REPORT OF EXPERT COMMITTEE ON REHABILITATION & ENVIRONMENTAL ASPECTS OF TEHRI HYDRO-ELECTRIC PROJECT

VOLUME - I

NEW DELHI OCTOBER 1997

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CHAPTER - I

I - INTRODUCTION

1.1 CONSTITUTION OF THE COMMITTEE

The Government of India had been receiving from time to time certain demands for further examination of certain rehabilitation and environmental issues relating to the Tehn Project. After a careful consideration of these representations, the Government of India decided to constitute a review committee for the purpose. The composition of the Committee as per the order issued by the Ministry of Power, No. 19/18/96-Hydel-II dated 17 09.1996 (copy at Annexure- I.1), was as under:

 Prof. C.H.Hanumantha Rao, Former Member, Planning Commission

Chairperson

2. Ms. Anna Malhotra, Chairperson, Expert Committee on River Valley Hydroelectric projects, Ministry of Environment & Forests,

Member

3. Dr. Kirit Parikh, Director Indira Gandhi Institute of Development Research, Mumbal.

Member

4. Dr. T.N. Khoshoo,

Tata Energy Research Institute
New Delhi.

Member

 Shri V.K. Sinha, Society for Service to Voluntary Agencies, New Delhi.

Member

 Prof. Ramaswamy R. Iyer, Centre for Policy Research, New Delhi.

Member

7. Prof. S. Parasuraman, Tata Institute of Social Sciences Mumbai.

Member

8. Prof. Shekhar Singh, Indian Institute of Public Administration, New Delhi.

Member

9. Shri N.D. Jayal, The Himalaya Trust, Dehradun.

Member

10. Principal Secretary (Revenue)
Govt. of U.P.
Lucknow.

Member

11. Principal Chief Conservator of Forests,
Govt. of U.P.
Lucknow.

Member

12. Shri M.L. Gupta, Chairman & Managing Director, THDC, Tehri

Member

Shri D.P.S. Lamba, Director (Personnel), Tehn Hydro Development Corporation, was to be the Secretary of the Committee.

Shri T.N. Khoshoo expressed his inability to attend the meetings of the Committee because of ill health and opted out of the Committee.

Shri B.P. Maleta, Principal Chief Conservator of Forests (Uttarakhand) Nainital under whose charge was this area, initially attended the meetings, instead of PCCF, Lucknow. Suitable modifications in the MOP order dated 17.09.96 were made by the Ministry of Power vide their reference number 19/18/96- Hydel II dated 24.04.97. Shri M.C.Ghildiyal, who subsequently took over as PCCF, Uttarakhand attended the subsequent meetings from the X meeting of the Committee.

Shri Babu Ram, Principal Secretary (Revenue), Govt. of U.P. attended the meetings of the Committee upto the X Meeting. At that stage he was transferred to some other deptt. by the Govt. of U.P. and XI to XVII meetings were attended by Shri Laxmi Chand who took over as Principal Secretary(Revenue). Later on Shri Laxmi Chand was also transferred and Shri S.P. Arya who took over as Principal Secretary (Revenue) attended the meetings upto XIX Meeting after which he was also transferred. At the time of last meeting (XX Meeting) Sh. P.C. Sharma was the Principal Secretary (Revenue), who could not attend the Meeting.

1.2 TERMS OF REFERENCE OF THE COMMITTEE

The terms of reference of the Committee, as per the Government order, were as follows:

- To examine the Rehabilitation Policy for the Tehri project and suggest modification, if any;
- To examine the implementation of the rehabilitation package and suggest measures for rectification of lacunae in implementation, if any; and
- To examine the implementation of various conditions of environmental clearance except that relating to safety aspects and design of the Tehri Dam and suggest additional or improved environmental safeguards, if any, based on data and information now available.

1.3 TIME FOR SUBMISSION OF REPORT

The Committee was required to submit its Report within 3 months. However, the Committee found that the entire exercise was very time-consuming and, was therefore, obliged to request for extensions of time for the submission of its Report.

1.4 MEETINGS OF THE COMMITTEE

The Committee held twenty meetings, apart from a 5 day field visit to the project area and the resettlement colonies/ New Tehri Town (NTT), besides meetings of sub-groups on rehabilitation and on environment chapters. The meetings were held on:

I - 26.10.1996 II - 16.11.1996 III - 09.12.1996

(Visit to the project area/resettlement colonies- 19.12.96 to 23.12.96).

IV 13.01.1997 V 24 & 25.01.1997 VI 13 & 14.02.1997 VII 26 & 27.02.1997 VIII 06 & 07.03.1997 IX 31.03.97& 01.04.1997 X 07.04.1997 Χi 18 & 19.04.1997 XII 24 & 25.04.1997 XIII 05 & 06.05.1997 XIV - 18 & 19.05.1997 XV 06,07 & 08.06,1997 XVI 06 & 07.07.1997 XVII 22 & 23.08.1997 XVIII 07.09.1997 XIX 21.09.1997 XX 26.10.1997

During its deliberations, the Committee also invited the following officials/ experts for presentations/ discussions.

- 1. Shri Bhudev Prasad Lakhera, Ex-Chairman, Zila Parishad, Tehri.
- 2. Shri Ratan Singh Gunsola, Chairman, Zila Parishad, Tehri
- 3. Shri R. Rajamani, Ex-Secretary, MOEF
- 4. Dr. S. Maudgal, Sr. Advisor, MOEF
- 5. Dr. R.K. Mazari, Wadia Institute of Himalayan Geology, Dehradun.
- 6. Sh. T.K.A. Nair, Secretary, MOEF
- 7. Dr. P.C. Nawani, Sr. Geologist, GSI, Tehri

8. Prof. L.S. Srivastava, Ex-Head, Deptt. of Earthquake Engineering, University of Roorkee

The Committee had also requested Shri Sunder Lal Bahuguna to meet the Committee at Delhi. During the visit to project area also he was requested to meet the Committee. However, the meeting with Shri Bahuguna did not materialise.

1.5 VISITS TO PROJECT/RESETTLEMENT AREAS

The Committee held three meetings before making a visit to the project area. During these meetings, the Committee decided on the methodology to know first hand the grievances of the local population. It was decided that the Committee will visit the site in 3rd & 4th week of December,1996 and invite representations from the people through a notification to be published in local newspapers.

Accordingly, on 16th November, 1996, a notification was issued by the Chairperson of the Committee for publication in the newspapers intimating that Members of the Expert Committee would be visiting the area between 3rd & 4th week of December, 1996 and that any one who wants to make any representation in this connection might write to the Commissioner, Garhwal, Dehradun by 7th December, 1996. This notification was published in the Amar Ujala, Dainik Jagaran, Rashtriya Sahara and the Times of India.

In response to this notification, representations of individual persons and various groups were received at Commissioner's Office and also directly by the Chairperson at his residential address.

The Committee, during its visit on 20.12.96 (AN) and 21.12.96 heard the people at Chamba, Zila Parishad Hall, villages in Bhilangana as well as Bhagirathi Valley, and various resettlement colonies and received representations. The villages visited in the Bhilangana valley were: Bhadon-ki-Magri, Tipri, Pipla Khas, Badkot, Nandgaon. Pipal Dali, Asena, Kail Bagi, Gajna, Ghonti. In the Bhagirathi Valley, the Committee visited the villages - Malideval, Goran, Sirain, Pratap Nagar, Plas, Dobra, Saur-Uppu, Bhaldiana, Dang, Chham & Biryani. On 21.12.96 the Committee Member, Prof. Parasuman also saw the survey registers, randomly selected records and files of the individuals etc. On 22.12.96 the Committee visited New Tehn Town and saw sample flats of different categories and some institutions/office buildings built by the Project Authorities, and also visited the Pathn Block resettlement colony and heard individuals and representatives of the area. On 23.12.1996 the Committee visited Bhaniawala and Pathn Roh. Shri N.D. Jayal, who did not visit Pathn Roh, visited Banjarawala and Nehru Puram resettlement colony instead and met the people settled there.

The Committee Members also went to see a few catchment area sites in Bhagirathi & Bhilangana valleys on 20.12.1996(AN) & 21.12.1996.

Ms. Anna Malhotra visited the Old Tehri Town, New Tehri Town, Submerged Villages, Resettlement Colonies of Raiwala from 19th to 23rd March, 1997 and met DMs, Tehri/Dehradun and Commissioner, Garhwal.

The representations received by the Committee, 491 in numbers, were gone through. A few representations were also received afterwards by the

CHAPTER - II

Chairperson Based on these representations, issues were framed by the Committee, which were discussed in subsequent meetings. The broad issues which were discussed by the Committee are

- Rehabilitation Aspects
- Environmental Aspects
- Employment/Self Employment/Income Generation Schemes
- Institutional Mechanism

1.6 ACKNOWLEDGEMENT

The Committee is grateful to the officials/experts for making themselves available for presentations/discussions at its meetings.

The Committee is thankful to Commissioner, Garhwal and District Administration of Tehri, Dehradun & Haridwar for providing necessary help to the Committee during its visit to the submergence area, resettlement sites and catchment area.

The Committee is also thankful to Shri Raman Mehta & Ms. Vishaish Uppal for the analysis made of the oral representations of the people made before the Committee during its visit in December, 1996 and Shri Amardeep & Shri Vinay Gupta for preparing the analysis of 491 written representations received by the Committee. This helped the Committee in the framing of issues for consideration.

The Committee is also thankful to THDC for servicing the Committee to its full satisfaction and for providing necessary information and other help as and when desired by the Committee or by the individual Members for their consideration. In particular, the Committee would like to place on record its deep appreciation of the commendable work done by its Secretary , Shri D.P.S. Lamba and his staff in providing prompt and efficient secretarial assistance.

II - REHABILITATION

II.1 BACKGROUND

The construction of the Tehri and Koteshwar dams will result in the formation of two lakes having a spread of 42 Sq. Kms. and 2 65 Sq. Kms respectively at full reservoir levels. The Tehri dam will submerge Tehri town and 22 Villages; a further 74 villages will be partially affected. Out of this, Tehri town and 15 villages will get affected in the first phase connected with the construction of the Coffer dam, while the remaining areas will be affected in the second phase, i.e., when the impoundment of water takes place. In addition, 2 and 14 villages respectively will be fully and partially affected because of the construction of Koteshwar Dam. Besides, 13 villages are affected by the construction of New Tehri Town (NTT), project works and colony. In all, the Tehri power complex will affect a total of 37 villages fully and 88 villages partially, and the Tehri Town.

