of Shoolpaneshwar sanctuary located close to the dam was extended from 102 km <sup>2</sup> to 608 km <sup>2</sup> during 1989 to provide shelter to wildlife.	The proposal to declare Toranmal Forest as 'Conservation Reserve' is pending with the PCCF, Nagpur.	WII studies recommended sanctuary at Kathiwara forest in Alirajpur district. The GOMP could not declare due to resistance by villagers inhabiting there.  The Chairman vide letter dated July 21, 2016 desired Wildlife Institute of India (WII) to carry out a quick survey of the area and submit suitability of Kathiwara forest to be declared as 'Sanctuary' or Nature Reserve and submit its findings.
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- ▶ The Government Maharashtra may inform the latest progress about declaration of Toranmal Forest as 'Conservation Reserve'.
- ▶ The Government of Madhya Pradesh may inform the latest progress about declaration of Kathiwara Forest as 'Sanctuary'.
- ▶ Review of proposal of Sanctuary at Kathiwara Forest based on WII study.

#### **2.4.2. Aquatic Environment (Up stream of Sardar Sarovar Dam i.e. Reservoir Management) :**

The issue related to the upstream of the dam includes; reservoir management from ecology points of view and fisheries conservation and development. The Governments of Gujarat, Maharashtra and Madhya Pradesh were required to entrust studies to specialized Agencies like Central Inland capture Fisheries Research Institute (CICFRI), etc. and accordingly studies were entrusted to specialized agencies. The felling of trees in forest and non-forest area coming under the impact of submergence

have been carried out well before actual submergence. ~~The fisheries~~ development and conservation are already under implementation by the ~~concerned States~~.

- ▶ The Governments of Gujarat, Maharashtra and Madhya Pradesh may inform the latest progress about ~~fisheries~~ conservation and development in the reservoir and action taken for reservoir management in the area falling under ~~their~~ jurisdiction.

## 2.5. DOWNSTREAM ENVIRONMENT (~~CONCERNED~~ TO ONLY GUJARAT STATE)

The downstream of the dam is exclusively in the Gujarat. There are various studies carried out/ongoing for evolving an Integrated Plan for Environmental Management in the downstream. It includes;

- Mathematical Model studies for assessment of ~~water quality~~ by CWPRS (completed).
- Morphological Studies for River Narmada from SS Dam up to the Sea (awaited).
- Mathematical Model studies for Routing of ~~flow in~~ River Narmada from SS Dam up to the Sea (awaited).
- Studies on Impact on Ecological Functions ~~and Fisheries~~ Downstream of Sardar Sarovar Dam (CICFRI) completed and further report is awaited.
- Draft report of EIA of emerging Sardar Sarovar Reservoir (SSR) completed.

The Government of Gujarat is ensuring discharge of 600 cusecs for downstream from Godbole Gate for environmental flow ~~requirements~~. These flows are being monitored by Sardar Sarovar Reservoir Regulation Committee of NCA.

- ▶ The Government of Gujarat may inform the latest status of integrated plan for Environmental Management ~~in~~ downstream of the dam.

## 2.6. SEISMICITY AND RIM STABILITY

The studies of Reservoir Induced Seismicity (RIS) ~~and Rim Stability~~ have been carried out by the Geological Survey of India (GIS), ~~Central Water~~ and Power Research Station (CWPRS), University of Roorkee. ~~Accordingly,~~ the design and construction of the dam have been carried out as follows:

- Horizontal seismic design coefficient of ~~0.12 g~~ adopted on the recommendation of the Dam Review Panel.

- Stress monitors installed in the main body of the dam.
- The depth of the Foundation increased to 18 m. below the lowest point of riverbed.

As regards, Seismic monitoring, 9 seismic monitoring stations along the periphery of Sardar Sarovar Reservoir have been set up. Data from these monitoring stations are being regularly collected and analyzed by Institute of Seismic Research (ISR), Gandhinagar, and put up before the Dam Safety Review Panel of Sardar Sarovar Project.

- The Government of Gujarat may inform the latest progress on seismicity/seismic events.

## 2.7. HEALTH ASPECTS

The Health issues primarily concerns (i) Disease surveillance, (ii) regular monitoring of incidences of water borne diseases and (iii) health delivery system in the project areas both on preventive and curative fronts. The Surveillance of water borne diseases is normally being carried out under Integrated Disease Surveillance Project (IDSP) and National Rural Health Mission (NHRM) of Govt. of India.

The status of implementation of health safeguards for the Sardar Sarovar Project area is as under:-

Action	Gujarat	Maharashtra	Madhya Pradesh
EIA studies	By State Council of Health and Medical Services ( SCHMS), 1994	By T.N.Medical college Mumbai and Medical college Dhule district.	By Gandhi Medical College Bhopal and ICMR New Delhi
Action Plan	Action plan of 1986 and draft plan of 1996	Action Plan of 1987 revised in 1991, 1996 and 2007	Action Plan 1987 revised in August 2003.
Diseases monitoring in impacted areas of SSP	Through SCHMS, besides routine district wise surveillance under IDSP or NHRM of Govt. of India.	Routine surveillance under IDSP or NHRM of Govt. of India.	Dedicated surveillance studies through NIMR of ICMR besides routine surveillance under IDSP or NHRM of Govt. of India.



Establishment of health facilities at Dam site/ Peripheral villages.	progressing	progressing	progressing
Vector control measures	As per plan of 1986	As per plan of 2007	As per plan of 2003

- The Governments of Gujarat, Maharashtra and Madhya Pradesh may inform the progress about the revised action plan for Health Care.

## 2.8. ARCHAEOLOGY AND ANTHROPOLOGY

The archaeological and anthropological aspects have been addressed by Survey of the antiquities to be salvaged, documentation for the purpose of the record, relocation / excavation of the monuments / mounds, display of the retrieved cultural heritage artifacts in museums, etc.

Accordingly, the State Governments have prepared their work plans. The none of the monuments are of national importance in Sardar Sarovar Project. The current status of protection / relocation works is as under:

Contents	Gujarat	Maharashtra	Madhya Pradesh
Monuments	2 (completed)	Nil	16 completed, 4 in progress, 3 (temples) remaining due to local resistance.
Mounds	Nil	Nil	All 13 mounds upto FRL completed.
Museums/Parks	Nil	Nil	One museum at Kasrawad established. 3 additional galleries in lieu of 3 other museums found unviable. A separate building in Narmada Sanskriti Kendra proposed.

Anthropological Survey of India has decided to conduct extensive exploration in Central Narmada Valley between Jabalpur & Handia and to carry out explorations at Hathnora on the right bank of Narmada a fossilized partial skull and right collar bone of the solitary known early age man in south asia was discovered. Which was named as skull of Homo floresiensis or Hobbits. A systematic and large scale

attempts is being under taken by the Anthropological Survey of India. Detailed report was awaited.

- ▶ The Government of Madhya Pradesh may inform the latest progress about protection/relocation of 4 monuments, 3 temples and a separate building for Narmada Sanskriti Kendra.
- ▶ The Government Madhya Pradesh may inform the progress if any, about exploration at Hathnera on the right bank of Narmada by Anthropological Survey of India.

XLIX - 4 (228)	STRENGTHENING OF ENVIRONMENT AND REHABILITATION (E&R) WING FOR FIELD MONITORING
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The role of the NCA mainly comprises coordination and monitoring of engineering works, the environmental protection measures and rehabilitation programme and to ensure faithful compliance of the terms and conditions stipulated by the Central Government.

The monitoring of Environment Safeguard Measures implemented/under implementation related to the Sardar Sarovar Project (SSP) is being carried out by the Office of Member (Environment and Rehabilitation), NCA. The implementation of Environment Safeguard Measures associated with the SSP is in crucial stage.

The Environment Sub-Group of NCA in its 48<sup>th</sup> Meeting held on 01.04.2010 has observed that "At this crucial stage of the project, a close monitoring of NCA would be necessary".

Accordingly, it is proposed to appoint one Research Associate (Monitoring) on temporary basis only for 02 years period. The qualification of Research Associate would be a Ph.D. in Natural Sciences with experience in the field of Environment Management. The Research Associate will assist Member (E&R), NCA and report him directly. The appointment of Research Associate will be on Contractual Basis for the period of 02 years which will be renewed annually. The stipend of Research Associate will be Rs.36,000/- per month (1<sup>st</sup> year) and Rs.38,000/- (2<sup>nd</sup> Year). The other service conditions like HRA/ Accommodation, Medical benefits, Leave and other entitlements benefits will be paid for Research Associate will be similar to the condition of service for research personnel working in R&D programme of the Ministry of Environment, Forest and Climate Change.

- The Sub-Group may approve the proposal.

XLIX - 5 (229)

ANY OTHER ITEMS, WITH ~~THE~~ PERMISSION OF THE  
CHAIR

केवल सरकारी प्रयोग के लिए  
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# नर्मदा नियंत्रण प्राधिकरण Narmada Control Authority

## पर्यावरण उपदल Environment Sub-Group

### उनचासवीं बैठक का कार्यवृत्त MINUTES OF THE 49<sup>TH</sup> MEETING

स्थान : कावेरी सभा कक्ष, इंदिरा पर्यावरण भवन, नई दिल्ली

Vanue : Kavery Conference Room,  
Indira Paryavaran Bhavan, New Delhi

दिनांक : 31 अगस्त 2016

Date : 31st August, 2016

समय : 11.00 बजे

Time : 11:00 hrs.

इन्दौर  
अक्टूबर, 2016

Indore  
October, 2016

**MEMBER (Environment & Rehabilitation)'s OFFICE**  
**NARMADA CONTROL AUTHORITY**  
 (Government of India, Ministry of Water Resources, River Development and Ganga Rejuvenation)  
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No. NCA/Env./49<sup>th</sup>/2016/ 3489-3507

By Speed Post  
 17 अक्टूबर, 2016

सेवा में

नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल  
 के सभी सदस्य एवं आमंत्रित गण  
 (संलग्न सूची के अनुसार)

विषय : नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 49वीं बैठक का कार्यवृत्त ।

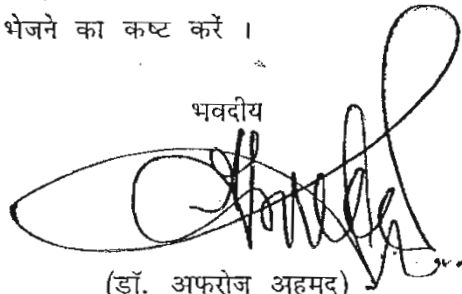
महोदय/महोदया,

नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 31 अगस्त, 2016 को नई दिल्ली में संपन्न 49वीं बैठक के कार्यवृत्त की एक प्रति भेजी जा रही है ।

आपसे अनुरोध है कि इस संबंध में अगर कोई विचार या टिप्पणी हो तो उन्हें इस पत्र की प्राप्ति के पश्चात यथाशीघ्र इस कार्यालय को भेजने का कष्ट करें ।

संलग्नक : उपरोक्तानुसार ।

भवदीय



(डॉ. अफरोज अहमद)

सदस्य (पर्यावरण एवं पुर्नवास) एवं  
 सदस्य सचिव - पर्यावरण उपदल  
 दूरभाष : 2558603/2554333

प्रतिलिपि शुभकामनाओं सहित सूचनार्थ प्रेषित :

1. श्री शशि शेखर, अध्यक्ष, नर्मदा नियंत्रण प्राधिकरण एवं सचिव, जल संसाधन, नदी विकास एवं गंगा संरक्षण मंत्रालय, श्रम शक्ति भवन, रफी मार्ग नई दिल्ली - 110 001 ।
2. श्री जे. एन. सिंह, मुख्य सचिव, गुजरात सरकार, सरदार भवन, ब्लॉक क्रमांक 1, 3री मंजिल, सचिवालय, गांधीनगर, गुजरात ।
3. श्री स्वाधिन क्षत्रिय, मुख्य सचिव, महाराष्ट्र सरकार, मंत्रालय, मुम्बई-400 032, महाराष्ट्र ।
4. श्री अंटोनी जे.सी. डिसा, मुख्य सचिव, मध्य प्रदेश सरकार, चल्लभ भवन, भोपाल, मध्य प्रदेश ।
5. श्री ओम प्रकाश मीना, मुख्य सचिव, राजस्थान सरकार, सचिवालय, जयपूर, राजस्थान ।

# **LIST OF MEMBERS OF THE ENVIRONMENT SUB-GROUP OF NCA**

1. Shri Ajay Narayan Jha, Secretary to the Govt. of India, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003  
- **Chairman**
2. Shri Rajneesh Vaish, Vice-Chairman, Narmada Valley Development Authority, Narmada Bhawan, 59, Arera Hills, Bhopal, Madhya Pradesh.
3. Shri S.S.Rathore, Managing Director, SSNNL, Govt. of Gujarat, 1<sup>st</sup> Floor, Block No.12, New Sachivalaya, Gandhinagar-382010 (Gujarat).
4. Shri Satish M. Gavai, Principal Secretary (Environment), Government of Maharashtra, Environment Department, 217 Annex, Opp. Mantralaya, 2<sup>nd</sup> Floor, Mumbai – 400 032, Maharashtra.
5. Shri Narendra Kumar, Member (RM), CWC & Executive Member (Addl. Charge), Narmada Control Authority, Indore, Madhya Pradesh.
6. Shri R.K.Grover, Secretary (Environment), Government of Rajasthan, Environment Department, Sachivalaya, Jaipur – 302 005, Rajasthan.
7. Shri K.Vohra, Commissioner (SPR), Government of India, Ministry of Water Resources, River Development and Ganga Rejuvenation, Shram Shakti Bhawan, Rafi Marg, New Delhi – 110 001.
8. Director, Anthropological Survey of India, Anthropological Survey of India, 27 Jawaharlal Nehru Road, Kolkata – 700 016, West Bengal.
9. Dr.Soumya Swaminathan, Secretary (Department of Health Research) and Director General, Indian Council of Medical Research, V.Ramalingaswami Bhawan, Ansari Nagar, Post Box No. 4911, New Delhi – 110 029.
10. Director General, Archaeological Survey of India, 11, Janpath, New Delhi – 110 001.
11. Deputy Director General, Soil Agronomy and Engineering, ICAR, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
12. Dr. V. B. Mathur, Director Wildlife Institute of India, Post Box No. 18, Chandrabani, Dehradun 248 001, Uttarakhand.
13. Dr.P.P.Majumdar, Professor & Chairman, Department of Civil Engineering, Indian Institute of Science, Bangalore, Karnataka.
14. Dr. (Mrs.) Uma Melkania, Professor & Head, Department of Environmental Science, G.B.Pant University of Agriculture and Technology, Pantnagar, Uttaranchal.
15. Dr. Shekhar Singh, Director, Samya-Centre for Equity Studies, C-17A, DDA Flats, New Delhi – 110 067.
16. Deputy Inspector General, Forest, Government of India, Ministry of Environment & Forests, Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi.
17. Dr. Afroz Ahmad, Member (Environment & Rehabilitation), NCA, Narmada Sadan, Sector B, Scheme No. 74, Vijay Nagar, Indore -452 010, Madhya Pradesh.