Upto June 1989, the project was being implemented by the Government of Uttar Pradesh. For taking major Policy decisions connected with rehabilitation of the displaced, a high powered Tehri Control Board (TCB), headed by Chief Minister, U.P., and including the Ministers of Impation, Power, and Hill Development, Chief Secretary, Secretaries of Planning, Irrigation and Power, and heads of various departments concerned, was constituted in 1973. A Standing Committee of Tehri Control Board, headed by the State Minister of Irrigation, was formed in 1978. The Rehabilitation Policy was evolved by the Two separate policies, one governing the Urban rehabilitation and the other governing the Rural rehabilitation, were evolved by the State Government over a period of time for resettlement and rehabilitation. The selection of resettlement locations was also done by the GOUP. The rehabilitation process commenced in 1976, and by early 1997 roughly half of the total affected families had been displaced and relocated. All aspects of rehabilitation work were being managed by Commissioner, Garhwal Division, assisted by Director, rehabilitation (an IAS officer) who was the controller of all the departments related to displacement, resettlement and rehabilitation, i.e., land acquisition, PWD, Administration and six irrigation divisions. Thus, the Director had access to all departments responsible for land acquisition and payment of compensation, shifting of people, allotment of agricultural lands and houseplots, creation and maintenance of community infrastructure. and redressal of grievances.

The Tehri Hydro Development Corporation (THDC) was formed in 1989, and rehabilitation work was transferred to the Corporation in 1990. The THDC adopted the Rehabilitation Policy evolved by the Government of Uttar Pradesh (GOUP). The THDC also inherited the NTT and rural resettlement colonies established earlier by the Project Administration under the State Government.

After the transfer of the project to THDC, as a joint venture of the Government of India (GOI) and the GOUP, it has assumed full responsibility for the further evolution of the R&R Policy and its implementation. However, the full participation of the State Government departments at all levels is absolutely essential for the proper implementation of displacement, resettlement and rehabilitation activities. Areas in which the State Government departments continue to be directly involved include the following:

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- Acquisition of land and properties in affected villages and Old Tehri Town, as per the Land Acquisition Act, on submission of proposals by the Project Authorities.
- Assessment of compensation payable for the land and structure acquired, as per the Act and disbursement directly to the concerned persons, after the announcement of awards by SLAO
- Compensation for trees are decided by the State Forest Department/Horticulture Department.
- District administration is the competent authority to settle the grievances related to payment of compensation or any other disputes related to assessment under the Act.
- Settlement of disputes/claims for rehabilitation benefits within the cut-off-date and the Policy provisions.
- Allotment of agricultural land, residential plots, flats and shops etc. are made by a Committee having representatives from the THDC, District administration and public representatives.
- Matters related to Law and Order, Flood Control arrangements, and Eviction/Evacuation are also handled through the District administration.
- Agricultural land required for rural rehabilitation and resettlement colonies are negotiated through the District Authorities concerned, as per the directions and control of the Coordination Committee.
- Declaration of resettlement colonies as revenue villages is also done by the State Government.
 Facilities created at various colonies are to be handed over to respective departments of the State Government for their future upkeep and maintenance.

Thus, without the full participation of State Government departments, R&R work will not proceed move smoothly. For the purpose of co-ordination amongst various State Government agencies and the THDC, a Co-ordination Committee (CC) under the Joint Chairmanship of Commissioner, Garhwal and CMD, THDC, was constituted by the State Government on 26-5-1990. District Magistrates of Tehri, Uttarkashi, Hardwar and Dehradun, and officers of THDC and the State agencies concerned are Members of the Committee, besides President of Zilla Parishad, Tehri, and President of Nagar Palika, Tehri.

The State Government has recently appointed an Additional Director, rehabilitation cum Special Secretary, Revenue, with headquarters at Dehradun, exclusively for supervising work related to land acquisition and rehabilitation aspects. This may facilitate better coordination and hasten the pace of rehabilitation activities. This issue is dealt in detail later in this Report. (See chapter on 'Institutional Mechanism')

In 1995, the THDC introduced a number of provisions without altering the basic elements of R&R Policy. The existing Policy of THDC is attached in *Annex II.1(i) & (ii)*. The facilities said to have been provided in the resettlement colonies are indicated at *Annex II.2*.

All the rural resettlement colonies relating to phase I rehabilitation were set up by the State Government, and THDC did some development work in seven colonies. For rehabilitation work relating to phase II, land is being acquired by THDC. About 447 families belonging to phase II have been shifted to existing colonies or received cash compensation.

Extent of Families Affected

List of families that had land and/or house were available from LAO records. No baseline survey was conducted. Thus, only those households with land and/or house are entered in LAO's revenue record. Families that are landless and houseless may not be in LAO's record

Rural Families: A total of 4909 and 3998 families respectively are fully and partially affected due to the construction of Tehri dam (Stage-I of Tehri Power Complex). Further, 103 families are fully affected and 280 families are partially affected due to construction of Koteshwar Dam. The current Policy recognises the head of landless agricultural labourer families as affected and confers same benefits as those of fully affected families, in case they belong to fully affected villages.

EXTENT OF AFFECTED FAMILIES UNDER CURRENTLY USED CUT-OFF DATES TO DETERMINE ELIGIBILITY (Rural: Section 4(1) notice; Urban: June 1985)

CATEGORY	Tehri Dam & HPP	Koteswar Dam	Total
RURAL			
(Cut-off date: Date of section 4(1) notice) Families Fully Affected			
By Submergence Project Colony and	4226°	103	4329
construction of New Tehri Town	683°		683
Total	4909	103	5012
Families Partially Affected	3998	280	4278
Total Rural Families Affected	8907	383	9290
URBAN			
(cut-off date for determining eligibility: June	1985)		
Families Affected	5291		5291
Total Families Affected			020.
(a) Fully Affected	10200	103	10303
(b) Partially Affected	3998	280	4278

 2064 rural families from 28 fully affected villages in the first phase, and 446 families from second phase have been given rehabilitation provisions upto March 1997.

	Tehri dam	Koteswar dam
Number of villages fully affected:	35	2
Number of villages partially affected:	74	14

The State Government had acquired about 4100 acres in 16 clusters for the resettlement of the affected families, when it had direct responsibility for rehabilitation of affected families. After taking over rehabilitation, THDC has initiated land acquisition proposals for about 2800 acres of agricultural land for resettlement of rural families in the Districts of Dehradun and Handwar. Since affected families have been asking to be resettled mainly in Uttarakhand areas, efforts are being made to acquire land in Dehradun District. However, search of land has been extended to Handwar District also

THDC has initiated land acquisition proposals for 104 villages, out of the total of 125 villages. In the remaining villages, acquisition process is yet to be initiated. As of December 1996, lands and houses in 30 villages have been acquired, and the proposals for the remaining are at various stages of processing/sanctions.

ii) Urban Families: The entire Tehri town will be submerged in the reservoir. This has significantly increased the number of people displaced by the project. The cut-off date for deciding eligibility to receive rehabilitation benefits has been fixed at 6.06.1985. According to a list finalised in 1989, about 3500 families were to be rehabilitated, in addition to provision of accommodation to State Government / Semi-Government employees residing in old Tehri Town. The number of urban families to be rehabilitated now stands at 3686, excluding U.P. Government/Semi-Government employees. The details of eligible families is Owners of house and land on which house structure erected -2035, Benap House Owners -384, Tenants - 442, Government employees resident in Tehri town - 1605, Institutions/Bank/Central Government employees - 653, Others - 172, All categories -5291.

II.2 METHODOLOGY FOR THE REVIEW OF REHABILITATION ASPECTS

Meetings

The Committee had a wide range of meetings with all concerned, and examined documents made available relating to the rehabilitation aspects. There were meetings with:

- people in resettlement sites, affected villages, Old Tehri Town, New Tehri Town, and public places (people were met in groups in public places, as well as in their houses);
- Government of Uttar Pradesh and THDC officials connected with land acquisition, resettlement and other rehabilitation aspects; and
- elected representatives of the people.

One member of the Committee met the World Bank officials in New Delhi dealing with rehabilitation issues.

Visit to Project Area

All members of the Committee visited the OTT, NTT, villages in Bhillangna and Bhagirathi valleys, and various rural resettlement colonies from 19th to 23rd December and heard various sections of the people and took their written representations.

In January 1997 (17 to 21), Prof. Parasuraman along with a team of researchers visited a few villages not covered by the Committee during December visit.

In March 1997, Mrs. Anna Malhotra visited the resettlement sites and affected villages. Mrs. Malhotra held extensive discussions with GOUP and THDC officials on an appropriate administrative set-up to carry out R&R activities successfully to provide maximum advantage to the affected people.

Analysis of Oral and Written Submissions

On the basis of oral representations made to the Committee during its visit in December 1996, a report was prepared by Shri Raman Mehta and Ms. Vishaish Uppal (Annex II.3).

In response to Committee's request for written representation made through local newspapers, 491 representations were received. Mr. Amardeep and Mr. Vinay Gupta prepared a report based on the written representations (Annex-II.4).

On the basis of these representations, Committee framed the issues for deliberations at length, considering the criteria brought out herein after.

Analysis of R&R Policies of other large scale projects

The Committee considered following R&R Policy documents prepared by State Governments, Government of India and the World Bank's R&R Guidelines.

- Draft National Policy on rehabilitation (by GOI);
- rehabilitation package of Madhya Pradesh, Maharashtra, and Gujrat, NWDT Award, for Sardar Sarovar Project;
- R&R Policy documents of other projects such as Ranjit Sagar, Upper Krishna Project, Upper Indiravati Project;

The Committee had access to all Government Orders issued by GOUP from 1972 onwards. The latest GO was issued by GOUP in February 1996.

The Committee reviewed:

- Socio-Economic Study conducted by the Administrative Staff College of India (ASCI) on Tehri Project;
- · fact finding Study conducted by Uttar Pradesh Voluntary Health Association, Lucknow

Identification of Issues

Based on the meetings, visits, and review of documents, the following issues were identified and discussed at length by the Committee.

- · Definition of family
- · Cut-off-date for rehabilitation benefits
- Amount of land given as rehabilitation provision:
- · Differences in compensation rates paid at different times
- Size of Plots to be given for house construction
- Tenants and shopkeepers were given shops; whereas their owners, who were not running shops, got only compensation and not the shops
- Increase in rates of cash grants for shifting, seeds, fertilisers etc.
- R&R provisions for affected people in Partially Affected Villages
- Employment for one member from each family
- · Compensation for business loss (pagri)
- Land Titles for allotted plots
- Free construction materials
- Suggestion that rehabilitation work should be under a senior IAS officer.
- Allegations of corruption in payment of compensation and allotment of houseplots and agricultural land
- Implementation of Self-employment/Income Generating Schemes
- Award of Petty contracts to affected persons
- Compensation for trees
- Compensation for community property
- Hak-Hakook (customary rights)

II.3 PROGRESS IN LAND ACQUISITION

Tehn Dam Project was envisaged by Government of Uttar Pradesh (GOUP) in 1972. In order to avoid infiltration of outsiders to obtain land and claim for rehabilitation benefits, GOUP issued notification limiting transfer of lands. The GOUP ordered that "those rural families who had after 8th September 1976 acquired land less than 1 acre in the affected areas by way of agreement, gift, collusive suites etc., and those families who had after 5th March 1978 acquired land less than 2 acres in the affected areas of Tehn would not be entitled for allotment of land under Rehabilitation Policy. Similarly, those rural families who had after 5th March 1978 sold their land holding, and kept only a balance of less than 2 acres with themselves would not be entitled to allotment of land in terms of Rehabilitation Policy" (English version of GOUP orders issues in Hindi).

Land acquisition (section 4 (1) notifications) for the *first phase* of the project started in 1979 and continued until 1992. Section 6(1) notifications started in 1980 and continued upto the end of 1994.

Land acquisition process has been initiated in case of villages coming under second phase. In this phase 56 villages in Bhagirathi valley (4 full; 52 partial); 25 villages in Bhilangana valley (3 full, 22 partial), and 16 in Koteshwar valley (2 full, 14 partial) are to be acquired.

Major issues emerging from analysis of land acquisition process:

1 In all, 125 villages will be affected: 37 fully and 88 partially affected. So far, notification for land acquisition has been done in about 85 villages. Land of 40 villages is yet to be notified for acquisition. In two villages in phase I, final award is yet to be given by SLAO, though on-account payment upto 80% has been made and land allotments to affected families given in resettlement colonies.

The land acquisition process, i.e., notification of section 4(1) of Land Acquisition Act started in 1979 continued till 1995, introduced serious confusion among the people. The value of the lands appreciated significantly over a period of time. For land acquired in 1979 as per provisions of the Land Acquisition Act., compensation was paid to the landowners at the rate of Rs 452 to Rs 1080 per *nali* (20 nali constitute an acre). The lands which are yet to be acquired will be paid much higher rate. For various type of land, the amount paid in 1996 range from Rs 7,000 to Rs 27,000 per nali depending upon the type of land. Therefore, lands acquired over a period of time has created a serious situation, as lands acquired for the same project of the same area is being paid at different rates.

2. In terms of level of compensation paid for the lands and houses acquired in the villages affected in the first phase, the distribution is as follows (1979 to 1989):

Level of compensation (in Rupees)	No. of families (%)
< 20,000 20,000 - 40,000 40,000 - 100,000 100,001 and above All	1092 (49.9) 493 (22.5) 415 (18.9) 191 (8.7) 2191 (100.0) Empensation paid: Rs 44,423

About 50 percent of the families received less than Rs 20,000 as compensation of house and land in the original village.

Tehri Town: Between 1983 and 1989, 1096 families in Tehri Town were paid compensation for house, land on which house stood, shops and other properties. The distribution of families by amount of money paid is given below.

Tehn town (1	1983-89)	
Level of	No. of families	(%)
compensation	· · · · · · · · · · · · · · · · · · ·	(70)
(in Rupees)		
< 20,000	327	29.8
20,000 - 40,000	122	11.1 ²
40,001 - 1 lac	369	33.7

I I and owning families and landless agricultural labour families in fully affected villages, and fully affected families in partially affected villages are referred in this report as *entitled fully affected families*. These fully affected families are entitled to rehabilitation provisions, in addition to 2 acre land

100,001 - 2 lac	176	16.2
200,001 - 5 lac > 5 lac	88	8.0
Total	14 1096	100.0

In oral submissions made by people during the team's visit to project affected villages and rehabilitation sites, as well as in written submissions received, people invariably complained about the level of compensation paid. There were number of complaints about corruption in assessment of value and payment of compensation money. The complaints fell into following categories:

- Inconsistency in valuation of lands of similar quality;
- Very low value paid for trees of immense value;
- Non-valuation of CPRs that contributed significantly to the economic and social wellbeing of families;
- Cuts taken while disbursing compensation amount.

Trees were valued very low. Fodder trees such as Bhimal (Grievia), leaves of which are the most nutrious scarcity season fodder, and its bark is a very strong fibre used for ropes and mats were not considered for valuation at all. The committee recommends that valuation of trees be made taking all its uses and number of years of benefit from a tree into account.

While the issue of corruption was not within the purview of the Committee, nor was the Committee in a position to investigate the incidence of corruption, it would not be proper for the Committee to ignore the fact that throughout its visit to the project area, the villages in the submergence area and the resettlement colonies, complaints about corruption at various stages in the process of displacement and rehabilitation formed a recurring theme in the representations made to it. The Committee would like to draw the Government's attention to this widespread perception and recommend that the Government should appoint a Committee to examine the incidence of corruption, and then take prompt remedial action.

- 3. Evidences from official records, submissions made by the people, and information collected by the team members during field visits reveal that families whose lands were acquired prior to 1991 probably had less favourable treatment compared to those receiving compensation after 1991. It may have something to do with timing of acquisition of lands. The Circle rates registered significant increase in the 1990s, and most families receiving compensation also made swift shift to rehabilitation villages. Thus, many families that received compensation after 1990 were able to invest the money in productive assets. Besides, such families received improved rehabilitation benefits. In fact, those who shifted recently received Rs 15,000 as incentive grant to shift, in addition to Rs 5,000 given as grant to shift household effects. The families (and they constitute the majority) that received compensation in the early 1980s and shifted to rehabilitation sites in 1980s and early 1990s have expressed serious dissatisfaction.
- 4. Families whose lands were acquired in the late 1980s and early 1990s also benefited due to delayed land acquisition and shifting. Given the fact that land transfers were frozen in 1976, legal transfers were possible in situations such as (i) death of patriarch on whose name land records existed, (ii) effect transfer to legal inheritors through affidavit before a magistrate. The chances of first option materialising depended on the life-cycle stage of the family, and the second option could be exercised by those with information and influence. This had significant impact on the extent of rehabilitation benefits received by the members of families.

It was also brought to the knowledge of the Committee that the land and other property owned in the original village have been acquired, and the ownership rights not conferred to them over the land where they have been settled.

II.4 CURRENT DEFINITION OF LAND, AFFECTED FAMILY AND PRIME REHABILITATION BENEFITS

The existing resettlement and Rehabilitation Policy applicable to Tehri project affected families has not defined 'land', 'oustees' and 'family': However, examination of R&R Policy yield definition as given below:

Definition of Land: The expression 'land' has got same meaning as defined in Land Acquisition Act 1894, which includes benefits to arise out of land and things attached to the earth or permanently fastened to anything attached to the earth.

Definition of 'affected': An affected shall mean any person who on the date of publication of the notification under section 4 of the Act, has owned land and / or house or engaged in agricultural wage labour in the area likely to be submerged permanently or temporarily. In case of urban areas, apart from land/house owners, tenants and benap house holders residing in Tehri Town as on the cut off date of 6.06.1985 will constitute the affected population.

Definition of 'Family': The existing Policy of THDC does not define the term family as such. However, for purposes of entitlement of rehabilitation benefits to land owners, family is represented by the head of the family, in whose name the land is entered in the revenue records as on the date of Section 4(1) notification, and includes all members dependent on him.

Eligibility to Receive rehabilitation Benefits: Current Situation

- (i) Fully Affected Villages: All landed families, and among landless families those dependent on agricultural wage labour were eligible to receive 2 acre land as prime rehabilitation provision. Those landless families not dependent on agricultural wage labour (even if they are artisans fully dependent on agricultural families losing land) were not eligible for receiving 2 acre land.
- (ii) Partially Affected Villages and Partially Affected Families: Affected families under rural rehabilitation are categorised as either 'fully affected' or 'partially affected'. The families whose 50% or more land is being acquired are being treated as 'fully affected'. Those whose less than 50% land is coming under submergence is being acquired are categorised as partially affected and are not to be settled at new rehabilitation sites. For determining the entitlement as 'fully affected', or 'partially affected', weightage would be given for the type of land holding to 'the extent of 1:1.5:3 for class II (unimigated), class I (unimigated), and irrigated land, respectively.

The 'Fully Affected Families' in 'Partially Affected Villages' are treated similar to the affected families in 'Fully Affected Villages' and given land as prime rehabilitation benefit.

Partially Affected Families are given cash compensation for land coming under nergence or allotted alternate land taken over from fully affected families. Further, they be given submerged reservoir land on patta, on a nominal rent, during the low rooir level period, for temporary cultivation."

ages where 75% or more families are treated as fully affected, the remaining partially cted are also treated as fully affected subject to the condition that they would be tled to payment of cash compensation for their entire holding as per norms licable to fully affected families and would not be entitled for allotment of land, and alld also get other compensations as settled norms viz., compensation for house ictures, shifting and incentive grant, cash for seeds and fertilisers" (Rehabilitation icy, THDC, October 1995).

nclusion: According to current estimates, there are 74 partially affected villages losing ne or most of the lands under cultivation. The density of population per acre of tivable land was high even before the project started acquiring cultivable and forest ids. Submergence of significant proportion of cultivable and forest lands in the area will rease pressure of population on lands left out. The affected landed and landless nilies which depended on lands for livelihood will find it extremely difficult to earn a shood from the lands left unacquired. Such high pressure of population on reduced nicultural lands will result in environmental degradation. It would be essential to suggest ays of reducing population pressure on agricultural and forest lands.

shabilitation Package - Urban Displacement

The prime rehabilitation benefits available to the displaced families in Tehri town are:

- (i) Displaced entitled families of Tehri town are given choice of being settled either at New Tehri Town, Dehradun, Rishikesh, or Hardwar where new colonies have been developed for this purpose;
- (ii) Land owners, including Nazul land holders of the Tehn Town are given residential plot of 60 to 300 sq.mt. in proportion to their holding in the Old Tehn Town. Displaced families are giv plot of a size equal to or higher than the one which an oustee was having in Old Tehn To restricted upto 300 sq. mt. Each entitled family is given one residential plot regardless of numb houses/plots owned in OTT;
- (iii) Tenants living in OTT as on 06.06.85 would be entitled to get flats/group houses on payment of cost;
- (iv) Benap house owners who had constructed their houses before 06/06/85 are allotted plots/flats on payment of cost;
- (v) Shops have been constructed by THDC in NTT and other rehabilitation sites, and are allotted to those oustees who were running the shops in OTT as on 06/06/85, on payment of cost. If the person running the shop is not the owner of the shop, the former but not the later is entitled for getting shop at NTT. The shop owners were paid compensation for the land and structure.

The rehabilitation provisions as evolved by GOUP for the displaced in Tehn Town differed for various categories of population in a number of ways. It seems that GOUP was not following many of its own GOs even while it was in charge of rehabilitation of affected people in Tehn town. Each of the initial GOs with favourable provisions to the affected were withdrawn at later stages.

11.5 RATIONALE FOR REDEFINING REHABILITATION POLICY

Definition of Family and Eligibility to rehabilitation Provisions

There are two critical factors in facilitating proper rehabilitation. They are definition of family', and 'cut-off date' to recognise family. It means that once definition of family is agreed, a decision on cut off date to recognise family should be agreed. Thus cut off date is the most significant problem which needs to be tackled, as it would decide the number of additional individuals becoming eligible to receive rehabilitation benefits. At this point of time, for the rural rehabilitation the cut off date is section 4(1) notification and in case of urban rehabilitation the cut off date is 6/6/1985.