- **Member Secretary**

**MINUTES OF THE 49<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NARMADA CONTROL AUTHORITY (NCA)**

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XLIX - 1 (225)	CONFIRMATION OF THE MINUTES OF THE 47 <sup>TH</sup> AND 48 <sup>TH</sup> MEETINGS OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 26.03.2010 AND 01.04.2010 RESPECTIVELY.
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The minutes of the 47<sup>th</sup> and 48<sup>th</sup> Meetings of the Environment Sub-Group of the Narmada Control Authority (NCA) held at New Delhi on 26<sup>th</sup> March, 2010 and 1<sup>st</sup> April, 2010 respectively were circulated to all the Members and Invitees vide NCA's Office letters of even numbers dated 21<sup>st</sup> April, 2010.

Dr. Shekhar Singh, Expert Member informed that he has e-mailed a letter dated 20<sup>th</sup> August, 2016 enclosing therewith a letter dated 14<sup>th</sup> May, 2010 suggesting change/addition in both the minutes and letter dated 24<sup>th</sup> March, 2013 related to Environment and Social impacts of Garudeshwar Weir as part of SSP. He further informed that meeting was taking place after six years time and the Chairman and Members were new and therefore, his letter dated 14.05.2010 seeking change/addition in the Minutes of 47<sup>th</sup> and 48<sup>th</sup> Meetings of Environment Sub-Group of NCA may now be annexed for record.

Member (E&R), NCA pointed out that no comments had been received by him as far as the minutes of the 47<sup>th</sup> and 48<sup>th</sup> meetings were concerned.

The points raised by Dr. Shekhar Singh and Member (E&R), NCA were duly noted. The letter received from Shri Singh has been circulated among all the Members present in the meeting.

It was also agreed that the NCA will regularly update the information received from the State Governments on its website and provide a link to the State Government's website for maintaining absolute transparency on reporting.

It was also agreed that as and when it would be necessary to verify or examine any issue relating to the mandate of the Environment Sub-group of NCA, the services of experts – both individual and institutional – could be utilized. The Chairman would decide on the issue, in case of any urgency, in this regard.

The minutes of the 47<sup>th</sup> and 48<sup>th</sup> meeting were duly noted and confirmed.

The 49<sup>th</sup> Meeting of the Environment Sub-Group of the Narmada Control Authority (NCA) was held on 31<sup>st</sup> August, 2016 at Indira Paryavaran Bhavan, New Delhi under the Chairmanship of Shri Ajay Narayan Jha, Secretary to the Government of India, Ministry of Environment, Forests and Climate Change (MoEF & CC), New Delhi and Chairman, Environment Sub-Group of NCA to review the progress of Environment Safeguard Measures implemented/under implementation by the State Governments concerning Sardar Sarovar Project (SSP). List of participants is enclosed as Annexure-XLIX-Min-(1).

At the outset, the Chairman welcomed the participants and stated that the present meeting is taking place after the elapse of six year time. He further stated that the present meeting is to review the status of Environment Safeguard Measures related to Phase-II of Sardar Sarovar Project (SSP). Thereafter, he invited Member-Secretary to take up the Agenda Items for discussions.

XLIX - 2 (226)	STATUS OF COMPLIANCE OF DECISIONS/ DIRECTIONS OF 48 <sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA
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The Member-Secretary, Environment Sub-Group of NCA read out the decision taken and the directions issued in the 48<sup>th</sup> meeting of Environment Sub-Group and the status of compliance by the concerned State Governments, CWC and NCA on each decisions/directions.

- **The Sub-Group noted the status of compliance as contained in the Agenda at Page – 2-4 and expressed satisfaction.**

XLIX - 3 (227)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)
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1. The Member-Secretary, Environment Sub-Group of NCA presented the background related to the permission of Phase-I of Sardar Sarovar Dam by the NCA, i.e. "*Construction of spillway piers to its full height and bridge and installation of gates (to be kept in raised position)*". The status of *pari passu* implementation of Environmental Safeguard Measures with reference to Phase – II proposal "*Lowering down of the gates and impounding water in the reservoir to full reservoir level to EL 138.68m.*" was also presented by the Member-Secretary and thereafter the Sub-Group discussed the status of Environmental Safeguard Measures.

2. **STATUS OF *PARI-PASSU* IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO PHASE-II PROPOSAL.**

- 2.1. **CATCHMENT AREA TREATMENT (CAT)**

- a. Madhya Pradesh

The representative of Government of Madhya Pradesh (GoMP) submitted that catchment area treatment of Phase-I (directly draining very high and high degraded area) comprising 110997 ha. has already been completed. The catchment area treatment of Phase-II (freely draining very high and high degraded area) comprising 262165 ha., the treatment of 214481 ha. area had also been completed and the treatment of balance 47684 ha. area is in progress and is planned to be completed before monsoon 2017.

- b. Maharashtra

The representative of Government of Maharashtra (GoM) submitted that catchment area treatment of Phase-I (directly draining very high and high degraded area) comprising 23295 ha. has already been completed. The catchment area treatment of Phase-II (freely draining very high and high degraded area) comprising 43125 ha., the treatment of 40175 ha. area had also been completed and the treatment of balance 2950 ha. area will be completed during 2016-17. The Action Plan for the CAT works of balance 2950 ha. was submitted by the GoM during the meeting.

c. Gujarat

The representative of Government of Gujarat (GoG) submitted that catchment area treatment of both Phase-I (directly draining very high and high degraded area) comprising 29157 ha. and Phase-II (freely draining very high and high degraded area) comprising 500 ha. had already been completed.

The Sub-Group decided as follows :

- ▶ **The Government of Madhya Pradesh should submit the Action Plan with time line for the completion of CAT works in the balance 47684 ha. area related to Phase-II by November, 2016.**
- ▶ **The Government of Maharashtra and Madhya Pradesh should accomplish the CAT works related to Phase-II well before monsoon 2017.**

## 2.2. COMPENSATORY AFFORESTATION

a. Gujarat

The representative of Government of Gujarat (GoG) informed that Compensatory Afforestation works in 13950 ha. area (includes 9300 ha. degraded forest and 4650 ha. non forest) had already been completed and the notification of balance 3009 ha. non-forest area brought under compensatory afforestation as reserved/protected forests is in progress and is likely to be completed before monsoon 2017. The representative of GoG submitted that Member (E&R), NCA visited Kutchch Branch Canal (KBC) and Compensatory Afforestation areas during May 2-4, 2016 and inspected the Environmental Safeguard Measures implemented in the KBC for the easy access of wild Ass in the area and also plantation in Kutchch district.

Member (E&R), NCA stated that he has visited KBC and also Compensatory Afforestation areas in Bayat and Bhachau of Kutchch district during May 2-3, 2016. The assessment indicate that the GoG has done good works related to wildlife passage like village road, bridge and siphon for easy access to the wild Ass and other wild fauna in KBC area. The introduction KBC has attracted bird fauna and now water birds in the low-lying areas alongwith the canal and green cover have been observed in the area which indicate the enrichment of biodiversity in the region. The Compensatory Afforestation in Bayat and Bhachau in Kutchch having more than a dozen species of trees, shrubs and grasses have enriched the eco-system and its biodiversity. It has also resulted improvement of the habitat of wild fauna including endangered species like great Indian Bustard.

b. Madhya Pradesh

The representative of Government of Madhya Pradesh (GoMP) informed that Compensatory Afforestation in 8737 ha. area (includes 6538 ha. degraded forest area and 2199 ha. non-forest area) had already been completed. The declaration of 227 ha. non-forest area brought under Compensatory Afforestation as reserved/protected forests is in the process and will be over by February, 2017.

c. Maharashtra

The representative of Government of Maharashtra (GoM) informed that the total task of Compensatory Afforestation in lieu of submergence was 19466 ha. (includes 12977 ha. degraded forests and 6489 ha. non-forest) in Maharashtra. Out of these 19466 ha. area, Compensatory Afforestation has been done in 19379 ha. area (includes 12977 ha. forest and 6402 ha. non-forest). The remaining 87 ha. is balance for Compensatory Afforestation. The Action Plan for the Compensatory Afforestation in 174 ha. degraded forests area in lieu of 87 ha. non-forest area was submitted during the meeting. Accordingly, the GoM is planned to complete balance 174 ha. Compensatory Afforestation in degraded forest area during 2016-17 at the cost of Rs.5.72 crores as per Action Plan.

The representative of GoM further informed that Compensatory Afforestation works in lieu of 4200 ha. forest diverted for rehabilitation in Maharashtra has also been completed. With regard to the notification of remaining 1026 ha. non-forest area brought out under Compensatory Afforestation as reserved/protected forests, the process is ongoing and the same is planned to be completed by November, 2016. He also informed that Member (E&R), NCA has undertaken visit to Compensatory Afforestation areas in Aurangabad district during 22-23 July, 2016.

Member (E&R), NCA stated that he has visited Compensatory Afforestation areas covering 60 ha. in Sulibhanjan in district Aurangabad during July 22-23, 2016. The Compensatory Afforestation was done in 1995 on degraded land covering about 550 ha. area in Aurangabad district. The assessment indicates that dense forests have now been developed with varieties of flora and fauna and the same is under protection of Joint Forest Management Committee. The Compensatory Afforestation also forms a catchment to the series of lakes like Kore Talav, Aam Talav and Jamun Talav. The Compensatory Afforestation has transformed the barren area into green, lively and vibrant landscape and is now fit for Eco-tourism. He suggested that Compensatory Afforestation programme need to be documented in form of brochure since it is related to greening of Sahyadris Hills for its replication in other parts of the State.

The Sub-Group decided as follows :

- ▶ The Governments of Madhya Pradesh, Maharashtra and Gujarat should accomplish the remaining task of declaring non-forest area brought under Compensatory Afforestation as reserved/protected forests by December 2016.
- ▶ The Government of Maharashtra should accomplish the task of Compensatory Afforestation in 187 ha. degraded forest area before June 2017.
- ▶ The State Governments should document the success story of Compensatory Afforestation and upload it on their websites.

### 2.3. COMMAND AREA DEVELOPMENT PLAN

It was noted that the Environmental Safeguard Measures plan for the Command area were required to be prepared by Governments of Gujarat and Rajasthan. Accordingly, Government of Gujarat has prepared Plan for Phase-I and the same is under implementation. The plan for Phase-II (A-D) was required to be prepared by Government of Gujarat. The Government of Rajasthan prepared the plan in 2004 but the same was under revision for inclusion of recommendations of various specialized agencies like health, wildlife, etc. to whom Government of Rajasthan has entrusted the task.

The representative of Government of Gujarat submitted that the Action Plan for Phase-II is in advance stage of finalization and the same will be submitted by October, 2016.

The representative of Government of Rajasthan submitted that Water and Power Consultancy Services (WAPCOS) has been entrusted the task to prepare revised Action Plan after incorporating the suggestions/recommendations of National Institute of Malaria Research (NIMR)/Wildlife Institute of India (WII)/Central Arid Zone Research Institute (CAZRI). He further informed that Member (E&R), NCA may coordinate in the matter since other department like Water Resources are nodal department in the matter and is implementing agency of Narmada Main Canal (NMC) in Rajasthan so that revised Action Plan is formulated by WAPCOS by February, 2017.

Member (E&R), NCA stated that he has undertaken visit to the Narmada Main Canal and Command in the Santhore district, Jalore, Rajasthan on 28.10.2015. The assessment based on interaction with Chairman of Water Users Association and villagers indicate that introduction of Canal has changed their socio-economic conditions and now they are growing variety of crops including horticulture.

Dr. Shekhar Singh, Expert Member was of the view that preparation of Environmental Safeguard Measures for Command Area need to be *pari passu* with the raising of Sardar Sarovar Dam height.

The representative of Government of Madhya Pradesh stated that raising of dam height and *pari passu* implementation of Environmental Safeguard Measures in the Command Area has no linkage since both are separate activities and need to be monitored separately.

The other Members of the Sub-Group endorsed the view expressed by representative of Government of Madhya Pradesh.

- **The Sub-Group decided that both Gujarat and Rajasthan Governments should immediately start preparation of Action Plan for Environmental Safeguard Measures in the Command Area related to Phase-II in Gujarat and revised action plan for the Command Area in Rajasthan are formulated before monsoon of 2017.**

## **2.4. SURVEY OF FLORA, FAUNA AND CARRYING CAPACITY OF SURROUNDING AREAS**

### **4.1. Terrestrial Environment :**

The Sub-Group took note of the material contained in the Agenda concerning Survey of flora – fauna & assessment of carrying capacity, preparation and execution of plans as per recommendations of EIA Studies and Rehabilitation plan for the identified wildlife impacted by submergence.

It was noted that most of the issues related to flora, fauna and carrying capacity have been resolved by the State Governments except declaration of Kathiwara Forest as 'Sanctuary' or 'Natural Reserve' in Madhya Pradesh. The Toranmal Forests has already been declared as 'Conservation Reserve' on 11.07.2016 through Gazette Notification by the Government of Maharashtra.

The representative of Government of Madhya Pradesh stated that in compliance with condition imposed by Ministry of Environment and Forests while according sanction of diversion of forest land in Madhya Pradesh, Government of Madhya Pradesh had formed a committee to suggest measures to be undertaken for rehabilitation of wild life displaced by SSP Reservoir. A meeting of that committee was held on 06.08.2016 and it had been found that proposed Kathiwara Sanctuary is located more than 30 kms. from SSP reservoir and there was no forested corridor



linking it. Hence that committee found that its declaration will not serve the purpose of rehabilitation of wild life displaced by SSP reservoir. Therefore its formation should not be linked with SSP. That committee however, directed that State Forest Research Institute to prepare a DPR for development of environment and wild life habitat in 5616 hectare forest area adjacent to the SSP reservoir and submit the progress of DPR in next meeting of the Committee scheduled to be held on 07.11.2016. The representative and MP Government stated that in view of the committee's recommendations there is no need to declare Kathiwara as a Sanctuary.

The representative of Wildlife Institute of India (WII) submitted that the Narmada Valley Development Authority (NVDA), Government of Madhya Pradesh has entrusted a study on evaluation of ecology and socio-economic consequences of setting up of proposed Mathwad and Kathiwara Wildlife Sanctuary in Madhya Pradesh to the WII in 2007. The WII had conducted the comprehensive EIA study and recommended declaration of Kathiwara as 'Sanctuary' comprising 106 km<sup>2</sup>. Thereafter, the Environment Sub-Group of NCA in its 48<sup>th</sup> Meeting held on 01.04.2010 noticed that declaration of Kathiwara as Wildlife Sanctuary as per WII recommendation is required to be accomplished in time.

He further informed that the Secretary to the Government of India, Ministry of Environment, Forests and Climate Change vide letter dated 21.07.2016 directed WII to carry out a quick survey of the proposed Wildlife Sanctuary and submit a feasibility report of Kathiwara forest to be declared as Sanctuary or Nature Reserve as ground situation was reported to have changed radically. Accordingly, a team of WII faculty and researchers was constituted to conduct rapid assessment of the feasibility of existing Kathiwara Sanctuary in Madhya Pradesh. The team had undertaken field visit daringly 2-5 August, 2016 and submitted their report recommending for the establishment of Kathiwara forest as 'Conservation Reserve'. He further informed that the expenditure incurred on undertaking study need to be reimbursed by NCA/ Government of Madhya Pradesh.

Member (E&R), NCA was of the view that the issue of declaration of Kathiward forest as 'Sanctuary/Conservation Reserve' is pending since 2007 after the recommendations of WII and therefore, it needs to be resolved in the interest of flora, fauna and carrying capacity. He further stated that the recent report of WII needs to be made available to the Government of Madhya Pradesh for the consideration of Committee constituted by Government of Madhya Pradesh for the purpose. With regard to reimbursement of expenditure incurred by WII for recent study as directed by the Chairman, he suggested that Government of Madhya Pradesh may reimburse the same.

Chairman stated that the issue of declaration of Kathiwara as 'Sanctuary/Conservation Reserve' is pending since 2007 and now WII has further studied and recommended for 'Conservation Reserve'. It is high time for Government of Madhya Pradesh to consider the recommendation of WII so that issue gets resolved. He suggested that the report of WII be referred to Government of Madhya Pradesh for consideration.

The Sub-group decided as follows:

- ▶ **The rapid Assessment Report of WII should be made available to Government of Madhya Pradesh for consideration of the recommendation of WII for declaration of Kathiwara as 'Conservation Reserve'.**
- ▶ **The expenditure incurred by WII for undertaking rapid Assessment Study need to be reimbursed by the Government of Madhya Pradesh.**

#### **4.2. Aquatic Environment (Up stream of Sardar Sarovar Dam i.e. Reservoir Management) :**

It was noted that two important aspects namely; fisheries development and conservation in the reservoir and the management of reservoir from the ecology and environment point's of view is required to be undertaken by the State Governments in their territory as per stipulations of the Narmada Water Disputes Tribunal (NWDT) Award.

The representative of Government of Madhya Pradesh informed that State Fishermen Welfare and Fisheries Development Department has prepared fishery development plan for fisheries development and conservation in the reservoir in the territory of Madhya Pradesh. The Action Plan has been submitted to the NCA.

The representative of Government of Maharashtra informed that Action Plan for fisheries development has already been prepared in 2016 and the same is under implementation in the territory of Maharashtra.

The representative of Government of Gujarat submitted that fishery development plan has been prepared and the same is under implementation in the reservoir in the territory of Gujarat.

Member (E&R), NCA stated that Sardar Sarovar Dam (SSD) have resulted a large reservoir having water spread area in Gujarat, Maharashtra and Madhya Pradesh covering about 200 kms. area in length creating a great man-made lake ecosystem. In

view of this, the management of reservoir/lake from ecology and environment point's of view is foremost requirements and therefore, a specialized agency need to be engaged to evolve an Integrated Reservoir Management Plan (IRMP) for the management of Ecology and Environment in the reservoir.

The representative of Government of Gujarat submitted that the Central Inland Fisheries Research Institute (CIFRI) is a specialized Agency and the task of detailed study and preparation of Integrated Action Plan for Reservoir Management from Ecology and Environment point's of view may be entrusted to CIFRI.

The Sub-Group decided as follows :

- ▶ **The State Government may engage CIFRI to prepare a detailed Action Plan for the management of whole reservoir from ecology and environment point's of view in their respective jurisdictions.**
- ▶ **Periodic report shall be filed in this regard with the NCA and also uploaded on the website of each of the State Governments.**

## **2.5. DOWNSTREAM ENVIRONMENT (CONCERNED TO ONLY GUJARAT STATE)**

The Sub-Group noted the status of various studies carried out/ongoing related to the preparation of an Integrated Plan for Environmental Management in the downstream as contained in the Agenda. The Sub-Group has also noted the information related to discharge of 600 cusecs water to downstream from Godbole Gate for environmental flow requirements.

The representative of Government of Gujarat informed that various studies have already been completed and some are in advance stage. He further submitted that the Integrated Action Plan for Environmental Management in the downstream will be submitted to the NCA Secretariat by November, 2016.

## **2.6. SEISMICITY AND RIM STABILITY**

The representative of Government of Gujarat informed that 9 seismic monitoring stations along the periphery of Sardar Sarovar Reservoir (SSR) have been set up and the data collected from these stations are analyzed by the Institute of Seismological Research (ISR), Gandhinagar.

The Government of Gujarat submitted Seismic Bulletin 2012 & 2013 for the period January to December which highlights geological and tectonic set up of the area, earthquake occurrence and seismicity, location of observatories, digital data acquisition, processing and analysis etc.

Member (E&R), NCA stated that recently, he has visited some of the seismic monitoring stations located close to the Sardar Sarovar Dam (SSD) in Gujarat and near reservoir in Kukshi Town of Madhya Pradesh and found them functional.

The Sub-Group took note of the above progress.

## 2.7. HEALTH ASPECTS

The Sub-Group took note of the material contained in the Agenda concerning the status of implementation of health safeguard measures for the SSP areas.

The representatives of State Governments submitted that they are implementing the health safeguard measures as per their Action Plan.

Member (E&R), NCA stated that the Action Plan for Health Care based on EIA studies have been formulated by the States viz. Gujarat in 1986 and 1996, Madhya Pradesh in 1988 and revised plan in 2003 and Maharashtra in 1987, revised plans in 1991, 1996 and 2007. These Action Plan for Health Cares requiring updation by incorporating new schemes of Government of India for health care and also need to be focused to cover villages located in the periphery of the reservoir of SSD.

- **The Sub-Group decided that the State Governments namely; Madhya Pradesh, Maharashtra and Gujarat should revise/update their Action Plan for health care with special emphasis to cover the villages located in the periphery of the reservoir of SSD.**

## 2.8. ARCHAEOLOGY AND ANTHROPOLOGY

It was noted that as per information received from the States, none of the temples/monuments are of National importance in the SSP.

The representative of Government of Maharashtra informed that there is no temple/monuments or mounds under the impact of submergence in Maharashtra.

The representative of Government of Gujarat informed that relocation of 02 temples coming under the impact of submergence had already been made.

The representative of Government of Madhya Pradesh informed that out of 23 monuments/temples coming under the impact of submergence, 20 monuments/temples had already been relocated at appropriate places and the relocation of 03 temples namely; Neel Kanteshwar, Pashupateshwar at village Chikhalda and Deopratiling Mahadeo at village Bodhwada in district Dhar withheld due to resistance of local people as they are still residing in the area. In addition, excavation of 13 mounds has been completed and one museum at Kasrawad has also been established.

- **The Sub-Group was of the view that the remaining 03 temples need to be shifted after due consultation with the villagers.**

XLIX - 4 (228)	STRENGTHENING OF ENVIRONMENT AND REHABILITATION (E&R) WING FOR FIELD MONITORING
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It was noted that the implementation of Environmental Safeguard Measures associated with SSP is in advance stage and also the project is in a crucial stage. He further informed that comprehensive studies on various issues related to impact on Ecology and Environment have been done by various specialized National and International Agencies in case of SSP for the formulation of Environment Management Plan in upstream, downstream of dam and in the command areas by the party States.

The Chairman stated that the NCA is not a Research & Development (R&D) Organization and hence a fixed salary as per contractual rules could be provided to the Research Associate in place of stipend of Research Associate applicable to R&D Organisation. He further desired that in addition to monitoring Environmental Safeguard Measures, proper documentation of the records/reports related to various studies already done and available with the NCA is a must and should be accomplished.

The Sub-Group has appreciated the proposal and decided as follows :

- ▶ **The Research Associate (Monitoring) should be appointed by the NCA on contract basis for a fixed period of 02 years. The essential qualification should be Master in any branch of Natural Sciences, Ph.D. as desirable qualification and experience in the field of Monitoring of Environmental Management Programme.**
- ▶ **The salary of the Research Associate (Monitoring) will be Rs. 50,000/- (fixed) per month, the TA/DA on official tour and NCA accommodation will be provided as permissible to an Assistant Director level officer (s) in the NCA.**
- ▶ **The duty and responsibility of the Research Associate (Monitoring) will be field monitoring of Environmental Safeguard Measures implemented in the party States, documentation of records/reports available in the E&R Wing of NCA. He will work under the supervision of Member (E&R).**

**Annexure-XLIX-Min-(1)**

**LIST OF PARTICIPANTS OF THE 49<sup>TH</sup> MEETING OF THE ENVIRONMENT SUB-GROUP OF NCA HELD ON 31<sup>ST</sup> AUGUST, 2016 (WEDNESDAY) IN THE KAVERI CONFERENCE ROOM, INDIRA PARYAVARAN BHAVAN, NEW DELHI**

<b>Sl. No.</b>	<b>Name and Designation</b>	<b>Member/Invitee</b>
<b>MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE</b>		
1.	Shri Ajay Narayan Jha, Secretary, MoEF&CC, New Delhi.	- <b>Chairman</b>
2.	Shri Gyanesh Bharti, Joint Secretary, MoEF&CC, New Delhi.	- <b>Invitee</b>
<b>NARMADA CONTROL AUTHORITY</b>		
3.	Shri Narendra Kumar, Member (RM), CWC and Executive Member (Addl. Charge), NCA, Indore	- <b>Member</b>
4.	Dr. Afroz Ahmad, Member (Environment & Rehabilitation), NCA, Indore	- <b>Member Secretary</b>
<b>SARDAR SAROVAR CONSTRUCTION ADVISORY COMMITTEE</b>		
5.	Shri Gulshan Raj, Secretary, SSCAC, Vadodara.	- <b>Invitee</b>
<b>MINISTRY OF AGRICULTURE AND FARMERS WELFARE</b>		
6.	Shri Subhash Ch. Ram, Assistant Commissioner, Department of Agriculture & Cooperation, Ministry of Agriculture and Farmers Welfare, New Delhi.	- <b>Invitee Representative</b>
<b>MINISTRY OF CULTURE</b>		
7.	Shri D.N.Panday, Head of Office, Anthropological Survey of India, Kolkata.	- <b>Member Representative</b>
<b>WILDLIFE INSTITUTE OF INDIA</b>		
8.	Dr. V. B. Mathur, Director, WII, Dehradun.	- <b>Member</b>
<b>GOVERNMENT OF GUJARAT</b>		
9.	Shri S.S.Rathore, Chairman and Managing Director, Sardar Sarovar Narmada Nigam Ltd., (SSNNL), Gandhinagar.	- <b>Member</b>
10.	Shri S.D.Vora, APCCF, SSNNL, Gandhinagar.	- <b>Invitee</b>
11.	Shri K.V.Sanghavi, Director, Canal, SSNNL, Gandhinagar.	- <b>Official</b>
<b>GOVERNMENT OF MADHYA PRADESH</b>		
12.	Shri Rajneesh Vaish, Vice-Chairman, Narmada Valley Development Authority (NVDA), Bhopal.	- <b>Member</b>
13.	Shri Lalit Kumar Sood, Subject Matter Specialist (Forests), Narmada Valley Development Authority (NVDA), Bhopal.	- <b>Official</b>
<b>GOVERNMENT OF MAHARASHTRA</b>		
14.	Shri Uday Avsak, Chief Conservator of Forests Dhule, Dhule.	- <b>Invitee &amp; Member Representative</b>
15.	Dr. B.N.Patil, Director, Environment Department, Mumbai.	- <b>Member Representative</b>
<b>GOVERNMENT OF RAJASTHAN</b>		
16.	Shri R.K.Grover, Secretary (Environment), Jaipur.	- <b>Member</b>
<b>EXPERT MEMBERS</b>		
17.	Dr. Shekhar Singh, Executive Director, Samya-Centre for Equity Studies, New Delhi.	- <b>Member</b>

No.8-372/83-FC  
Government of India  
Ministry of Environment and Forests,  
(Department of Environment, Forests and Wildlife)

.....