In case of entitlement to rehabilitation provisions, only the head of the family with land has been made eligible to receive rehabilitation benefits. Among the landless agricultural labour families, only the head was entitled for rehabilitation provisions. All other members have been included as part of the family represented by the head. The implications of this definition are already serious and they assumed greater significance because of the time factor. In families whose lands have been taken away, only the head received rehabilitation benefits, even though many married adults have existed at the cut-off point or emerged prior to issuance of section 4(1) notice. Young and adult men (say, siblings and sons) living with land or house owner at the cut-off point (8 September 1976) would not have become eligible for compensation benefits, if the land or house owner stayed alive at the time of issuance of section 4(1) notification. In the meantime, many of these men would have had children of their own, and probably had major sons at the time of their relocation. However, none of them would have become eligible to receive rehabilitation provision. On the other hand, if death of the land owner preceded the date of issuance of section 4(1) notification, all legal heirs would have become eligible to receive rehabilitation provisions.

The definition of family *left out* individuals, with legal entitlement to land held in the name of the head, from becoming eligible to receive rehabilitation benefits. At the same time, the critical factor "death" of the head of the family prior to declaration of section 4(1) made individuals with legal entitlement to land belonging to such families to become eligible to receive rehabilitation provisions. That is, one section of the displaced population received additional benefits, while another group of families that did not experience death of the head of the family did not become eligible to receive additional rehabilitation provisions. In a project where rehabilitation work is taking place for over two decades, with only half of the number of affected population has been shifted to new location by 1997, the sense of deprivation is heightened among the affected people.

Economy and Society: In the Tehri Garhwal region, available lands and scope of expansion of such lands were limited by topography. People had traditional rights over the forest for collection of fuel, fodder and minor forest produces. Though the lands located at higher elevations were degraded and less productive, most of the fully affected villages had fertile and highly productive lands located in Bhagirathi, Bhilangana, and Koteshwar valleys. The average amount of cultivable land owned by affected families is around one acre. But forest resources greatly complemented income from agricultural activities. Since there was no baseline survey covering all families in villages slated for land acquisition, the extent of landlessness among the families is not known. However, the level of landlessness was low.

Besides support from agricultural lands and forest, most families received significant economic contribution from family members working outside the Tehri region. Most families had one or more male members working elsewhere in the country. The migrants were employed in Indian Army, and in other parts of Uttar Pradesh, Delhi, Punjab and other areas in North India. The Tehri Garhwal residents considered male centered out-migration as one of the ways to prevent division of scarce cultivable land and supplement income from cultivation. The social organisation in Tehri Garhwal region was conducive for male centered migration. The women shouldered economic responsibilities and played a major role in social domain in the villages. The women along with children and aged men stayed back in the village, while adult men visited several times in a year. The social security women enjoyed in the villages provided greater opportunity for men to move out in search of livelihood. The economic well-being of the families should be viewed within the context of social and economic organisation of the society. The value of agricultural lands, forest and out-migration in determining economic well-being of the families is context-specific. Move to another location outside the current social, economic and ecological space would necessitate new chemistry of sources of livelihood. The currently existing sources of livelihood may become redundant. In the new social and ecological location, behaviour of men and women may undergo change thereby redefining capacity of men to move out in search of livelihood. It is in this context that rehabilitation package should be reconsidered.

Case for Redefining rehabilitation Package

- 1. Much of the development work involving land in villages came to a halt with the Government order freezing land transaction in 1976. Peoples access to institutional credit, agricultural inputs and Government supported land and water development initiatives came to a complete halt in 1976. Peoples access to other forms of credit keeping land as collateral was also restricted. Sale of land to meet social and economic emergencies entailed loss of access to rehabilitation benefits. The nature and extent of uncertainty in the social and economic lives of people were intensified due to undue delays in land acquisition, payment of compensation and honouring of rehabilitation entitlements.
- 2. In almost all villages, people who received compensation between 1979 and 1989 felt that the level of compensation paid for their land and house was very low. About 50% of the families received less than Rs 20000 as compensation for house and land in addition to 2 acres of land alloted in resettlement colonies. Long delay in relocation to new area could mean utilisation of the compensation money for consumption and meeting social emergencies, rather than making productive investments. In the absence of institutional mechanism to facilitate families to invest compensation money on productive initiatives, most families may not have benefitted from the money given to them.
- 3. Many people said that they required a long gestation period to bring land provided in new location to productive form. Given the fact that people did not receive any subsistence allowance to survive the transition years, they toiled in original village as well as new area to generate income. In many families, men returned to take up cultivation in new sites, while women continued with the cultivation in old village. In a few families, where men could not return to take up cultivation, land in the new village was given on share-cropping. For most families, the transition period, spanning several years, had been extremely traumatic.
- 4. Families grew rapidly in the past 20 years all over Uttar Pradesh. Lower level of mortality in U.P. Hill areas compared to other regions of Uttar Pradesh left the family size in the project affected areas relatively larger.

As Stated earlier, agricultural land, cattle and livestock, forest resources, and remittances from men working elsewhere provided a large economic base in the familiar social and

ecological context. Displacement removed men and women from conducive social and ecological context thereby completely redefining social and economic organisation in new area. People Stated that the migrant men returned home to provide security to women in the new area thereby eliminating income earned by them. The social context of old area that provided for extended families (and security of women) became irrelevant in the new area, giving rise to a number of nuclear families. Thus, the economic insecurity has widened. Individual families require separate resources to subsist.

All these factors provide a strong basis for redefining family and rehabilitation benefits.

Experience from other Projects

The Resettlement and rehabilitation entitlement experiences of people affected by large and medium reservoir projects in the country have been uneven and hetrogeneous. In the absence of a uniform R & R Policy, the State Governments in most cases have designed their own Policy. These would differ in content for different projects. Thus each State would have it's own Policy guidelines which would change for different projects in different points of time. With each project, the scope of entitled categories as well as the nature of entitlement has changed. Increasing emphasis towards a uniform R & R Policy has led to the incorporation and consolidation of the alterations in the earlier Policy guidelines, towards creating a general Policy applicable to the later and forthcoming projects. Many cases exist where the rehabilitation work of earlier projects had reached some stage of completion, the incorporated changes in Policy were made applicable retrospectively and entitlements redefined accordingly. The Policy changes generated many more entitlements which were honoured sometimes decades after displacement and resettlement had taken place.

Examination of resettlement and rehabilitation policies developed and implemented by various State Governments and Public Sector Undertakings (Annex II.5; and Sardar Sarovar Project Affected Peoples Resettlement and Rehabilitation Policy in Annex II.6) are as follows:

- Almost all large reservoir based irrigation and power projects and thermal power projects funded by the World Bank have provided significant level of fresh rehabilitation benefits several years after completion of work on the project and closing down of rehabilitation activities (e.g. Maharashtra Imigation II Project, Orissa Imigation Project). In order to be eligible to receive further loans to develop new projects, the World Bank asked the Government and Public Sector Undertakings to rehabilitate the people already displaced and relocated elsewhere with fresh R&R benefits. The State Governments and Public Sector Undertakings traced displaced people in order to provide them new R&R benefits, which included land and grant for self-employment;
- Resettlement and rehabilitation Policies recently developed and implemented by various State Governments (Madhya Pradesh, Gujarat, Maharashtra, Orissa, Kamataka; Draft National Policy developed by the Government of India) have redefined 'family' to treat all adult members as separate families, particularly major sons. In Maharashtra and Orissa policies, in addition to major sons, major unmarried daughters are also recognised as independent families.
- Almost all reservoir based imigation and power projects, and thermal power projects funded by the World Bank that are under various stages of execution have retrospectively provided significant level of fresh rehabilitation benefits (revised R&R Policy evolved when the main project was being implemented and making it applicable

to rehabilitation of all future displaced people) several years after shifting a section of displaced people. In all such projects redefinition of family included major sons and major unmarried daughters as separate families. The newly recognised families retrospectively received provisions under revised Rehabilitation Policy(e.g. Sardar Sarovar Project, Upper Krishna Project, Rengali Multi-Purpose Project in Orissa, etc.).

Enlarging definition of family to include other adult members in the family, particularly major sons and major unmarried daughters, revising R&R Policy to include progressive livelihood facilitating and sustaining measures, and making such measures applicable to families displaced already, and those who will be displaced in the future have become essential part of implementing development projects in the country. All these measures substantially increase the cost of rehabilitation. However, genuinely good Rehabilitation Policy normally motivates people to move out at the earliest thereby facilitating execution of the project swiftly in a short period. It can be easily shown that cost incurred in implementing better rehabilitation provisions would be several times less than project cost escalation resulting from delays in implementation caused by agitation of affected people.

The THDC representative in the Committee consistently held the following position on the question of enlarging definition of family :

- Rehabilitation Policy evolved for Tehri Project, initially by the State Government and subsequently adopted by THDC, is based on family as one unit, and entitlement for rehabilitation benefits is related to the ownership rights as per revenue records; compensation/rehabilitation package had been formulated based on the premise that land owner represents his full family, of which he is the head. Accordingly, with a view to provide adequate means of sustainance to the family after resettlement, minimum of 2 acres of imigated agriculture land was assured for each family as against the average holding in the area of less than 1 acre. There is adequate compensation already being provided to these families and, therefore, there is hardly enough justification to enlarge the scope of family at this stage of project execution.
- Enlarged definition of family, as recommended by the Committee, also covers landless agricultural labourers of full submergence villages. As per existing Policy, landless agricultural labourers of full submergence areas are also allotted 2 acres of irrigated agriculture land each, which is considered more than adequate for maintaining a decent standard of living. Enlargement of family definition in their case is also without enough justification.
- The rehabilitation package for Tehri Project is, on an overall basis, much better than most of rehabilitation packages evolved for other imigation/hydel projects in the country. In this connection, THDC circulated the comparative cost of rehabilitation of Sardar Sarovar and THDC Projects (Annex.-II.7). Further, THDC also pointed out that on comparison (Annex.-II.8) while some projects do not recognise major sons as separate family, some others who do recognise have, however, granted much less benefits (between Rs.20,000 to Rs.25,000/-) as against the amounts of Rs.1,50,000/- / Rs.75,000/- recommended by the Committee. In other projects (except Maharashtra which recognise major unmarried daughters as separate families and provide benefits equivalent to half unit) major unmarried daughters are not recognised as separate families. Therefore, as per THDC, precedents also do not project a uniform set of norms to support Committee's recommendation.

Change of family definition at this stage would not only mean heavy financial implications, but would also create problems of identification of additional members of family. This may open up issues particularly in relation to settlements completed many years back. This identification would be based on adhocism. This might also have implications for future projects and may give scope to malpractices.

THDC representative accordingly suggested to the Committee that since the rehabilitation package already permits attractive compensation, there should be no need of redefining the family, and even if it is to be done, some reduced quantum of ex-gratia amount could be suggested to major sons and major unmarried daughters.

The Committee considered the points raised by THDC representatives but felt that there are economic, humanitarian and social grounds which justify change of family definition for R&R purposes.