Paryavaran Bhawan, CGO Complex,  
Lodhi Road, New Delhi-110003

Dated the 6<sup>th</sup> Jan. 1989

To,

The Secretary,  
Agriculture, Forest and Cooperative Department,  
Government of Gujarat,  
Sachivalaya, Gandhinagar.  
The Secretary,  
Forest Department,  
Government of Madhya Pradesh,  
Bhopal.  
The Secretary,  
Revenue & Forest Department,  
Government of Maharashtra,  
Mantralaya, Bombay.

Subject :- Diversion of 13385.45 hectares (6488.54 ha. in Maharashtra, 4165.91 ha. in Gujarat and 2731.00 ha in Madhya Pradesh) of forest land in Dhule, Bharuch and Khargone districts respectively for Sardar Sarovar Project.

Ref. :- 1) FLD-1282-78159-V-1, dated 17.2.83, Govt. of Gujarat.  
2), 5/58/83/10/3, dated 31.8.84, Govt. of Madhya Pradesh.  
3) FLD.1080/111531-II-73 dated 8.9.83, Govt. of Maharashtra.

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Sir,

In continuation to this office letter of even number dated 8<sup>th</sup> Sept, 1987, I am directed to say that the conditions as stipulated at S.No. (vi) and (xi) in the above letter may be substituted by the following :-

- “(vi) A plan for the treatment of the catchment area will be prepared by 31.3.1989 and implemented at the cost of the project”.
- “(xi) Fuelwood depot should be set up by the project authorities who will also arrange alternate fuel like coal, kerosene, bio-gas, LPG, electricity, etc. The supply should be free of cost to the labourers and free or at subsidized rate to the other staff, as may be determined by the project authorities.”

The following conditions may also be added at serial (ii) (a) and (xii):



- “(ii)(a) The non-forest area selected shall be surveyed, demarcated and declared as preserved/protected forests and placed under the control of State Forest Department for raising compensatory afforestation at the cost of the project. Area not found suitable shall be substituted by suitable areas”.
- “(xii) For conservation and management of wildlife, a Committee will be constituted by the State Govt. by 31<sup>st</sup> January, 1989 which will include a representative from the Government of India. The Committee will suggest the necessary steps to be taken and draw up a plan which will be implemented at the cost of the project”.

Other terms and conditions remain the same.

Yours faithfully, ,

sd/-  
(S.P. Singh)  
Asstt. Inspector General of Forests.

# **NARMADA CONTROL AUTHORITY**

## *Environment Sub Group*

*50<sup>th</sup> meeting*

*31<sup>st</sup> August 2016*

*Agenda*

# AGENDA ITEMS

ITEM NO.	CONTENTS
● XLX - 1 (229)	CONFIRMATION OF THE MINUTES OF THE 49 <sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 31.08.2016.
● XLX - 2 (230)	STATUS OF COMPLIANCE ON THE DECISIONS/ DIRECTIONS OF 49 <sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA
● XLX - 3 (231)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH RESPECT TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)

<b>XLX - 1 (229)</b>	<b>CONFIRMATION OF THE MINUTES OF THE 49<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 31.08.2016.</b>
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- The minutes of the 49<sup>th</sup> Meeting of the Environment Sub-Group of the Narmada Control Authority (NCA) held at New Delhi on 31.08.2016 was circulated to all the Members and Invitees vide NCA's Office letters of even numbers dated 17<sup>th</sup> October, 2016.
- The Government of Madhya Pradesh vide letters dated 16.11.2016 and 14.12.2016 has suggested some amendments in paras 2.1, 2.4 and 4.1 of the Minutes. There is no comments from any other Members. The Sub-Group deliberate before confirmation of the Minutes.

<b>XLX - 2 (230)</b>	<b>STATUS OF COMPLIANCE OF DECISIONS/ DIRECTIONS OF 49<sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA</b>
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- The Environment Sub-Group of NCA in its 49<sup>th</sup> meeting held on 31.08.2016 reviewed the *pari-passu* implementation of Environment safeguard measures with reference to the Phase-II proposal “Lowering down of the gates and impounding water in the reservoir to full reservoir level to EL 138.68m.” wherein, the Sub-Group has taken various decisions/issued directions for the completion of balance works.
- The status of compliance by the States are proposed for the discussions under Item No.XLX-3(231).

XLX - 3 (231)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)
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- The Environment Safeguard Measures related to the Sardar Sarovar Project (SSP) implemented/under implementation are mainly in Gujarat, Maharashtra and Madhya Pradesh. In Rajasthan, it is limited to only Command Area in Barmer and Jalore districts.
- The status of implementation of Environmental Safeguard Measures in the States are being reviewed regularly by the Chairman and Member Secretary of the Environment Sub-Group of NCA.

XLX - 3 (231)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)
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- The progress of implementation of Environmental Safeguard Measures in the State of Gujarat, Maharashtra and Madhya Pradesh related to Phase-II proposal "Lowering down of the gates and impounding water in the reservoir to full reservoir level to EL 138.68m." was reviewed in 49<sup>th</sup> Meeting of Environment Sub-Group of NCA held on 31.08.2016 under the Chairmanship of Secretary to the Government of India, Ministry of Environment, Forests and Climate Change. Further, the Member (E&R), NCA reviewed the progress with the concerned officers of Governments of Gujarat, Madhya Pradesh and Maharashtra by convening two meetings on 18.11.2016 and 07.03.2017 at Indore.

XLX - 3 (231)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)
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- In Rajasthan, Member (E&R), NCA has convened a meeting with concerned officers at Jaipur on 17.03.2017 and also undertaken field visit during 18-21 March, 2017 in the Command Areas of Narmada Main Canal in district Barmer and Jalore, held public meeting in Villages with the Chairman, Water Users Association wherein farmers from other villages of the Narmada Command participated.



XLX - 3 (231)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)
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- In Maharashtra, the programmes of implementation of Environmental Safeguard Measures was reviewed by Member (E&R), NCA with the officials of Government of Maharashtra on 16.02.2017. The Member (E&R), NCA has also undertaken field visit to Catchment Treatment works areas in Nandurbar district during March 9-10, 2017.

XLX - 3 (231)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)
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- The Governments of Gujarat, Madhya Pradesh and Maharashtra during the review meetings on 18.11.2016 and 07.03.2017 taken by Member (E&R), NCA with the concerned officials of Governments of Gujarat, Madhya Pradesh and Maharashtra have furnished the latest status report related to the implementation of Environmental Safeguard Measures concerning Phase-II.

## **THE STATUS OF ENVIRONMENTAL SAFEGUARD MEASURES BASED ON INFORMATION FURNISHED BY THE STATES RELATED TO PHASE-II OF SARDAR SAROVAR PROJECT (SSP)**

- 1. CATCHMENT AREA TREATMENT (CAT)**
- 2. COMPENSATORY AFFORESTATION**
- 3. COMMAND AREA DEVELOPMENT (GUJARAT & RAJASTHAN)**
- 4. SURVEY OF FLORA, FAUNA AND CARRYING CAPACITY OF SURROUNDING  
AREAS (TERRESTRIAL AND AQUATIC ENVIRONMENT)**
- 5. DOWNSTREAM ENVIRONMENT (GUJARAT)**
- 6. SEISMICITY AND RIM STABILITY**
- 7. HEALTH ASPECTS**
- 8. ARCHAEOLOGY AND ANTHROPOLOGY**

## 1. CATCHMENT AREA TREATMENT (CAT)

The CAT works have been undertaken in two phases i.e. Phase-I (directly draining very high and high degraded area) and Phase-II (freely draining very high and high degraded area).

### A. Phase-I (directly draining very high and high degraded area)

(Areas in Ha)

Sl. No.	Description	M.P.	Gujarat	Maharashtra	Total
1.	Catchment below Indira Sagar Project	2248600	30230	163611	2442441
2.	Very High and High degraded area*	433740	30230	100993	564963
3.	Phase I area: Directly draining Very High and High degraded area	115622	29730	24298	169650
4.	Phase I area: Target (after deducting untreatable area on account of being rocky/steep slope, etc.**	110997	29157	23295	163449
5.	Phase I area: Achievement	110997	29157	23295	163449
6.	Phase I area: Achievement in %	100%	100%	100%	100%

\* All India Soil and Land Use survey Organization

\*\* Untreatable

## 1. CATCHMENT AREA TREATMENT (CAT)

### B. Phase-II (freely draining very high and high degraded area)

(Areas in Ha)

Sl. No.	Description	M.P.	Gujarat	Maharashtra	Total
7.	Phase II area: Freely draining Very High and High degraded area	318118	500	77568	396186
8.	Phase II area: Target (after deducting untreatable area on account of being rocky/steep slope, etc.)**	262165	500	43125	305790
9.	Phase II area: Achievement	214481	500	40175	255156
10.	Phase II area: Achievement in %	81.81%	100%	93.15%	83.5%

\* All India Soil and Land Use Survey Organization.

\*\* Balance area is untreatable.

- The balance CAT works related to Phase-II are 24412 ha. in Madhya Pradesh and 2950 ha. in Maharashtra.
- ✓ ● The Governments of Maharashtra and Madhya Pradesh have submitted the Action Plan, Latest progress may be reported by Madhya Pradesh and Maharashtra.

## 2. COMPENSATORY AFFORESTATION

- Approval for diversion of forest land for the SSP was granted by the Ministry of Environment and Forests (MoEF) in 1987, 1990 and in 1994.
  - In 1987 for the submerged forest land 13385.45 ha. (6488.54 ha. in Maharashtra, 4165.95 ha. in Gujarat and 2731 ha. in Madhya Pradesh).
  - In 1990 and 1994 approval for diversion/release of 4200 ha. (2700 ha. + 1500 ha.) forest land in Maharashtra (Dhule district) for R&R of PAFs of SSP by MoEF & CC under Section 2 of the Forest (conservation) Act, 1980.
- Conditions stipulated relating to the planning and implementation of Compensatory Afforestation (CA) :
  - There should be compensatory afforestation on equivalent area in non-forest land in addition to reforestation of double the area in degraded forest for every hectare of forestland submerged or diverted for construction of the project.
  - An equal area of non-forestland or double the area of degraded forest should be planted for the 4200 hectare of forest land in Maharashtra, which is to be used for R&R.

## □ Status of Compensatory Afforestation in lieu of 13386 ha forest area diverted for submergence

Sl. No.	State		Target (ha)	Achievement (ha)	Achievement (%)
✓ 1	Gujarat	Degraded Forest Area ✓	9300	9300 ✓	100%
		Non Forest Area ✓	4650	4650 ✓	100%
		Total ✓	13950	13950 ✓	100%
✓ 2	Madhya Pradesh	Degraded Forest Area ✓	6538	6538 ✓	100% ✓
		Non Forest Area ✓	2199	2199 ✓	100% ✓
		Total ✓	8737	8737 ✓	100% ✓
✓ 3	Maharashtra	Degraded Forest Area ✓	12977	12977 ✓	100%
		Non Forest Area	6489	6402* ✓	98.6%
		Total	19466	19379 ✓	99.5%
GRAND TOTAL			42153	42066 ✓	99.7%

\* In Maharashtra, 87 ha. non-forest area is required to be brought under Compensatory Afforestation. Maharashtra has proposed Compensatory Afforestation in 174 ha. of degraded forest and submitted Action Plan.

➤ The Government of Maharashtra may inform the status of Compensatory Afforestation in balance 174 ha. degraded forest.

☐ **Compensatory Afforestation in lieu of 4200 ha. forest area diverted for rehabilitation in Maharashtra.**

**Area diverted (Target) = 4200 ha.**

**Achievement = 4197.5 ha.**  
**(remaining area unfit for plantation)**

**Achievement (%) = 99.9%**



## ❑ Efficacy of Plantations

The rate of survival of the plantations and the year of reporting :

Activities	Gujarat	Maharashtra	Madhya
Survival percentage/ year of reporting	50% non-forest areas below 50 % in degraded forest land (2004).	80% of non-forest and degraded forest areas with 42% success (2007).	26% in non-forest area and 45% in forest area (2008).

- The Governments of Gujarat, Maharashtra and Madhya Pradesh may inform the latest status of rate of survival of plantation based on latest assessment.

**❑ Progress in notification of plantation on non-forest area as reserved/protected forests**

States	Area to be declared (ha)	Area under declaration	% Achievement
✓ Gujarat (Under Section-4)	4650	4650	100%
✓ Gujarat (Under Section-20)	4650	1640.35	35.28% ✓
✓ Madhya Pradesh	2059.81	2059.81	100% ✓
✓ Maharashtra	10602	10505	99.08% ✓

● The State Governments may inform :

- In Gujarat, the status of notification of 3010 ha. non-forest area brought under Compensatory Afforestation as Reserved/ Protected Forests.
- In Maharashtra, the status of notification of 97 ha. non-forest area brought under Compensatory Afforestation as Reserved/ Protected Forests.

### **3. COMMAND AREA DEVELOPMENT**

- **The Environmental Safeguard Measures plan for the Command Area in Gujarat and Rajasthan were required to be prepared. Accordingly, Governments of Gujarat and Rajasthan have prepared and submitted to the NCA Secretariat.**
- **The Government of Rajasthan is required to declare a Bird Sanctuary in the Canal Escape Area. Member (E&R), NCA visited the area and discussed the matter with concerned officers of Government of Rajasthan and the declaration is in progress.**

## 4. SURVEY OF FLORA, FAUNA AND CARRYING CAPACITY OF SURROUNDING AREAS

### ● Terrestrial Environment :

Key Issues/Target	Achievements		
	Gujarat	Maharashtra	Madhya Pradesh
<b>Survey of flora – fauna &amp; assessment of carrying capacity</b>	M.S. University, Vadodara, Report of 1992 on submergence and other impact areas.	Deptt. of Environmental Sciences, University of Pune Report of 1994 for SSP areas in Maharashtra	SFRI, Jabalpur Report of 1993 and WLL Report of 2008 for SSP areas in Madhya Pradesh
<b>Preparation and execution of plans as per recommendations of EIA Studies.</b>	Identified plant species are being preserved at MS University's Botanical garden. e-herbarium have also been established in the University and the same was placed in public domain on 12.03.2016. The plan for the conservation of bio-diversity in Shoolpaneshwar sanctuary areas is also under implementation.	Buffer zone plantations covering 2500 ha is completed	Social forestry plan had been taken up to enhance fuel and fodder availability. Sixty island to be formed at FRL of SSP Reservoir are to be left undisturbed.

● **Terrestrial Environment :**

Key Issues/Target	Achievements		
	Gujarat	Maharashtra	Madhya Pradesh
Rehabilitation plan for the identified wildlife impacted by submergence.	The area of <u>Shoolpaneshwar</u> sanctuary located close to the dam was extended from 102 km <sup>2</sup> to 608 km <sup>2</sup> during 1989 to provide shelter to wildlife.	The <u>Toranmal Forest</u> has been declared as 'Conservation Reserve' by Government of Maharashtra.	A committee constituted by Government of Madhya Pradesh found that the proposed Kathiawara Sanctuary is located more than 30 kms from Sardar Sarovar Project (SSP) reservoir and there is no forested corridor linking it, and hence its declaration will not serve the purpose of rehabilitation of wildlife displaced by SSP reservoir. Committee directed State Forest Research Institute (SFRI), Jabalpur to prepare DPR for development of environment and wild life habitat in 5616 hectare of forest area known as Mathwad range adjacent to SSP reservoir. In view of this, there is no need to declare Kathiawara Sanctuary.  SFRI is in the process of preparation of the DPR.

- The Government of Madhya Pradesh may inform the latest progress about preparation of DPR by SFRI, Jabalpur.

❑ Aquatic Environment (Up stream of Sardar Sarovar Dam i.e. Reservoir Management) :

● Fisheries Development and Conservation

- The Governments of Madhya Pradesh, Maharashtra and Gujarat has undertaken programmes for fisheries development and conservation in the Reservoir located in their territory.

- The states may report latest progress.

● Reservoir Management from Ecology point's of view.

- The Governments of Gujarat, Maharashtra and Madhya Pradesh are in process to engage CIFRI for this task.

- States may report latest progress.

## 5. DOWNSTREAM ENVIRONMENT (GUJARAT STATE)

- The downstream of the dam is exclusively in the Gujarat. There are various studies carried out/ongoing for evolving an Integrated Plan for Environmental Management in the downstream. It includes;
  - Mathematical Model studies for assessment of water quality by CWPRS (completed).
  - Morphological Studies for River Narmada from SS Dam up to the Sea (Completed).
  - Mathematical Model studies for Routing of Flows in River Narmada from SS Dam up to the Sea (awaited).
  - Studies on Impact on Ecological Functions and Fisheries Downstream of Sardar Sarovar Dam (CICFRI) completed and further report is awaited.
  - Draft report of EIA of emerging Sardar Sarovar Reservoir (SSR) completed.
- The Government of Gujarat is ensuring discharge of 600 cusecs for downstream from Godbole Gate for environmental flow requirements. These flows are being monitored by Sardar Sarovar Reservoir Regulation Committee of NCA.
- The Government of Gujarat may inform the latest status of integrated plan for Environmental Management in downstream of the dam.

## 6. SEISMICITY AND RIM STABILITY

- The studies of Reservoir Induced Seismicity (RIS) and Rim Stability have been carried out by the Geological Survey of India (GSI), Central Water and Power Research Station (CWPRS), University of Roorkee. Accordingly, the design and construction of the dam have been carried out as follows:
  - Horizontal seismic design coefficient of 0.12 g. adopted on the recommendation of the Dam Review Panel.
  - Stress monitors installed in the main body of the dam.
  - The depth of the Foundation increased to 18 m. below the lowest point of riverbed.



## 6. SEISMICITY AND RIM STABILITY

- As regards, Seismic monitoring, 9 seismic monitoring stations along the periphery of Sardar Sarovar Reservoir have been set up. Data from these monitoring stations are being regularly collected and analyzed by Institute of Seismic Research (ISR), Gandhinagar, and put up before the Dam Safety Review Panel of Sardar Sarovar Project.
- This is for the information of the Sub-Group.

## **7. HEALTH ASPECTS**

- **The Health issues primarily concerns (i) Disease surveillance, (ii) regular monitoring of incidences of water borne diseases and (iii) health delivery system in the project areas both on preventive and curative fronts. The Surveillance of water borne diseases is normally being carried out under Integrated Disease Surveillance Project (IDSP) and National Rural Health Mission (NHRM) of Govt. of India.**

## 7. HEALTH ASPECTS

- The status of implementation of health safeguards for the Sardar Sarovar Project area is as under:-

Action	Gujarat	Maharashtra ✓	Madhya Pradesh ✓
EIA studies	By State Council of Health and Medical Services (SCHMS), 1994 ✓	By T.N. Medical college Mumbai and Medical college Dhule district. ✓	By Gandhi Medical College Bhopal and ICMR New Delhi ✓
Action Plan	Action plan of 1986 and draft plan of 1996 ✓	Action Plan of 1987 revised in 1991, 1996 and 2007 ✓	Action Plan 1988 revised in August 2003. ✓
Diseases monitoring in impacted areas of SSP	Through SCHMS, besides routine district wise surveillance under IDSP or NHRM of Govt. of India. ✓	Routine surveillance under IDSP or NHRM of Govt. of India. ✓	Dedicated surveillance studies through NIMR of ICMR besides routine surveillance under IDSP or NHRM of Govt. of India.
Establishment of health facilities at Dam site/ Peripheral villages.	progressing ✓	progressing ✓	progressing
Vector control measures	As per plan of 1986 ✓	As per plan of 2007 ✓	As per plan of 2003

➤ This is for the information of the Sub-Group.

## **8. ARCHAEOLOGY AND ANTHROPOLOGY**

- **The archaeological and anthropological aspects have been addressed by Survey of the antiquities to be salvaged, documentation for the purpose of the record, relocation / excavation of the monuments / mounds, display of the retrieved cultural heritage artifacts in museums, etc.**
- **Accordingly, the State Governments have prepared their work plans. The none of the monuments are of national importance in Sardar Sarovar Project.**

## 8. ARCHAEOLOGY AND ANTHROPOLOGY

- The current status of protection / relocation works is as under:

Contents	Gujarat ✓	Maharashtra ✓	Madhya Pradesh ✓
Monuments	<u>2</u> (completed)	Nil	16 completed, 4 in progress, 3 (temples) remaining due to local resistance.
Mounds	Nil	Nil	All 13 mounds upto FRL completed. ✓
Museums/Parks	Nil	Nil	One museum at Kasrawad established. 3 additional galleries in lieu of 3 other museums found unviable. A separate building in Narmada Sanskriti Kendra proposed.

- The Government of Madhya Pradesh may inform the latest progress about protection/relocation of balance monuments/temples.

केवल सरकारी प्रयोग के लिए  
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# नर्मदा नियंत्रण प्राधिकरण NARMADA CONTROL AUTHORITY

पर्यावरण उपदल  
Environment Sub-Group

पचासवीं बैठक का कार्यवृत्त  
Minutes of the 50<sup>th</sup> Meeting

स्थान : कावेरी सभा कक्ष, इंदिरा पर्यावरण भवन, नई दिल्ली

Venue : Kavery Conference Room,  
Venue : Indira Paryavaran Bhawan, New Delhi

दिनांक : 1 मई, 2017

Date : 1<sup>st</sup> May, 2017

समय : 15:00 बजे

Time : 15:00 Hrs.

इन्दौर  
मई, 2017

Indore  
May, 2017



XLIX - 3 (231)	REVIEW OF THE STATUS OF <i>PARI-PASSU</i> IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO THE PHASE-II PROPOSAL "LOWERING DOWN OF THE GATES AND IMPOUNDING WATER IN THE RESERVOIR TO FULL RESERVOIR LEVEL (138.68M.)"
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1. The Member-Secretary, Environment Sub-Group of NCA stated that the Environmental Safeguard Measures related to the Sardar Sarovar Project (SSP) implemented/under implementation are mainly in Gujarat, Maharashtra and Madhya Pradesh. In Rajasthan, it is limited to only Command Area in Barmer and Jalore districts.

1.1. The status of implementation of Environmental Safeguard Measures in the States was reviewed in 49<sup>th</sup> Meeting of the Sub-Group held on 31.08.2016 and thereafter, two follow-up meetings to review the status of compliance by the States on the decisions of Environment Sub-Group were convened by Member (Environment and Rehabilitation), NCA on 18.11.2016 and 07.03.2017 at Indore.

1.2. The status of *pari passu* implementation of Environmental Safeguard Measures with reference to Phase — II proposal "*Lowering down of the gates and impounding water in the reservoir to full reservoir level to EL 138.68m.*" was also presented by the Member-Secretary and thereafter the Sub-Group discussed the status of Environmental Safeguard Measures.

2. STATUS OF PARI-PASSU IMPLEMENTATION OF ENVIRONMENT SAFEGUARD MEASURES WITH REFERENCE TO PHASE-II PROPOSAL.

2.1. CATCHMENT AREA TREATMENT (CAT)

a. Madhya Pradesh

The representative of Government of Madhya Pradesh (GoMP) submitted that catchment area treatment of Phase-I (directly draining very high and high degraded area) comprising 110997 ha. has already been completed (100%). The catchment area treatment of Phase-II (freely draining very high and high degraded area) comprising 262165 ha., the treatment of 237753 ha. area (90.70%) had been completed and the treatment of balance 24412 ha. area (9.3%) is in progress and is planned to be completed by June, 2017.



b. Maharashtra

The representative of Government of Maharashtra (GoM) submitted that catchment area treatment of Phase-I (directly draining very high and high degraded area) comprising 23295 ha. has already been completed (100%). The catchment area treatment of Phase-II (freely draining very high and high degraded area) comprising 43125 ha., the treatment of 40175 ha. area had also been completed (93.16%) and the treatment of balance 2950 ha. area (6.84%) is in progress and the same will be completed by June, 2017.

c. Gujarat

The representative of Government of Gujarat (GoG) submitted that catchment area treatment of both Phase-I (directly draining very high and high degraded area) comprising 29157 ha. and Phase-II (freely draining very high and high degraded area) comprising 500 ha. had already been completed (100%).

The Sub-Group decided as follows :

- The Governments of Maharashtra and Madhya Pradesh should accomplish the CAT works related to Phase-II by June, 2017 and submit Action Taken Report (ATR) for completion of works in first week of July, 2017 to the office of Member (E&R), NCA.
- Periodic review will be carried out by Member (E&R) on fortnightly basis on the progress made and all the states will furnish reports in this regard at fortnightly intervals. Member (E&R) will keep the Chairman apprised of the progress made accordingly on fortnightly basis.

## 2.2. COMPENSATORY AFFORESTATION

a. Gujarat

The representative of Government of Gujarat (GoG) informed that Compensatory Afforestation works in 13950 ha. area (includes 9300 ha. degraded forest and 4650 ha. non forest) had already been completed and the notification of balance 3009 ha. non-forest area brought under compensatory afforestation as reserved/protected forests is in various stages of declaration like all 3009 ha. have already been notified under Section 4 and various other process required for declaration is in progress and is planned to be completed by July, 2017.



The representative of Government of Gujarat further submitted that the rate of survival of plantations is about 70% as per latest assessment.

b. Madhya Pradesh

The representative of Government of Madhya Pradesh (GoMP) informed that Compensatory Afforestation in 8737 ha. area (includes 6538 ha. degraded forest area and 2199 ha. non-forest area) had already been completed. He further informed that all 2199 ha. non-forest area brought out under Compensatory Afforestation had already been declared reserved/protected forests.

c. Maharashtra

The representative of Government of Maharashtra (GoM) informed that the total task of Compensatory Afforestation in lieu of submergence was 19466 ha. (includes 12977 ha. degraded forests and 6489 ha. non-forest) in Maharashtra. Out of these 19466 ha. area, Compensatory Afforestation has been done in 19379 ha. area (includes 12977 ha. forest and 6402 ha. non-forest). In lieu of the remaining 87 ha. balance, Compensatory Afforestation have been planned in 174 ha. degraded forests and the same is in progress and planned to be completed by first week of July, 2017.

The representative of GoM further informed that Compensatory Afforestation works in lieu of 4200 ha. forest diverted for rehabilitation in Maharashtra has also been completed. With regard to rate of survival of the plantation, the GoM representative submitted that it is 80% in non-forest and more than 42% in degraded forests. The notification of remaining 67 ha. non-forest area brought out under Compensatory Afforestation as reserved/protected forests, is in progress and the same is planned to be completed by 31<sup>st</sup> May, 2017.

Member (E&R), NCA stated that Compensatory Afforestation programme carried out by the States need to be documented in form of brochures and placed on Website of the State Governments for disseminating information as success story of raising plantation.