In regard to grant of assistance for house construction in urban rehabilitation (at the recommended rate of Rs.60,000/-), THDC representatives felt that assistance in the event of enlargement of family definition should be restricted to each major married son, instead of including major unmarried sons and major unmarried daughters. They also pointed out that most of the major unmarried daughters, as on 19.7.1990, would have already been married by now, and therefore, grant of house assistance to such married daughters would bear no justification, as they are no longer part of the oustee family; even if house construction assistance is to be allowed to major unmarried daughters, it should be extended to those who are still remaining unmarried on the date of settlement as per the new package.

The Committee considered the views of THDC representative on this issue and decided to recommend grant of assistance to all major sons, married and unmarried, and major unmarried daughters as on 19.07.1990.

Resettlement and rehabilitation Package of Tehri Hydro Electric Project and Case for Change

In 1976, when the Government of Uttar Pradesh was formulating a package for resettlement and rehabilitation (R&R) of people displaced by Tehri Hydro-Electric Project, there were not many good examples to follow. In 1976, Government of Maharashtra (GOM) came out with a Rehabilitation Policy. The GOM's Policy offered 2 acre land to the landed in lieu of 75% of the compensation money, and 1 acre land to the landless agricultural labourers. Resettlement was effected in command area of the project. The GOUP package was an improvement of GOM package to the extent that both landed and landless received 2 acre irrigable land. GOM's package also had the option of families moving out with compensation money for land to settle in places of their choice. In most other aspects GOM and GOUP packages had comparable elements.

Much of the complications related to R&R aspects in Tehri project can be traced to two basic problems: (i) Unduly long time taken to accomplish rehabilitation work. In the meantime, there was an absolute halt to all forms of development work imposed due to declaration of the area for submergence Since 1976 (when a Government

order froze all land transactions by declaring such transactions invalid for land allotment purposes) people suffered significant level of economic deprivation. (ii) Fundamental elements of the rehabilitation package did not undergo any significant change in the intervening period. Given the fact that the rehabilitation process has stretched for over 20 years without major change in the basic elements of the Policy, the grievances of the affected people have multiplied. If the rehabilitation was carried out swiftly and efficiently as in Maharashtra, the situation in Tehri project may not have been as difficult as it is today. For example, in case of Dhom project (one of the five dams constructed as part of Maharashtra Imgation II Project) R&R work was completed in less than 10 years, and resettled the displaced in command area of the project (World Bank, OED, No., 1993).

While rehabilitation of people slated for displacement dragged on in Tehri project, the resettlement and rehabilitation package/Policy has undergone significant positive changes elsewhere in the country (THDC introduced some significant inducement benefits in 1995 leaving basic features of the Policy unaltered). The negative impact of displacement on economic, social and psychological aspects of individuals, families and communities were systematically documented in the 1980s, leading to demands for comprehensive improvement in Resettlement and Rehabilitation Policy at the national level. The project affected peoples' movements in most parts of the country paved way for Governments enacting progressive R&R policies.

The Resettlement and Rehabilitation Policy provisions must be viewed from the perspective of the affected people. As long as peoples interests are considered as residual and thus given least importance in planning stage, projects get affected due to non-co-operation from the affected people.

The R&R Policy for Tehn project affected people requires change. It can not remain static for over 20 years. A reasonably good package, capable of significantly enhancing the quality of life of the people, whose development was retarded for over 20 years for no fault of theirs, is required.

Overarching principles in deciding rehabilitation package

- 1. The Policy should be governed by the principle of total rehabilitation, rehabilitation would not only extend to financial compensation or providing means of livelihood but it should be multi-dimensional. It should include social, economic, environmental and cultural aspects as well. The members agreed that Policy package should be fair and should lead to improving the level of living of the affected people. The idea is to look for wide variety of measures to ensure better living after resettlement;
- 2. The aim should be to minimise hardship of displaced persons during the process of rehabilitation. Resettlement must provide for an improved resource base so that the displaced in their new place can have access to not only shelter but also food and income generating systems, communications and social infrastructure not inferior to that of their original habitat within a reasonable period of time;
- 3 The settlement site and the resource base should be large enough to accommodate the natural growth in population and to generate incomes to provide for a progressive rise in standards of living;

- 4. For smooth and effective resettlement, principle of geographical continuity, cultural homogeneity and ready adaptability must be considered in choosing and planning resettlement units and sites;
- 5. The affected people mentioned that in affected Tehni villages they had free and easy access to fodder, fuel, water, and minor forest produces. (In the affected Tehni villages, women and children spent considerable amount of time and energy in fetching water and collection of fodder, rehabilitation in the new area must address these issues seriously and reduce drudgery of women and children). However, in most of the resettlement locations people complained that fodder and fuel, and minor forest produces are not available. Thus, the displaced community must be individually and collectively compensated for all losses. This includes lands, trees, houses, community amenities and services, and access to natural resources. The approach should be to enable the displaced people and communities to reestablish in the new place as quickly as possible:
- Where the displaced are resettled among already settled communities, they
 must be resettled in such a manner that they are integrated with the host
 community on the basis of equality, mutual respect and understanding;
- 7. The displaced people must be involved in implementation of rehabilitation programme. The elected representatives are in the Coordination Committee. However, affected peoples representatives are not in the Committee. It is necessary to organise the affected people and give adequate space for their fullest participation. All phases of planning, execution and monitoring must involve the representatives of affected people.

After a thorough analysis of the situation of the people already resettled and those waiting to be resettled, the Committee arrived at the following decisions:

- The Committee should not only suggest Policy changes to provide a rehabilitation package conducive to establishing and enhancing social and economic well-being of the people to be rehabilitated in the future, but also suggest Policy changes to improve the condition of people already resettled, so as to bring them on par with better off sections of the resettled people. This might mean providing additional rehabilitation benefits.
- There was need for proper mechanisms for the implementation of the Rehabilitation Policy so as to reach the benefits to the affected people;

Some members of the Committee suggested that the following should be recognised as the just rehabilitation package for newly recognised families:

- To all recognised families affected by Tehn Hydro-Electric Project and other infrastructure related to it - head of household, major married sons, major unmarried sons and major unmarried daughters - land should be given as a rehabilitation provision. For the newly recognised families
- Major mamed sons should be entitled to receive two acres of land each;
- Major unmamed sons and major unmamed daughters should be entitled to receive one acre land each.

- If land is not available in Uttrakhand region, the newly recognised families should be provided the amount of land they are entitled to in Districts around Uttrakhand region. The families should have the right to suggest areas in which they would like to settle;
- 3. If the families do not wish to resettle in areas outside they should be given cash sufficient to buy the amount of land they are entitled to in Uttrakhand. Thus, the major married sons should be paid cash sufficient to buy two acres of land in Uttrakhand, and the major unmarried sons and major unmaried daughters should be paid money sufficient to buy one acre of land each in Uttrakhand. The cash amount payable in lieu of land will be equivalent to the amount of money required to buy land in areas where people are already resettled.

However, after considering various aspects, the Comittee decided in favour of cash option only for the newly recognised families, as outlined in the Committee's recommendations below.

II.6 RECOMMENDATIONS

I. Advance against Land to be acquired in the future

In order to avoid infiltration of outsiders to buy/obtain land and claim for rehabilitation benefits, GOUP issued a notification limiting transfer of lands. This restriction on sale of land has resulted hardships in meeting expenses related to marriage, death, disease and other occurrences in a few families. Sale of land would have deprived them of the rehabilitation benefits. Families whose lands are yet to be acquired have requested financial assistance to meet exigencies.

Recommendation: The Committee recommends that families with land may be permitted to draw an advance to be adjusted from compensation money payable at the time of acquisition of land. The PAFs should be given an advance limited to 25 % of the cost of their land holding or Rs. 100,000, whichever is less. The advance shall carry a 12% interest rate. For this purpose THDC will create a fund of Rs. 2 crores.

II. Definition of Family and Rehabilitation Provisions

The basic rehabilitation provisions (land, houseplot, and other benefits in case of affected rural families; house/houseplot, shop and other benefits in case of affected urban families) outlined in existing R&R Policy to *entitled fully affected families* will remain unchanged (Policy note is attached as annex II.1).

The recommendations outlined in this section specifically relate to the following: definition of family; cut-off date to identify individuals eligible to be termed as independent families and receive rehabilitation provisions; level of land and cash provision; and provision of houseplots, eligibility to receive constructed shop and house construction assistance in NTT. All other aspects including community provisions remain as specified in 1995 R&R Policy. The Committee recommends a new definition of family thereby enabling additional members to become eligible for rehabilitation provisions. The recommendations given below pertain only to the additional members becoming eligible to receive rehabilitation provisions.

III. Definition of Family and Cut-off date to decide Family

In case of Tehri project, the review Committee recommends a new definition of family.

All the sons and unmarried daughters of the entitled fully affected families who have attained the age of 18 years as on 19.7.1990 are recognised as independent families and will be eligible for rehabilitation provisions defined below. This cut-off date will remain in place upto 18. 7. 2002.

For those entitled fully affected families not offered rehabilitation provisions by 18. 7. 2002, the cut-off date to determine eligibility (i.e., attainment of 18 years of age) shall be reckoned as on 19.7.2002. All sons and unmarried daughters in such entitled fully affected families who have attained the age of 18 years as on 19.7.2002 are recognised as independent families and will be eligible for rehabilitation provisions defined below.

This new definition of family (recognising major sons and major unmarried daughters as independent families) will be applicable to all fully affected families: to those fully affected families who have already been displaced and shifted to new area or awaiting shift to new area; as well as those awaiting displacement and resettlement in a new area.

Level of entitlement to rehabilitation provisions:

- The married major sons are considered as full units to receive rehabilitation provisions defined below;
- The major unmarried sons and major unmarried daughters are considered as half units to receive rehabilitation provisions defined below.
- IV. Recommendation of rehabilitation Provisions for Newly Recognised Families of original Fully Affected Families
- 1. Rural Families: Those Already Displaced

For past cases where family has already been shifted

 As regards past cases where the rehabilitation has already been done, for newly recognised additional families the Committee recommends that only cash amount be paid instead of land. The cash option is recommended considering lack of land available for rehabilitation. The major married sons receive Rs. 150,000 and the major unmarried sons and major unmarried daughters receive Rs 75,000.

2. Rural Families: Future Displacement Cases

In cases where family has not shifted/given rehabilitation benefits, for newly recognised additional families:

The Committee recommends that only cash amount be paid instead of land. The cash
option is recommended considering lack of land available for rehabilitation. The major
married sons receive Rs. 150,000. The major unmarried sons and major unmarried
daughters receive Rs 75,000.

One constructed shop be given on cost to a shop owner who is not running the shop. For each additional shop owned by the same person but not run by him/her, he/she will be given Rs. $40,000^2$.

(II) House Construction Assistance for Urban Families.

- (a). To all entitled fully affected families in old Tehri town, house construction assistance be paid as grant to landowners (other than benap³) at the rate of:
- Rs 60,000 to those allotted 60 sq. mt. house plot;
- Rs. 1.2 lacs minus compensation paid, subject to a minimum of Rs. 60,000, to 100 -200 sq. mt. plot holders &
- Rs. 1.8 lacs less compensation paid, subject to minimum Rs. 60,000, to 250 300 sq. mt. plot holders.