Dr. Uma Melkania, expert Member and Dr. G.P. Sinha, Scientist, Botanical Survey of India endorsed the views expressed by Member (E&R), NCA.

The Chairman of the Sub-Group stated that documentation on Compensatory Afforestation highlighting plantation, species composition, survival rate, impact of plantation on wildlife and micro-climate etc. need to be done by the State Governments.



The Sub-Group decided as follows :

- The Governments of Maharashtra and Gujarat should accomplish the remaining task of declaring non-forest area brought under Compensatory Afforestation as reserved/protected forests by 31<sup>st</sup> May and 31<sup>st</sup> July, 2017 respectively.
- Government of Gujarat will ensure that preparatory steps for declaration of reserved/protected forests will be taken well in time for the final declaration to be completed by 31<sup>st</sup> July, 2017.
- The Government of Maharashtra should accomplish the task of Compensatory Afforestation in 174 ha. degraded forest area by June, 2017 and submit ATR to the office of Member (E&R), NCA by first week of July, 2017.
- The State Governments should document the success story of Compensatory Afforestation and upload it on their websites.

### 2.3. COMMAND AREA DEVELOPMENT PLAN

It was noted that the Environmental Safeguard Measures plan for the Command area were required to be prepared by Governments of Gujarat and Rajasthan. Accordingly, Government of Gujarat has prepared Plan for Phase-I and Phase-II. The Government of Rajasthan prepared the plan in 2004 but the same was under revision for inclusion of recommendations of various specialized agencies like health, wildlife, etc. to whom Government of Rajasthan has entrusted the task. Accordingly, Government of Rajasthan had also submitted plan for the Command Area Development.

Member (E&R), NCA stated that he has undertaken visit to the Narmada Main Canal and Command in the districts, Jalore and Barmer during 20-21 March, 2017 and held public meeting in villages. The assessment based on interaction with Chairman of Water Users Association and villagers indicate that introduction of Canal has changed their socio-economic conditions and now they are growing variety of crops including horticulture and cash crops like Jeera and Isabgol.

He further stated that the introduction of Narmada Canal in Arid and Semi Arid regions of Gujarat and Rajasthan have resulted tremendous socio-economic impacts including enhancement of bio-diversity and impacts of micro-climate, etc. He emphasized that Impact Assessment of Canal Irrigation in Arid/Semi Arid regions need to be undertaken to assess the impact of socio-economic and state of Environment in the region.



## 2.8. ARCHAEOLOGY AND ANTHROPOLOGY

It was noted that as per information received from the States, none of the temples/monuments are of National importance in the SSP.

The representative of Government of Maharashtra informed that there is no temple/monuments or mounds under the impact of submergence in Maharashtra.

The representative of Government of Gujarat informed that relocation of 02 temples coming under the impact of submergence had already been made.

The representative of Government of Madhya Pradesh informed that out of 23 monuments/temples coming under the impact of submergence, 20 monuments/temples had already been relocated at appropriate places and the relocation of 03 temples namely; Neel Kanteshwar, Pashupateshwar at village Chikhaldia and Deopratiling Mahadeo at village Bodhwada in district Dhar withheld due to resistance of local people as they are still residing in the area and now these 03 temples will be shifted alongwith Project Affected Families (PAFs) *pari passu* with the impoundment of water in the reservoir. The excavation of 13 mounds has been completed and one museum at Kasrawad has also been established.

To a query from the representative of Archaeological Survey of India regarding proper documentation of temples/monuments or mounds being relocated, the representative of GoMP submitted that proper documentation had already been made and the same is available with Archaeology Department of State Government.

- The Sub-Group was of the view that the remaining 03 temples need to be shifted *pari passu* with the shifting of Project Affected Families (PAFs) and impoundment of water in the reservoir.

2.9. Member (E&R), NCA stated that the status of implementation of Environmental Safeguard Measures clearly indicates that substantial compliance had already been made by the State Government with regard to Phase-II proposal of the SSP and therefore, Sub-Group may consider to convey clearance to Phase-II proposal.

Chairman, expressed satisfaction on the progress of Environmental Safeguard Measures associated with Phase-II proposal. He desired that State Governments should submit their commitment to accomplish the balance residual works within timeline fixed by the Sub-Group.



The other Members of the Sub-Group endorsed the views expressed by Member (E&R) and Chairman, Environment Sub-Group of NCA. Thereafter, the Sub-Group decided as follows:-

1. The Sub-Group has reviewed the Environmental Safeguard Measures namely, Catchment Area Treatment (CAT), Compensatory Afforestation (CA), Command Area Development (CAD) [related only to Gujarat and Rajasthan], Survey of flora, fauna and carrying capacity (terrestrial and aquatic environment), health aspects, downstream environment in Gujarat only, Archaeology and Anthropology, fisheries development and conservation, implemented / under-implementation by the Governments of Madhya Pradesh, Gujarat, Maharashtra and Rajasthan related to full reservoir level of the Sardar Sarovar Dam i.e. 138.68 m.
2. The Sub-Group has examined the progress of implementation of Environmental Safeguard Measures associated with the Sardar Sarovar Project (SSP) as reported by the officers of four state governments during the meeting which indicates that substantial compliance had already been made with regard to implementation of Environmental Safeguard Measures. The Sub-Group observed that the Environmental Management Programmes associated with the Sardar Sarovar Project (SSP) is continuing process and therefore, utmost importance need to be attached by implementing agencies to ensure sustainable Environmental Management in the Narmada Basin.
3. The Sub-Group directed Government of Gujarat to expedite declaration of 3009 ha. non forest area brought under Compensatory Afforestation which are at various stages of declaration as reserved/protected forests need to be declared by July, 2017 to which Government of Gujarat agreed. The discharge of 600 cusecs water should continue from Godhole Gate for maintaining environmental flow downstream and the implementation of integrated plan for environmental management in the downstream of the dam.
4. The Sub-Group directed Government of Maharashtra to complete the Afforestation in 174 ha. degraded forest land by June, 2017, Catchment Area Treatment works in balance 2950 ha. area under Phase-II by July, 2017 and declaration of 67 ha. non forest area brought under Compensatory Afforestation as reserved/protected forest by May, 2017. The representative of Government of Maharashtra agreed to complete in above timeline.



5. The Sub-Group directed Government of Madhya Pradesh to accomplish the task of catchment area treatment in Phase-II comprising of 24142 ha. by June, 2017. The environmental improvement programmes including conservation of wildlife in 5616 ha. of forest area adjacent to Sardar Sarovar Reservoir as suggested by the Committee of Wildlife should be ensured in consultation with State Forest Research Institute (SFRI), Jabalpur. The representative of Government of Madhya Pradesh assured to complete CAT works in time line and the progress related to implementation of programmes for habitat improvement and wildlife conservation shall be sent on monthly basis to the office of Member (E&R), NCA.
6. The Sub-Group has expressed concern about felling of trees in the submergence area and directed the state governments to ensure clear felling of vegetation upto 134.68 mt. and in *pari-passu* with the filling of the Sardar Sarovar reservoir. State Govts. informed that clear felling in the forest area has been completed and only the trees on panchayat and private land are remaining to be cut.
7. The Sub-Group reiterated the need for constant monitoring of environmental safeguard measures implemented by governments of Gujarat, Madhya Pradesh, Maharashtra and Rajasthan. The Sub-Group directed State Governments to submit status of Environmental Safeguard Measures under implementation on monthly basis to the NCA Secretariat. The Sub-Group has also advised the state governments to upload data related to environmental safeguard measures implemented in three states with due consultation with Narmada Control Authority secretariat.
8. Since, the substantial compliance of Environmental Safeguard Measures namely; Catchment Area Treatment (CAT), Compensatory Afforestation (CA), Survey of flora, fauna and carrying capacity (terrestrial and aquatic environment), Command Area Development (CAD), downstream environment, seismicity, health aspects and Archaeology and Anthropology associated with Sardar Sarovar Project (SSP) at full height of the dam i.e. 138.68 mt. had already been made by the State Governments namely, Gujarat, Maharashtra, Madhya Pradesh and Rajasthan, the Sub-group considers that the clearance to present proposal can be recommended to the NCA.
9. Accordingly, the Environment Sub-group conveys its clearance to the NCA for implementation of Phase-II proposal subject to compliance of the conditions/directions mentioned above, by the State Governments.

केवल सरकारी प्रयोग के लिए  
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# नर्मदा नियंत्रण प्राधिकरण NARMADA CONTROL AUTHORITY

पर्यावरण उपदल  
Environment Sub-Group

## इक्यावनवीं बैठक की कार्यसूची Agenda for the 51<sup>st</sup> Meeting

स्थान : कावेरी सभा कक्ष, इंदिरा पर्यावरण भवन, नई दिल्ली

दिनांक : 21 अगस्त, 2019  
Date : 21<sup>st</sup> August, 2019

Venue : Kavery Conference Room,  
Indira Paryavaran Bhavan, New Delhi

समय : 12:00 बजे  
Time : 12:00 hrs.

इन्दौर,  
जुलाई, 2019

INDORE  
July, 2019



**नर्मदा नियंत्रण प्राधिकरण**  
(जल संसाधन मंत्रालय, भारत सरकार)  
**NARMADA CONTROL AUTHORITY**  
(Ministry of Water Resources, Govt. of India)



No. NCA/Env./51<sup>st</sup>/2019/ 490

By Speed Post  
31<sup>st</sup> July, 2019

2-8-2019

To

All the Members/Invitees  
of Environment Sub-Group of NCA  
(As per list enclosed)

Sub: 51<sup>st</sup> Meeting of the Environment Sub-Group of NCA.

Sir/Madam,

The 51<sup>st</sup> Meeting of the Environment Sub-group of Narmada Control Authority is scheduled to be held on 21<sup>st</sup> August, 2019 (Wednesday) at 12:00 hrs. in Kavery Conference Room of Ministry of Environment, Forests and Climate Change, 4<sup>th</sup> Floor, "Prithvi Block", Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110 003. The Agenda of the meeting is enclosed herewith.

You are requested to kindly make it convenient to attend the meeting.

Yours faithfully

Encl : As above.

(Suman Sinha)

Member (Environment & Rehabilitation) and  
Member Secretary- Environment Sub-Group

Copy for kind information and necessary actions to;

1. The PPS to Secretary (WR, RD&GR) & Chairman, NCA, Shram Shakti Bhawan, Rafi Marg, New Delhi.
2. The PPS to Secretary (E, F & CC) & Chairman, Environment Sub Group of NCA, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110 003.

# **LIST OF MEMBERS OF THE ENVIRONMENT SUB-GROUP OF NCA**

1. Shri C.K.Mishra, Secretary to the Govt. of India, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003 ,  
- **Chairman**
2. Shri M.Gopal Reddy, Vice-Chairman, NVDA, Government of Madhya Pradesh, Narmada Bhawan, 59 Arera Hills, Jail Road, BHOPAL-462 003 (MP).
3. Dr. Rajiv Kumar Gupta, Managing Director, SSNNL, Govt. of Gujarat, 1<sup>st</sup> Floor, Block No.12, New Sachivalaya, Gandhinagar-382010 (Gujarat).
4. Shri Anil Udhavrao Diggikar, Principal Secretary (Environment), Government of Maharashtra, Environment Department, 217 Annex, Opp. Mantralaya, 2<sup>nd</sup> Floor, Mumbai – 400 032, Maharashtra.
5. Dr. M.K.Sinha, Executive Member, NCA, Narmada Sadan, Sector B, Scheme No. 74, Vijay Nagar, Indore -452 010, Madhya Pradesh.
6. Ms. Shikha Mehra, Secretary (Environment), Government of Rajasthan, Environment Department, Sachivalaya, Jaipur – 302 005, Rajasthan.
7. Shri Nitishwar Kumar, Joint Secretary (Admn.), Ministry of Water Resources, River Development & Ganga Rejuvenation, Shram Shakti Bhawan, Rafi Marg, New Delhi.
8. Director, Anthropological Survey of India, Anthropological Survey of India, 27 Jawaharlal Nehru Road, Kolkata – 700 016, West Bengal.
9. Prof. Balram Bhargava, Secretary, Department of Health Research and Director General, Indian Council of Medical Research, V.Ramalingaswami Bhawan, Ansari Nagar, Post Box No. 4911, New Delhi – 110 029.
10. Dr.Usha Sharma, Director General, Archaeological Survey of India, Dharmohar Bhawan ,24 Tilak Marg, New Delhi
11. Deputy Director General, Soil Agronomy and Engineering, ICAR, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
12. Dr. V. B. Mathur, Director Wildlife Institute of India, Post Box No. 18, Chandrabani, Dehradun 248 001, Uttarakhand.
13. Dr.P.P.Majumdar, Professor & Chairman, Department of Civil Engineering, Indian Institute of Science, Bangalore, Karnataka.
14. Dr. (Mrs.) Uma Melkania, Professor & Head, Department of Environmental Science, G.B.Pant University of Agriculture and Technology, Pantnagar, Uttaranchal.
15. Dr. Shekhar Singh, Director, Samya-Centre for Equity Studies, C-17A, DDA Flats, New Delhi – 110 067.
16. Deputy Inspector General, Forest, Government of India, Ministry of Environment & Forests. Paryavaran Bhawan, CGO Complex, Lodi Road, New Delhi.,
17. Smt.Suman Sinha, Member (Environment & Rehabilitation), NCA, Narmada Sadan, Sector B. Scheme No. 74, Vijay Nagar, Indore -452 010, Madhya Pradesh.