This amount will be paid in accordance with progress of construction and shifting. This provision is also applicable to those who have already constructed their houses and shifted, and those not yet shifted.

- (b). House construction assistance to each major married sons and major unmarried sons and major unmarried daughters⁴ at the rate of Rs. 60,000. Payment of this amount is linked with the progress of construction and shifting.
- (c). Since the entitled fully affected families and newly recognised additional families are given grants to make house, they will not be entitled to loan with subsidy on interest.

VII. Other Points Considered by the Committee

For rehabilitation, land may also be purchased through direct negotiations and not only through acquisition (as acquisition may lead to litigation and time consuming and entail higher cost because of payment of solatium etc.). However, as far as possible, in making private purchases through direct negotiation, it must be made sure that sufficient land is available to resettle all families from a village or hamlet together as a social unit in one place. In order to maintain social fabric, land in big chunks be purchased, so that a large number of families can be settled together.

The committee recommends that valuation of trees be made taking all its uses and number of years of benefit from a tree into account.

² In New Tehri Town, development cost for a shop is estimated at Rs. 40,000. The tenant pays only cost of the structure but not the development cost. When the owner is not given additional shop(s), she/he is given the development cost (Rs 40,000) as grant

^{3.} Benap meant encroacher

⁴ Here, definition of major sons and daughters remains the same as that defined above (III). Further, as mentioned in III, for those entitled fully affected families not offered rehabilitation provisions by 18.7.2002 the cut-off date to determine eligibility (i.e. attainment of 18 years of age) shall be reckoned as on 19.7.2002. All sons and unmarried daughters in such entitled fully affected families attaining the age of 18 years as on 19.7.2002 will be recognised as independent families and become eligible for rehabilitation provisions.

VIII. Grievances of People in Resettlement Colonies and Affected villages

A complete analysis of the grievances of the people, expressed in written and oral form in resettlement colonies and affected villages was carried out and presented in Annex II.3 and Annex II.4.

Issue of corruption: While the issue of corruption was not within the purview of the Committee, nor was the Committee in a position to investigate the incidence of corruption, it would not be proper for the Committee to ignore the fact that throughout its visit to the project area, the villages in the submergence area and the resettlement colonies, complaints about corruption at various stages in the process of displacement and rehabilitation and formed a recurring theme in the representations made to it. The Committee would like to draw the Government's attention to this widespread perception and to recommend that the Government should appoint a Committee to examine the incidence of corruption, and then take prompt remedial action.

IX Rights of People in upstream Villages over water from Bhagirathi and Bhilangana and tributaries draining in these rivers.

The Committee acknowledged the point that construction of Tehn Dam should in no way affect rights of people in villages upstream of Tehn reservoir over water from Bhagirathi and Bhilangana rivers and tributaries for drinking and irrigation purposes. These rights should be recognised and honoured. Water use for irrigation may be through lifting, construction of small dams and other methods. Any attempt to deny water to local people will be violation of their rights.

X. Operationalisation of Policy

Identification of major sons and major unmarried daughters

One of the major problem in operationalising the new definition of family anse from absence of baseline data on affected families at the time of issuance of section 4(1) notice or at any other time. However, this problem can be tackled with other data base. The household form of 1991 census is the most promising source of data. The census date is very close to the cut-off date (19. 7. 1990) to decide new families. The age, sex, mantal status of each member normally resident (including out-migrants) in the household at the time of census is available for each household. The census household composition data can be verified by a reputed independent agency. It is within the powers of the State Government to make special request to the Registrar General of India, Ministry of Home Affairs, Government of India to release household composition data.

If census household data is not forthcoming from the Registrar General of India, the Government should appoint an independent agency to conduct a comprehensive survey in all affected villages and resettlement colonies. The agency will use other databases, such as voters list, BPL survey of State Government, and others.

The Committee felt that women should share in the rehabilitation benefits given to men. Thus, the Committee recommends that henceforth all rehabilitation provisions (land house / house plot and cash provisions) should be given and registered jointly to both spouses.

CHAPTER - III

III: ENVIRONMENTAL ASPECTS

Background

In the terms of reference (TOR) for the Committee, specified by the Ministry of Power, Government of India, vide their letter No. 19/18/96 - Hydel - II dated 17 September, 1996, the third item was:

"To examine the implementation of various conditions of environmental clearance except that relating to safety aspects and design of the Tehri Dam and suggest additional or improved environmental safeguards, if any, based on data and information now available."

In its first few meetings the Committee discussed the environmental issues that follow from the TOR and, therefore, need to be examined (including the related issues raised by the

The Committee also subsequently discussed and agreed upon a framework within which these issues need to be assessed, and based on this, the Committee formulated a set of questions for the THDC and the Ministry of Environment and Forests, Government of India, which were sent to them for their response. The list of questions and the responses received are at annexure III(vii), III(ix) & III(xiii).

The Committee also examined the various documents placed before it (listed at annexure III(v &vi) had discussions among the members and with other experts and officials (listed earlier), examined the responses submitted by THDC and MOEF (copies at Annexure III(iv,ix & xiii) and visited the project site, the submersion areas, and the catchment areas, and had discussions with the local people.

III.1 IMPLEMENTATION OF THE CONDITIONS OF ENVIRONMENTAL

One of the terms of reference of the Committee was To examine the implementation of various conditions of environmental clearance*

Accordingly, the Committee assessed the implementation status of the various terms of clearance prescribed by the Ministry of Environment and Forests (MOEF), in its letter No. 2-19/81-MCT/IA I, dated July 19, 1990 read along with DO letter No. 2-19/81-IA.I dated October 11, 1993 (copies of letters annexed at annexure III (i) and III (xiii).

As per the said letters, the project was accorded environmental clearance subject to the following conditions:

- The completion of studies and the formulation of comprehensive action/ management plans by the specified dates.
- ii) These were to be to the satisfaction of, and got approved from, the MOEF.

- The completion of studies, formulation of action plans and their III) implementation to be scheduled in such a way that their execution would be pan-passu with the engineering works.
- Failing these, the engineering works were to be brought to a halt without any iv) extraneous considerations.

The Committee considered the implementation of these conditions.

Submission on time:

The Committee noted that, as per the documents brought to its notice and based on the discussions it had with the Secretary, MOEF and officers of the Tehn Hydro Development Corporation (THDC), the required studies and action/management plans were not submitted on time. The prescribed and actual dates of submission are given below:

Table III.1.1 Status of submission

Studies/ Action Plans/ Management Plans	Prescribed date of submission	Actual date of submission
Catchment Area Treatment Action Plan based on RSAC assessment	31.12.1990	January, 1994° According to THDC representatives, the RSAC report was ready by July, 1991 and was under discussion with the MOEF and the UP State Forest Department till
2. Command Area Development	31.3.1991 (31.12.1993)**	Not yet submitted by GOUP
3. Flora	May 1991	July, 1993
4. Fauna	May 1991	March
5. Water Quality Modelling Study		March, 1993
	No date specified	November, 1992
6.rehabilitation Socio Economic Study	30.6.1991	March, 1993
rehabilitation: Reservoir Rim PAP's package	31.3.1991	November, 1992
Disaster Management Plan	31.3.1991	April, 1992 ***

Also:

Prescribed date of completion	Actual date of completion
31.3.1991 (12/1993)**	Legislation not yet enacted by GOUP

** As subsequently agreed by MOEF vide their DO letter No. 2-19/81 - IA.I dated 11.10.1993

A point considered by the Committee was whether, as the construction of the project was going behind schedule, the dates for completion of studies and action/ management plans

^{***}À Disaster Management Plan was submitted to the Ministry of Agriculture, GOI, in April 1992, and comments of the MOEF were sent in June, 1992. The THDC representatives State that they had subsequently sent clarifications to the Ministry of Power. The MOEF has Stated that no revised version of the Disaster Management Plan has been received to date, but THDC States that the DMP has been submitted to the Nodal Ministry, namely the Ministry of Agriculture.

also stood extended. While the delay in construction may give some leeway for the implementation of remedial or mitigative action plans, there is no reason why the studies and formulation of plans should themselves have been delayed. Ideally these studies should have been completed satisfactorily before the project was granted environmental and economic clearance. As they were not, and as conditional environmental clearance was given, there was a critical need to complete these studies as soon as possible. In fact many of them were initiated long after the date of clearance. For the studies on flora and on fauna, for which copies of the correspondence were made available, correspondence was initiated only on 29 October 1991, with a letter each to the Director of BSI and ZSI respectively at annexure III (xxx & xxxiii), nearly five months after the last date of submission of the reports requesting them to take up the studies. The date for submission of the Command Area Development plan was extended, vide MOEF letter of 11 October, 1993, by 33 months, but it was still not submitted within the extended time frame, and, in fact, is not ready even now.

The Committee therefore concludes that, studies and action/ management plans were not completed/submitted within the time-frame laid down in the conditions of clearance.

Approval of the reports:

The Committee then went on to consider whether all the required studies and plans had now been completed and approved, even if they were not completed within the stipulated time. The Committee was told that the THDC had submitted to the Ministry of Power and, consequently, through them to the MOEF, the studies and plans indicated in table III.1.1 above.

It will be seen from this that the Plan for Command Area Development has not been submitted by the Government of Uttar Pradesh till date. Also, the setting-up of the Bhagirathi Basin Development Authority, under legislative resolution, as required in the conditions of clearance, has also not been completed by the Government of Uttar Pradesh till date. It was explained to the Committee that the UP Government had issued an administrative order for the establishment of the Authority, but this was not what the conditions had stipulated; so far as the Committee knows, the Authority has not in fact come into existence, and has not been functioning.

The Committee also noted that even where Study reports and plans were submitted, these had not yet been approved by the MOEF, as required in the conditions of clearance. It was Stated by the Secretary, MOEF, that approval must be obtained for each of these management and action plans and cannot be presumed.

The Committee therefore concludes that the condition requiring that the studies and plans be got approved from the MOEF was not complied with.

It appears to the Committee that neither the MOEF nor the THDC made the required efforts to ensure that the environmental conditionalities were fulfilled. The MOEF appears to have been unwilling to enforce the conditions of clearance. The Committee is concerned that despite so many years having passed the MOEF and the THDC could not resolve the outstanding issues. Clearly the MOEF should have settled the issue early, one way or the other. It should have prescribed for itself a time frame within which the reports being submitted by the THDC were to be examined and disposed off. Prolonging the discussion on these reports for years, while the project construction continued, is neither in the interest of environmental conservation nor of the project. By not taking timely and decisive action on the issue of approval or rejection of the environmental reports, the MOEF, in the opinion of the Committee, has been senously remiss.

Implementation:

Though the execution of the action plans were to be pan passu with the engineering works, no Statement indicating what level of environmental action would constitute as being pan passu at what level of engineering works was submitted to the Committee. This makes the Committee's task difficult. In general, the Committee found that specific recommendations for ongoing monitoring and remedial action made in the reports on fauna and flora were not implemented. The Catchment Area Treatment (CAT) plan was no doubt under matters are discussed in detail in the relevant sections below.

According to the CMD, THDC, though studies as per clearance letter could not be completed/Action Plans formulated within the dates stipulated by MOEF, the required studies were completed and their reports submitted to Government before project was accorded investment approval in March, 1994. CMD also Stated that having submitted the Study reports to MOEF their acceptance had to be assumed in the absence of a communication to the contrary.

However, the Committee noted that work on the project was ongoing even before the investment clearance was received, in 1994, and, further, the dates for submission of environmental reports and plans, as per the conditions of clearance, were not linked to the date of investment clearance. In any case, it was essential that a comprehensive Study of fauna, flora and other aspects of the environment, and the initiation of the required action plans for their conservation, should have been completed before any engineering works were initiated, so as to prevent disturbance and destruction.

The Committee felt that clearance cannot be assumed as it is presumably stipulated to ensure the appropriateness and adequacy of the studies. Consequently, the Committee came to the conclusion that the conditions of clearance, as laid down by the MOEF in its letter No. 2-19/81-HCT/IA-1 dated 19 July, 1990 read with DO letter No. 2-19/81- IA.I dated 11 October, 1993, had not been complied with. The status of compliance is summarised in table III.1.2 below, and is discussed in the relevant chapters.

Table III.1.2

Management Plans/Action Plans Catchment Area	Prescribed date of submission	340111331011	Whether got approved from MOEF	Whether implemented as per conditions			
Treatment	31.12.90	January, 1994	NO	Not fully implemented as per conditions as it was not completed by 31.12.1995, as stipulated by the MOEF in its letter of clearance. Also, though 29,500 ha, have been treated till today, only directly draining areas are			
Command Area Development	31.3.91 (31.12.93)*	Not yet submitted	NO	Not relevant, as the plan has at it			
Flora	May 1991	July, 1993	NO ·	Not as per conditions. See the seet			
Fauna	May 1991	March, 1993	NO	Not as per conditions. See the section on Fauna and Flora for details.			
Water Quality Maintenance	No date specified	November, 1992	NO	Fauna and Flora for details Not applicable			
Disaster Management	31.391	April, 1992**	NO	Not relevant as the plan has still not been submitted to the MOEF			

	Prescribed date of completion		Whether completed by approved date
Setting up Bhagirathi Basin Management Authority on a statutory basis through legislative action	31.3.1991 (12/1993)*	Not yet set up	NO

extended date

It will be seen from the table that while there have been delays in the submission of studies and action plans, the position is that even several years after such submission there has been neither any final approval by MOEF nor a final rejection followed by consequential action in terms of the conditions of clearance.

RECOMMENDATIONS:

In general, the Committee considers that the practice of according environmental clearance to projects before all necessary studies have been completed and the environmental viability of the project established, is not a healthy one. Also, the economic implications of implementing the required environmental safeguards must be fully assessed and taken into consideration while according economic clearance.

Also, environmental clearance should be given only for a specified period, say two years, at a time and the Project Authorities must subsequently have the clearance renewed based on their record of compliance with environmental safeguards. The Environment Protection Act must also be made more effective so that responsibility can be fixed and deterrent action taken against those who are responsible for not complying with the conditions of clearance.

The Committee recommends that the MOEF should prescribe for itself a time frame within which reports submitted by the THDC should be examined and disposed off.

Some members are of the view that, for the Tehri project, the picture that emerges from the report is that the project was neither properly assessed from the environmental angle, nor properly costed in terms of environmental and rehabilitation requirements, before clearance, albeit conditional, was accorded. They also consider that many of the required environmental studies have still not been satisfactorily completed.

These members are further of the view that, once the studies are completed, the environmental and economic viability of the project should be reassessed; and that the work of the project must be suspended till such an assessment is completed, and the project only allowed to continue if found viable.

However, the majority of the Committee disagrees with this view. It also feels that this is beyond the terms of reference of the Committee and that, in any case, the types of studies being done are not designed for examining the viability of the project.

III.2 CATCHMENT AREA TREATMENT

DESCRIPTION

The total catchment of the Tehn Project, i.e. the area which directly or indirectly drains into the two rivers Bhagirathi and Bhilangana, upstream of the dam, is 6921.25 sq. km. This is divided into 16 sub-watersheds and 149 micro watersheds. Of these, 3557.99 sq km are estimated to be snow bound, rocky, precipitous, alpine blanks or within the submergence area.

^{**} According to THDC, submitted to the Ministry of Agriculture

ISSUES

Catchments of river valley projects are required to be treated for at least four major reasons

- To inhibit soil erosion and the resultant siltation of the reservoir.
- To ensure regulated water flows from the catchment.
- 3. To protect and regenerate the soil and vegetation in the catchment areas, and the resultant water resources, as these are the main resources on which the local communities living in the area depend upon for their survival. This is particularly important in terms of the sentiments of the local people, as expressed to the Committee. Many of them feel that the benefits of their water resources are going to the downstream populations, while their own social and economic life has deteriorated because of suspension of development activities due to the project and the absence of alternate appropriate means for relieving their hardships.
- 4. To minimise the negative impact of the project itself on the catchment. The fact that a large area of forests, grasslands, agricultural land and other common natural resources are submerged by a dam often means that greater pressure is put on the remaining areas, mainly in the catchments. This aggravates the degradation of the catchments. Also, during the construction of the project itself, and subsequently because of heightened economic activities in the area, greater pressure is put on the catchments.

Keeping this on mind, the catchment area treatment (CAT) efforts for the Tehri Project throw up the following issues:

- 1) Whether the area being treated is adequate?
- 2) Whether the type of treatment planned is appropriate?
- 3) Whether the catchment area treatment work already done is satisfactory?

History

Catchment area treatment (CAT) in the Tehn catchment started in 1983-84 in 13 of the sub-watersheds, with the forest department taking up afforestation work in degraded forest and civil soyum land. Subsequently, in 1987, the Land Survey Directorate (LSD) of the UP Forest Department prepared a report on the land use and erosion intensity of the whole catchment. Based on this, the *Tehn Dam Catchment Project* was formulated in January, 1988. Accordingly, the UP Forest Department formulated a CAT plan for 36,000 ha and this was under implementation till 1993-94. The detailed CAT plan was submitted to the MOEF in November, 1989. By then, 5000 ha of CAT had already been treated by the UP Forest Department, mainly through afforestation and some soil conservation works. The MOEF, while according environmental clearance to the project, in July, 1990, stipulated that

- The THDC will, as per recommendations of the Remote Sensing Application Centre, UP, identify the critically degraded areas conforming to the Very high" and high" erodibility classification and prepare action plans by 31.12.90 for the treatment of these areas in consultation with the Government of Uttar Pradesh.
- (b) The action plans prepared will ensure that the catchment area treatment is completed before 31.12.1995 on the basis of detailed annual action plans......"

Meanwhile, in keeping with the conditions of environmental clearance, the Remote Sensing Applications Centre (RSAC) was commissioned by THDC and based on their report discussions were held With the MOEF. The MOEF stipulated, in October, 1993,

- That the RSAC should demarcate on a map the very high and high erodibility areas.
- The forest department data should be reconciled with this.
- Areas already treated should be mapped after evaluating efficacy and success of treatment.
- On the basis of these two maps, the areas still to be treated would be clearly identified and a phased CAT programme be prepared for its treatment before impoundment.

According to CMD, THDC, the final CAT Plan, based on RSAC data, was submitted in April, 1994 at annexure III (xix), after discussions held in MOEF, for treatment of 13,500 Ha. of highly and very highly degraded (E-1 and E-2 Category) areas of direct draining catchment, over and above areas that had already been treated (22,746 Ha.) under the earlier Plan. He Stated that the project is committed to complete these areas well before impoundment.

However, the Committee noted that in his letter to the Committee, dated 24 April, 1997 at annexure III(xiii), the Secretary, MOEF has Stated that the CAT plan has still not been approved by his Ministry. He goes on to say that the THDC had been advised, in 1995, to consider the treatment undertaken prior to 1990 as background and to bring out separately an index map clearly indicating the treatment undertaken so far, and proposed plan of watershed management. According to the Secretary, MOEF, the THDC is yet to submit this map. However, the CMD, THDC Stated that the map had already been submitted.

Area to be treated:

In the Tehri Project only very severely and severely degraded catchments which are directly draining into the reservoir are currently being treated. It was explained to the Committee that 'directly draining' means those catchments of rivers including their tributaries and nallahs which drain directly into the reservoir, and excludes those which drain into Bhagirathi or Bhilangana rivers at points upstream of the rim of the reservoir.

The THDC also made the point before the Committee that at the estimated rates of siltation the dam life even without additional CAT would be over the required 100 years. According to the THDC, even if the rate of siltation was assumed to be 22.72 ha m /100 sq km/ per year, as opposed to the 14.50 assumed by the THDC, the life of the reservoir would be 104 years. The Committee made an effort to have these data verified by the Wadia Institute of

Himatayan Geology, Dehradun, but the report from this institute expresses the Institute's inability to "to work out the rate of siltation of the Tehri reservoir..." [Wadia Institute, June 1997, p. 5 para 6] in view of what they considered to be certain limitations in the data supplied. In any case, the rate of siltation was only one of the various reasons necessitating catchment area treatment and, as such, the area of catchment to be treated could not be determined solely on the basis of anticipated rates of siltation.

Despite detailed discussions, the Committee was unable to find a scientific basis for the distinction between directly draining and non directly draining parts of the catchment, with relevance to catchment area treatment. The Committee was unable to appreciate the argument that the various impacts of degraded catchments were relevant to the Tehri Project only in so far as they occurred in the directly draining part of the catchment, and not in the rest of the catchment, even though the whole catchment, by definition, drained into the reservoir. The Committee, therefore, is of the view that the entire catchment and not just the "directly draining" part of it, needs to be treated, though the costs of catchment treatment may have to be partly debited to sources other than the project, as will be discussed later.

Planning

The Committee examined the revised CAT, plan based on RSAC assessment, circulated by the THDC. Though this document is relatively recent (submitted in January 1994), the Committee found that it did not address the following issues that are relevant for CAT:

- 1. There was no mention of people's participation in the project document, at the planning, implementation or protection stage. Consequently, there was no plan of how to solicit and maintain this. The institutional arrangements essential for making the planning, implementation and conservation of the catchments participatory and sustainable was not spelled out.
- Though the document recognised that there were many pressures on the catchments because of the local community's requirements for income, biomass and energy, there was no plan to divert or minimise these pressures along with the treatment of the catchment, through the identification and development of sustainable alternatives.
- 3. There was an assumption that CAT requires mainly afforestation and civil works for the restoration of degraded areas. Pasture development with grasses and other vegetational cover for soil and water conservation has not received adequate attention.
- 4. There was no list of species to be planted.
- 5. The document acknowledged that, according to the Ministry of Environment and Forests, all the very high and high erodibility categories of catchment should be treated. It, however, went on to plan for only the "directly draining" catchment.
- 6. There was no proposal to develop site-specific micro-level plans.