- **Member Secretary**



**LIST OF INVITEES OF THE  
ENVIRONMENT SUB-GROUP OF NCA**

1. Shri Sudarsan Sethi, Additional Chief Secretary (Environment), Environment Department, Government of Rajasthan, Room No. 321-A, SSO Bhawan, Sachivalaya, Jaipur – 302 005, Rajasthan.
2. Shri Vikas Kharage, Secretary (Forests), Revenue and Forests Department, Government of Maharashtra, Mantralaya, Mumbai – 400 032, Maharashtra.
3. Ms.Geeta Menon, Joint Secretary, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003.
4. Shri C.K.Patil, Member (Environment and Forests), Narmada Valley Development Authority, Narmada Bhavan, 59 Arera Hillis, Jail Road, Bhopal – 462 011, Madhya Pradesh.
5. Shri S.M.Saiyyad, Additional Principal Chief Conservator of Forests, Sardar Sarovar Narmada Nigam Ltd., Block No.12, New Sachivalaya Complex, Gandhinagar – 382 010, Gujarat.
6. Director General, Health Services, 4<sup>th</sup> Floor, Government Dental College Building, St. George Hospital Compound, Mumbai – 400 001, Maharashtra.
7. Joint Secretary, Ministry of Agriculture, Government of India, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
8. Shri Rajendra Pawar, Secretary (CAD), Water Resources Department, Government of Maharashtra, Mantralaya, Mumbai – 400 032, Maharashtra.
9. Shri Anupam Rajan, Commissioner, Department of Archaeology, Archives and Museum, Government of Madhya Pradesh, Bangaga Marg, T.T.Nagar, Bhopal.
10. Shri M.P.Singh, Secretary, Sardar Sarovar Construction Advisory Committee, A-Block, 4<sup>th</sup> Floor, Narmada Bhawan, Indira Avenue, Vadodara, Gujarat.
11. Dr.Tejinder Singh, Addl.Principal Chief Conservator of Forests (Central), Ministry of Environment and Forests, Western Regional Officer, E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal – 462016, Madhya Pradesh.
12. Additional Commissioner, Government of India, Ministry of Agriculture, Krishi Bhawan, Dr.Rajendra Prasad Marg, New Delhi – 110 001.
13. Shri G.P.Sinha, Scientist E & Head of Office, Botanical Survey of India, Central Regional Central, 10 Chetham Lines, Allahabad – 211 002, Uttar Pradesh.
14. Director, National Institute of Communicable Diseases, 22 Shyam Nath Marg, New Delhi – 110 007.
15. Shri Md.A.G.Ansari, Chief Executive Director, Narmada Hydroelectric Development Corporation (NHDC) Ltd., Corporate Office, NHDC Parisar, Near Hotel Lake View Ashoka, Shyamla Hills, BHOPAL - 462 013, Madhya Pradesh.
16. Shri A.S.Karaskar, Chief Conservator of Forests Dhule, Government of Maharashtra, Jamnagiri Road, Near S.R.P. Camp. Opp. Fauzdar Quarter, Dhule-424001.
17. Joint Secretary, Department of Indian System of Medicine and Homoeopathy, IRCS Building, 1, Red Cross Road, New Delhi – 110 001.

## AGENDA FOR THE 51<sup>ST</sup> MEETING OF THE ENVIRONMENT SUB-GROUP OF NARMADA CONTROL AUTHORITY

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ITEM No. LI - 1 (232)	CONFIRMATION OF THE MINUTES OF THE 50 <sup>TH</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 01.05.2017.
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The Minutes of the 50<sup>th</sup> Meeting of Environment Sub-Group of the Narmada Control Authority (NCA) held at New Delhi on 1<sup>st</sup> May, 2017 were circulated to all the members and invitees vide NCA's office Letter No. NCA/Env./50<sup>th</sup>/2017/1803-43, dated 23<sup>rd</sup> May, 2017 with the request to furnish their comments within 21 days from issue of the Minutes. No comments from any party States or any other Members was received within the stipulated time period.

The Sub Group may like to confirm the minutes as circulated.

ITEM No. LI - 2 (233)	TO REVIEW THE ENVIRONMENT FLOW OF RIVER NARMADA IN THE DOWN STREAM OF SARDAR SAROVAR DAM
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Unlike Cauvery Water Disputes Tribunal, which had allocated 10 TMC for Environmental flow during hot weather season and considered 4 TMC as inevitable escape to sea; allocating only 726 TMC out of available 740 TMC of water, Narmada Water Disputes Tribunal didn't allocate any water for the environmental considerations and allocated entire utilizable flow amongst the party States. It would be pertinent to reproduce the extract from para 6.9.4 and 6.9.5 of the Vol. I of the Report of NWDT on the Gujarat's Claim for releases for use below Navagam as under;

*6.9.4 In Exhibit G-86 page 20, Gujarat has given figures of annual irrigation and withdrawals by three irrigation schemes which lift water directly from the Narmada river. The annual irrigation adds upto 7734 acres only and the withdrawal for it to 1239 mcft per annum. An additional withdrawal of 223 mcft is shown for Baroch water supply scheme. The total committed use is thus 1472 mcft or 0.033MAF. After the construction of Sardar Sarovar Dam, there still be considerable discharge in the river downstream of the dam during rainy season and in the remaining period on appreciable flow of regenerated water. On creation of Sardar Sarovar and introduction of irrigation from Navagam canal on the right bank of river and Karjan Project on the left bank, the present regenerated flow would get augmented by more than twice the committed use of 0.33 MAF. This river flow, apart from the available groundwater there, would be sufficient to meet these requirements...*

*6.9.5 In view of what has been stated in these paragraphs, it is not possible to accept Gujarat's plea for apportionment of water for downstream uses.*

However, the Environment Sub Group of Narmada Control Authority headed by the Union Secretary (EF&CC) directed Govt. of Gujarat to study and make an assessment of environmental flow required downstream of Sardar Sarovar Dam. During the 41<sup>st</sup> meeting of the Environment Sub-Group held on 6<sup>th</sup> January, 2005, the Govt. of Gujarat indicated that as study report have indicated that 600 cusecs would

be adequate for maintaining environment downstream [Annex-LI-1]. Accordingly, the Environment Sub-Group directed to maintain a minimum flow of 600 cusecs downstream of Sardar Sarovar dam for environmental purposes, which is being maintained continuously through Godbole Weir in Dyke No. 3 of Sardar Sarovar Project. This flow was found adequate being supplemented with releases through RRBPH of the order of 7000 cusecs, as well as releases through Karzan & Orsang distributaries of River Narmada downstream of Sardar Sarovar Dam.

Unfortunately, during the Water Year 2017-18 and 2018-19 due to deficit rainfall in Narmada river basin and consequently deficit yield in the river basin, the RRBPH could not be operated. This has resulted severe water crisis in downstream areas of Sardar Sarovar Dam including downstream Bharuch district of Gujarat.

In this regards Ministry and NCA has received several representations to increase the e-flow from present 600 Cusecs to 1500 Cusecs. An Original Application (OA) No. 361/2018 filed by Narmada Pradushan Nivaran Samiti and others vs. Ministry of Environment, Forest and Climate Change (MoEF&CC) & others regarding increasing environmental flow of River Narmada down stream of Sardar Sarovar Dam in Gujarat was also filed before Hon'ble National Green Tribunal (NGT) – Principal Bench, New Delhi. Hon'ble NGT disposed the OA No.361 of 2018 on 25.01.2019. On 29.01.2019 Hon'ble NGT in its corrected order directed Applicants to present the matter before Narmada Tribunal/ Narmada Control Authority.

The relevant para of the judgement are as below:

*“Therefore it would be appropriate that the present matter be also placed before the Narmada Tribunal / Narmada Control Authority so as to consider all aspects of the grievance raised by the Applicant. The Applicant would be free to represent his case before the Tribunal / Authority.”*

The copies of the orders are placed at Annex-LI-2 & 3. The Applicants instead of going to NCA, they have filed Civil Appeal (CA) 4550 of 2019 against the impugned order dated 25<sup>th</sup> January, 2019 passed by National Green tribunal, (Principal Bench), New Delhi in Original Application No. 361 of 2018. The case is under consideration before Hon'ble Supreme Court.

On 01.07.2019 during the briefing for the Rajya Sabha Starred Question No.\*104 regarding concering downstream environment of Sardar Sarovar Project (SSP) Hon'ble Minister, Ministry of Jalshakti instructed to approach Environment Sub Group for review of the quantum of e-flow with the consent of party States.

The present affective height of the dam is FRL (138.68m.) and therefore, an assessment to arrive on the requirements of water for sustaining the downstream environment is need of the hour. The study for downstream environment is already ongoing through CIFRI and therefore the then Member (Environment& Rehabilitation), Narmada Control Authority vide DO letter No. NCA/M(E&R)/ENV/2015 dated 31.05.2018 addressed to The Chairman and Managing Director, SSNNL requested for assessment of environmental flow requirement in downstream and suggested to carry out the study related to assessment of environmental flow requirement from CIFRI [[Annex-LI-4](#)]. Accordingly SSNNL entrusted the same to CIFRI vide their letter No. SSNNL/Env/CIFRI/MPlan/DS/156-157 dated 11.06.2018 [[Annex-LI-5](#)].

NCA also received a representation dated 12.04.2019 from Rohit Prajapati and others of Prayavaran Suraksha Samiti, Vadodara Gujarat regarding problems in down stream areas of Narmada River. NCA has forwarded the representation on 16.05.2019 to Chief Secretary, Government of Gujarat for necessary action [[Annex-LI-6](#)].

The Sub-Group may deliberate and review the quantum of environmental flow downstream of Sardar Sarovar Dam. As already clarified earlier, this quantum being unutilizable flow would be deducted from the utilizable flow before apportioning amongst the party States, so that even in the year when utilizable flow is equal to the environmental flow, the environmental flow can be maintained. The Sub Group may also consider specifying this environmental flow to be maintained throughout the Narmada river length from Bargi reservoir to Gulf of khambhat (Arabian sea).

ITEM No. LI - 3 (234)	ANY OTHER ITEMS, WITH THE PERMISSION OF THE CHAIR
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केवल सरकारी प्रयोग के लिए  
For Official use only



नर्मदा नियंत्रण प्राधिकरण  
**NARMADA CONTROL AUTHORITY**

पर्यावरण उपदल  
**Environment Sub-Group**

इक्यावनवीं बैठक का कार्यवृत्त  
**Minutes of the 51<sup>st</sup> Meeting**

स्थान : नई दिल्ली  
**Venue : New Delhi**

दिनांक : 21 अगस्त, 2019  
**Date : 21<sup>st</sup> August, 2019**

इन्दौर,  
सितम्बर, 2019

INDORE  
September, 2019





# नर्मदा नियंत्रण प्राधिकरण

Page 963

(जल शक्ति मंत्रालय, जल संसाधन, नदी विकास एवं गंगा संरक्षण विभाग, भारत सरकार)

## NARMADA CONTROL AUTHORITY

(Ministry of Jal Shakti, Department of Water Resources, RD&GR, Govt. of India)

नर्मदा सदन, सेक्टर-बी, स्कीम नं. 74 सी, विजय नगर, इन्दौर-452 010 (म. प्र.)

Narmada Sadan, Sector-B, Scheme No. 74-C, Vijay Nagar, Indore-452 010 (M.P.), INDIA

संख्या : ननिप्रा/पर्या/51वी/2019/1843-1877

By Speed Post

16 सितम्बर, 2019

सेवा में

नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल  
के सभी सदस्य एवं आमंत्रित गण  
(संलग्न सूची के अनुसार)

विषय : नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 51वी बैठक का कार्यवृत्त ।

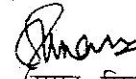
महोदय/महोदया,

नर्मदा नियंत्रण प्राधिकरण के पर्यावरण उपदल की 21 अगस्त, 2019 को नई दिल्ली में संपन्न 51वी बैठक के कार्यवृत्त की एक प्रति भेजी जा रही है ।

आपसे अनुरोध है कि, उक्त कार्यवृत्त पर अपनी टिप्पणियाँ/सुझाव (यदि कोई हो) कार्यवृत्त जारी होने की तारीख से इक्कीस (21) दिनों की समय सीमा में इस कार्यालय में भेजने का कष्ट करें ।

भवदीया

संलग्नक : उपरोक्तानुसार ।

  
(सुमन सिन्हा)

सदस्य (पर्यावरण एवं पुर्नवास) एवं

सदस्य सचिव - पर्यावरण उपदल

दूरभाष : 2554333

प्रतिलिपि :

1. प्रधान निजी सचिव, जल शक्ति मंत्रालय, जल संसाधन, नदी विकास एवं गंगा संरक्षण विभाग, भारत सरकार, श्रम शक्ति भवन, रफी मार्ग नई दिल्ली-110 001 ।
2. प्रधान निजी सचिव, पर्यावरण वन और जलवायु परिवर्तन मंत्रालय, भारत सरकार, इंदिरा पर्यावरण भवन, जोरबाग मार्ग, नई दिल्ली - 110 003 ।



# नर्मदा नियंत्रण प्राधिकरण

(जल शक्ति मंत्रालय, जल संसाधन, नदी विकास एवं गंगा संरक्षण विभाग, भारत सरकार)

## NARMADA CONTROL AUTHORITY

(Ministry of Jal Shakti, Department of Water Resources, RD&GR, Govt. of India)

नर्मदा सदन, सेक्टर-बी, स्कीम नं. 74 सी, विजय नगर, इन्दौर-452 010 (म. प्र.)

Narmada Sadan, Sector-B, Scheme No. 74-C, Vijay Nagar, Indore-452 010 (M.P.), INDIA

No. NCA/Env./51<sup>st</sup>/2019/

By Speed Post  
16<sup>th</sup> September, 2019

To

All the Members/Invitees  
of Environment Sub-Group of NCA  
(As per list enclosed)

Sub: Minutes of the 51<sup>st</sup> Meeting of the Environment Sub-Group of NCA.

Sir/Madam,

Please find enclosed herewith a copy of the Minutes of 51<sup>st</sup> Meeting of the Environment Sub-group of Narmada Control Authority held on 21<sup>st</sup> August, 2019 at New Delhi.

Your comments/observations (if any), on the Minutes, may kindly be communicated to this office within twenty one days from the date of issue of the Minutes.

Yours faithfully

Encl : As above.

  
(Suman Sinha)

Member (Environment & Rehabilitation) and  
Member Secretary- Environment Sub-Group

Copy for kind information and necessary actions to;

1. The PPS to Secretary (WR, RD&GR) & Chairman, NCA, Shram Shakti Bhawan, Rafi Marg, New Delhi.
2. The PPS to Secretary (E, F & CC) & Chairman, Environment Sub Group of NCA, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110 003.

**LIST OF MEMBERS OF THE  
ENVIRONMENT SUB-GROUP OF NCA**

1. Shri C.K.Mishra, Secretary to the Govt. of India, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003  
- **Chairman**
2. Prof. Balram Bhargava, Secretary, Department of Health Research and Director General, Indian Council of Medical Research, V.Ramalingaswami Bhawan, Ansari Nagar, Post Box No. 4911, New Delhi – 110 029.
3. Shri M.Gopal Reddy, Vice-Chairman, NVDA, Government of Madhya Pradesh, Narmada Bhawan, 59 Arera Hills, Jail Road, BHOPAL-462 003 (MP).
4. Dr. Rajiv Kumar Gupta, Managing Director, SSNNL, Govt. of Gujarat, 1<sup>st</sup> Floor, Block No.12, New Sachivalaya, Gandhinagar-382010 (Gujarat).
5. Shri Anil Udhavrao Diggikar, Principal Secretary (Environment), Government of Maharashtra, Environment Department, 217 Annex, Opp. Mantralaya, 2<sup>nd</sup> Floor, Mumbai – 400 032, Maharashtra.
6. Dr. M.K.Sinha, Executive Member, NCA, Narmada Sadan, Sector B, Scheme No. 74, Vijay Nagar, Indore -452 010, Madhya Pradesh.
7. Dr. D.N.Pandey, Secretary (Environment), Government of Rajasthan, Environment Department, Sachivalaya, Jaipur – 302 005, Rajasthan.
8. Shri Nitishwar Kumar, Joint Secretary (Admn.), Ministry of Jal Shakti, Deptt. of Water Resources, River Development & Ganga Rejuvenation, Shram Shakti Bhawan, Rafi Marg, New Delhi.
9. Dr. V. B. Mathur, Director Wildlife Institute of India, Post Box No. 18, Chandrabani, Dehradun 248 001, Uttarakhand.
10. Director, Anthropological Survey of India, Anthropological Survey of India, 27 Jawaharlal Nehru Road, Kolkata – 700 016, West Bengal.
11. Dr.Usha Sharma, Director General, Archaeological Survey of India, Dharmoahar Bhawan, 24 Tilak Marg, New Delhi
12. Deputy Director General, Soil Agronomy and Engineering, ICAR, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
13. Dr.P.P.Majumdar, Professor & Chairman, Department of Civil Engineering, Indian Institute of Science, Bangalore, Karnataka.
14. Dr. (Mrs.) Uma Melkania, Professor & Head, Department of Environmental Science, G.B.Pant University of Agriculture and Technology, Pantnagar, Uttaranchal.
15. Dr. Shekhar Singh, Director, Samya-Centre for Equity Studies, C-17A, DDA Flats, New Delhi – 110 067.
16. Deputy Inspector General (Forest), Government of India, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003.
17. Smt.Suman Sinha, Member (Environment & Rehabilitation), NCA, Narmada Sadan, Sector B, Scheme No. 74, Vijay Nagar, Indore -452 010, Madhya Pradesh.  
- **Member Secretary**

**LIST OF INVITEES OF THE  
ENVIRONMENT SUB-GROUP OF NCA**

1. Shri Sudarsan Sethi, Additional Chief Secretary (Environment), Environment Department, Government of Rajasthan, Room No. 321-A, SSO Bhawan, Sachivalaya, Jaipur – 302 005, Rajasthan.
2. Shri Vikas Kharage, Secretary (Forests), Revenue and Forests Department, Government of Maharashtra, Mantralaya, Mumbai – 400 032, Maharashtra.
3. Ms. Geeta Menon, Joint Secretary, Ministry of Environment, Forests & Climate Change, Jal Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003.
4. Shri C.K. Patil, Member (Environment and Forests), Narmada Valley Development Authority, Narmada Bhavan, 59 Arera Hills, Jail Road, Bhopal – 462 011, Madhya Pradesh.
5. Shri S.M. Saiyyad, Additional Principal Chief Conservator of Forests, Sardar Sarovar Narmada Nigam Ltd., Block No. 12, New Sachivalaya Complex, Gandhinagar – 382 010, Gujarat.
6. Director General, Health Services, 4<sup>th</sup> Floor, Government Dental College Building, St. George Hospital Compound, Mumbai – 400 001, Maharashtra.
7. Joint Secretary, Ministry of Agriculture, Government of India, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
8. Shri Rajendra Pawar, Secretary (CAD), Water Resources Department, Government of Maharashtra, Mantralaya, Mumbai – 400 032, Maharashtra.
9. Shri Anupam Rajan, Commissioner, Department of Archaeology, Archives and Museum, Government of Madhya Pradesh, Bangaga Marg, T.T. Nagar, Bhopal.
10. Shri M.P. Singh, Secretary, Sardar Sarovar Construction Advisory Committee, A-Block, 4<sup>th</sup> Floor, Narmada Bhawan, Indira Avenue, Vadodara, Gujarat.
11. Dr. Tejinder Singh, Addl. Principal Chief Conservator of Forests (Central), Ministry of Environment and Forests, Western Regional Officer, E-5, Kendriya Paryavaran Bhawan, E-5 Arera Colony, Link Road-3, Ravishankar Nagar, Bhopal – 462016, Madhya Pradesh.
12. Additional Commissioner, Government of India, Ministry of Agriculture, Krishi Bhawan, Dr. Rajendra Prasad Marg, New Delhi – 110 001.
13. Shri G.P. Sinha, Scientist E & Head of Office, Botanical Survey of India, Central Regional Central, 10 Chetham Lines, Allahabad – 211 002, Uttar Pradesh.
14. Director, National Institute of Communicable Diseases, 22 Shyam Nath Marg, New Delhi – 110 007.
15. Shri Md.A.G. Ansari, Chief Executive Director, Narmada Hydroelectric Development Corporation (NHDC) Ltd., Corporate Office, NHDC Parisar, Near Hotel Lake View Ashoka, Shyamla Hills, BHOPAL - 462 013, Madhya Pradesh.
16. Shri Amit Kalaskar, Chief Conservator of Forests Dhule, Government of Maharashtra, Jamnagiri Road, Near S.R.P. Camp, Opp. Fauzdar Quarter, Dhule-424001.
17. Joint Secretary, Department of Indian System of Medicine and Homoeopathy, IRCS Building, 1, Red Cross Road, New Delhi – 110 001.

**MINUTES OF THE 51<sup>st</sup> MEETING OF ENVIRONMENT SUB-GROUP  
OF THE NARMADA CONTROL AUTHORITY (NCA)**

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## INTRODUCTION

The 51<sup>st</sup> Meeting of the Environment Sub-Group of the Narmada Control Authority (NCA) was held on 21<sup>st</sup> August, 2019 in Kavery Conference Room of Ministry of Environment Forest and Climate Change (MoEF&CC), 4<sup>th</sup> floor, Prithvi Block, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi – 110 003 under the Chairmanship of Shri C.K. Mishra, Secretary to the Government of India, MoEF&CC and Chairman, Environment Sub-Group of NCA. List of participants is enclosed as Annexure- **LI-Min-(1)**.

At the outset, the Chairman welcomed the participants and stated that representatives from the Government of Gujarat could not participate due to some unavoidable reasons. After a brief introduction by participant, Executive Member, NCA was asked to take up the Agenda Items for discussions.

LI - 1 (232)	<b>CONFIRMATION OF THE MINUTES OF THE 50<sup>th</sup> MEETING OF ENVIRONMENT SUB-GROUP OF NCA HELD ON 01.05.2017.</b>
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The Executive Member, NCA stated that the minutes of 50<sup>th</sup> meeting of Environment Sub-Group of NCA held on 01.05.2017 were circulated to all the Participating Members and State Governments on 23<sup>rd</sup> May 2017. Till date no comments has been received from any Member/party States.

The Sub Group confirmed the minutes as circulated.

LI - 2 (233)	<b>TO REVIEW THE ENVIRONMENT FLOW OF RIVER NARMADA IN THE DOWN STREAM OF SARDAR SAROVAR DAM</b>
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The Executive Member, NCA stated NWDT Award was published in 1979 when the concept of environmental flow was not that established. As such NWDT Award didn't stipulate anything towards environment flow. However, this Sub Group asked Gujarat to ascertain the environment flow requirements and in 41<sup>st</sup> meeting held in 2005, Govt. of Gujarat indicated that their studies indicate that 600 cusecs would be adequate for maintaining environment flow downstream of Sardar Sarovar dam. Hence this Sub-Group decided that a minimum constant discharge of 600 cusecs of water be maintained downstream of Sardar Sarovar Dam, which is being maintained through Godbole Weir in Dyke No. 3 of Sardar Sarovar Project. This 600 cusecs of water, when supplemented by the water released after generation of power from the River Bed Power House, was found sufficient to maintain the ecology and environment in the downstream reach of Sardar Sarovar Dam. But due to drought/deficient river yield in the last two years, Power House could not be operated and this 600 cusec water was found insufficient and there have been a number of representations to increase this environment flow quantum.

A petition was also filed before the Hon'ble NGT and Hon'ble NGT directed them to approach Narmada Control Authority and now they have filed a Writ Petition in before the Hon'ble Supreme Court, and subsequently notices have been issued.

In the meantime, Govt. of Gujarat has entrusted a study to Central Inland Fisheries Institute for assessing the downstream flow requirements, which is under progress. The petitioners have requested for increasing the quantum of environment flow to 1500 cusecs, which is also endorsed by the Govt. of Gujarat.



The Govt. of Rajasthan representative asked about its impact on other States. The Executive Member, apprised that as clarified by this Sub-Group and also ratified by Narmada Control Authority that this quantum would not be part of utilizable flow. Hence, the utilizable flow would get reduced by the environment flow and increasing environment flow would reduce the utilizable flow and correspondingly, it would impact other Party States' share. Endorsing this, the Chairman stated that this would impact everyone and thus there is a need to consider this issue holistically taking all stakeholders on board.

The Chairman stated that since Govt. of Gujarat has entrusted a Study and any decision must be consistent with the Study's findings. It would therefore be appropriate to consider the issue after receipt of the Study Report when representatives of Govt. of Gujarat be are also present to consider the issue in totality.

The Executive Member, further Stated that some demands have also been received about maintaining environment flow in Madhya Pradesh State as well. The MoEF&CC representative informed that in pursuance of a directive from NGT, the Ministry has issued directive to all the Project Authorities to maintain a minimum environment flow and that would apply to Madhya Pradesh also. The representative of Govt. of Madhya Pradesh stated that their State is also considering specifying a minimum environment flow from its reservoirs.

LI - 3 (234)	ANY OTHER ITEMS, WITH THE PERMISSION OF THE CHAIR
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There was no other item.

The meeting ended with a vote of thanks from the Chairman.

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**Annexure LI-Min-(1)**

**List of Participants attended the 51<sup>st</sup> Meeting of the Environment Sub-Group of NCA held on 21<sup>st</sup> August, 2019 (Wednesday) in the Kaveri Conference Room, Indira Paryavaran Bhavan, Jor Bagh Road, New Delhi – 110 003**

**Ministry of Environment, Forests and Climate Change, New Delhi**

1. Shri C.K. Mishra, Secretary, MoEF&CC and Chairman, Environment Sub-Group of NCA - **Chairman**
2. Dr. S. Kerketta, Director, MOEF&CC
3. Smt. Geeta Menon, Joint Secretary, MOEF&CC
4. Shri Manmeet Singh, Consultant, MOEF&CC

**Narmada Control Authority**

5. Dr. Mukesh Kumar Sinha, Executive Member, NCA Indore
6. Smt. Suman Sinha, Member (E&R), NCA, Indore - **Member Secretary**
7. Shri R. Vasudevan Dy. Director (Admin), NCA, Indore
8. Shri S.R. Yadav, Dy. Director (Reh), NCA, Indore
9. Shri Manish Rathore, Dy. Director (Civil), NCA, Indore
10. Shri D.S. Rawat, Deputy Director (Liaison), NCA, New Delhi

**Botanical Survey of India**

11. Dr. G.P.Sinha, Scientist E, HoD, Botanical Survey of India, Allahabad, U.P.

**Wildlife Institute of India**

12. Dr. J.A. Johnon, Scientist E, Wildlife Institute of India, Dehradun, UK

**Indian Council of Medical Research**

13. Dr. Geetika Yadav, Scientist –E, Indian Council of Medical Research, Ansari Nagar, New Delhi.

**Government of Madhya Pradesh**

14. Shri C.K. Patil, Member (Environment & Forest), NVDA, Narmada Bhavan, Arera Hills, Bhopal - 460 011

**Government of Maharashtra**

15. Shri S.B. Kewate, Dy. Conservator of Forest, Nandurbar Forest Division, Shahada, Dist. Nandurbar – 425 412.
16. Shri S.F. Gavit, Executive Engineer, Narmada Development Division, Thodai Mata Temple Road, Nandurbar – 425 412
17. Shri J.N. Sanis, Deputy Executive Engineer, Narmada Development Division, Thodai Mata Temple Road, Nandurbar – 425 412
18. Mr E Ravendiran, MS, MPCB. Sion, Maharashtra

**Government of Rajasthan**

19. Dr. D.N. Pandey, Secretary, Environment Department, Secretariat, Jaipur, Rajasthan

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