PCCF Uttarakhand had some reservations on these points.

Implementation

As already mentioned, CAT activities are ongoing in the Tehri catchment from 1983-84. Till date 29,346 ha of area has been treated. During the field visit to the project site, on December 20 and 21, 1996, some members of the Committee specifically visited some of the CAT sites. Given below is a summary of their main findings.

- The civil soyum sites that were visited by the members, which have been treated by the forest department and handed back to the village communities, have degraded over a period of time and require to be treated again.
- 2. This State of affairs is mainly due to the non-involvement of the local communities right from the planning phase and the absence of an effective strategy for handing over the areas to the local communities. Perhaps the forest department's involvement is also needed for a longer duration than the current three years.
- The choice of species in these sites were also not always appropriate. In the opinion of those members who visited the site, Chir pine and exotics like Tropical pine and Silver oak should not be planted as part of catchment area treatment. Instead, there must be much greater stress on grasses and indigenous broad leaf species. In fact, some members of the Committee felt that Chir pine should especially not be planted, as it depletes the soil, prevents the growth of other ground-cover plants, creates a fire hazard and dries up water sources. However, the representative of the UP forest department felt that the plantation of Chir pine, Tropical pine and even the exotic Silver oak was appropriate depending on site conditions.
- Though the reserve forest areas visited by members of the Committee were better protected, even these would be impossible to conserve sustainably unless there was involvement of the local community right from the start, which was absent.
- The practice of taking up small patches, of sometimes less than five ha., for isolated treatment, rather than the whole micro water shed as a unit, was not conducive to the effective treatment or sustained conservation of the catchment.
- There was no effort to treat the agricultural areas in the catchment, despite the fact that, in terms of their impact on the project and on the local people, such areas should be amongst the highest priorities for CAT.

RECOMMENDATIONS:

The Committee, accordingly, recommends the following

The degraded areas, both forest and non-forest, with very high and high levels of erodibility, should be treated in the entire catchment of the Tehri Project and not just in the "directly draining" portion. These must be treated at project cost and their treatment must be completed before impoundment starts

- Catchment area treatment should not be restricted to small patches but each of the micro water sheds (MWS), where patches of very high and high level of erodibility occur, must be treated in its entirety, including the non forest areas in that MWS.
- The total area needing treatment has been tentatively estimated to be 740.15 sq km of forest and non forest land. The details are as given in the table below. These figures, however, need to be finalised by reconciling the various data bases and updating the data.:

Estimated area needing treatment (sq km)

Erodibility class		Forest	Non forest		
	1 Total area	2 Area to be treated	3 Total area	Area to be treated	
Slight/moderate	1239.16	61.96 (5% of 1)	780.77	156.15 (20% of 3)	
High/very high	441.57	441.57 (100%)	80.47	80.47 (100%)	
Total area to be treated		503.53		236.62	

An area of 293.50 sq km of high and very high erodibility forest area has already been treated, though some of this might need to be retreated, as specified earlier in this section. On the other hand, area already adequately treated by any other agency or through any other programme should not be re-treated. The total cost of treatment of this catchment area, as calculated by the UP Forest Department, comes to about Rs. 90 crores, in addition to what has already been spent.

- 4. Ideally, this treatment should have been so planned and implemented as to finish at least two years ahead of impoundment, encompassing all land based activities, both on forest and non forest land, to allow the catchment to stabilise. This might no longer be possible in the case of Tehri. As things stand, the treatment of the very high and high erodibility categories of land must be done in accordance with the recommendations of this Committee, at project cost and pan passu with the engineering works so as to finish before the start of impoundment.
- 5. In addition, the Committee recommends that the remaining MWS in the Tehn project catchment, with areas of only medium and low category of erosion, should also be taken up for treatment. This area has been tentatively estimated to be 780.77 sq km of non forest land and 1239.16 sq km of forest land, though only a part of it, as tentatively estimated in the table above, will need treatment. The Committee recommends this because it thinks that there is no justification for ignoring such areas, as in the absence of treatment, they would continue to degrade and soon reach very high and high levels of erodibility. While such areas need not be treated at project cost, treatment should be ensured.

The Committee recognises the need to treat the catchments starting from the top and progressing downwards, i.e., from the ridge down to the valley. Therefore, it recommends that the CAT activities be taken up from the ridges irrespective of whether the MWS at the top of the ridge is a part of the area that has to be treated at project cost or not. Also, the activities should start from the MWS nearest to the dam site and then progress outwards.

In order to apportion the costs between the project and other sources, and assess whether the work is on schedule, the cost of treating an area equivalent to that of MWSs with high and high erodibility should be charged to the project, and its progress in terms of the actual area treated should determine whether the work is pari-passu with construction. The remaining area should also be treated as expeditiously as possible, though not at project cost.

- The catchment area treatment plans must be totally revamped and must not only include forest areas but also non forest areas including cultivated lands which need treatment.
- 8. The catchment area treatment should be planned and implemented in partnership with the local communities and in an integrated manner, incorporating the following principles:
 - Identification and demarcation of the degraded or degrading microwatershed (MWS), using remote sensing, topo sheets and ground truthing.
 - ii) Identification of the local communities with a stake in, and/or an impact on, the MWS.
 - Formation of a community institution, like a micro watershed development team (MWDT), similar to joint forest management teams in reserve forest areas, with all adults of the identified communities as members of the general body and the team consisting elected members with adequate representation of women and SC/ST/OBC in proportion to their strength in the general body. The leader of the MWDT should be chosen by the general body.
 - The MWDT should be assisted by members of the CAT implementing agency, specifically by a forester, and representatives of other disciplines relevant to the MWS including, as appropriate, village level extension officers in animal husbandry, agriculture, imgation, soil conservation, etc.
 - v) The MWDT should be responsible for jointly planning and implementing, along with the CAT implementing agency, the catchment area treatment activities in the MWS, on the basis of a participatory, integrated, site specific micro level plan (for illustration see annexures III(xx) & III(xxi))
 - vi) The activities planned and executed under the CAT plan must be focussed on prevention of soil erosion, regulation of water runoff and

stabilisation of slopes. In order to keep costs down and promote sustainability, primary stress should be given to land use planning, planting and regeneration of vegetative cover and minor soil and water conservation works, with only very essential engineering structures. Social and ecological sustainability of CAT must be ensured and, for the purpose, without compromising the objectives of CAT, efforts must be made to promote species which are preferred by the local people and suitable for the local conditions.

- Apart from regenerating the MWS, the pressures that led to the degradation of the MWS in the first place must also be identified. Appropriate action plans must be developed and implemented, through the MWDT, for diverting and minimising these pressures. This would involve the ecodevelopment approach where investments would have to be made in finding alternate sources of, or alternates to, the biomass and income needs of the local communities which are being currently met from the catchment area but unsustainably (for illustration see annexures III (xxi).
- viii) Suitable financial and administrative arrangements would have to be made to ensure that decentralised decision making through the MWDT is made possible and that the flow of funds is appropriate and timely.
- At the completion of the project period the responsibility for maintaining the non forest areas, including the civil soyum forest areas, would shift fully to the local community structures, with monitoring functions performed by State authorities and independent monitoring institutions. Joint forest management structures will be established, as laid down in the UP Government guidelines.
- In order to ensure the financial viability of these community institutions, MWS level trust funds should be formed with initial inputs from the project funds. Once the CAT project is completed, maintenance of the catchments must be ensured through peoples participation and made economically viable by making payments to the community for forest protection work done on behalf of the forest department.
- xi) In general, it must be ensured that the local communities develop a stake in the sustainable conservation of the catchment.

The Committee has been given to understand that such an approach has not only been adopted by the central ministries of agriculture, rural development and environment & forests, but also by the Uttar Pradesh Government in its Doon Valley Integrated Watershed Management Project, and in other projects. As such, the recommendations of the Committee are in keeping with accepted practice.

Perhaps to develop the detailed plan, the implementing agency can appoint a small Committee with some representation from NGOs with experience in such work.

- The catchments already treated need to be retreated, wherever necessary, 9. by following the guidelines specified for the new catchment areas. In those cases where the THDC (or other implementing agency) feels that the areas already treated are up to the mark, both ecologically and socially, a site by site assessment should be made by the monitoring Committee which is being recommended to monitor the environmental and rehabilitation aspects of the project.
- The treatment of catchment must be regularly monitored by the 10. aforementioned monitoring Committee. The reports of this Committee should form an important basis for determining whether catchment area treatment is proceeding pari passu, both in terms of quality and extent.
- 11. The Committee also recommends that a green belt be planted along the rim of the reservoir, with the involvement of the local people, to prevent soil erosion and the flow of silt into the reservoir.
- An environment cess may be levied, on the power sold, for meeting the 12. increased expenses on measures for environmental protection and regeneration. The estimated amount should be advanced by the Ministry of Power and subsequently recovered from the said cess.

FAUNA AND FLORA 111.3

The Committee examined the reports submitted on the impact on fauna (by the Zoological Survey of India) and flora (Botanical Survey of India) for the Tehri project in terms of the conditions of environmental clearance and as per the requirements of its terms of reference. These reports are discussed below.

. Discussion of the report on fauna submitted by the Zoological Survey of India (Arora GS, Arun Kumar and Akhlaq Hussain, Environmental Impact Assessment Study Faunal Analysis, Zoological Survey of India, Northern Regional Station, Dehradun, 1993.)

Summary of findings and recommendations

The major groups dealt with were:

vertebrates:

mammals, birds, reptiles, amphibia, fish

invertebrates:

butterflies, dragonflies, wasps and bees, spiders and

scorpions, centipedes

Their main findings, conclusions and recommendations are summarised below.

- A total of 282 species, 159 invertebrates and 123 vertebrates, were inventoried from
- 18 species of mammals were recorded from the Study area. Of these two, the leopard and the leopard cat, are listed in schedule I of the Wild Life (Protection) Act of 1972.
- However these and other species of mammals, including the porcupine and the otter, are also found in other parts of the region, and therefore are not threatened by the

It is expected that the local population of the Otter would dwindle once the dam is

Conclusion: The impact of the dam, however, can be known if the Study is continued till its full impoundment and after.

- It is an established fact that no impact assessment of birds can be done in less than 2-3 years. However, as the time given for the Study was only six months, the listing made is only preliminary. It is expected that a large number of species may further be added to the present number if a detailed and systematic studies of the area are carried out for at least the next two to three years.
- 73 species and subspecies of birds were recorded from the area. Of these, the Indian sparrow hawk is endangered and is listed in schedule I of the Wild Life (Protection) Act, 1972. Another, the Ringtailed or Pallas's fishing eagle is categorised as rare in the 1990 IUCN list of threatened animals.
- All the species are widely and commonly distributed in the Western Himalayan Ecosystem.
- The formation of the reservoir might attract a large number of migratory birds, thereby adding to the aesthetic and tourism value of the project.
- Recommendations:
 - Regular updating of the birds list of the area is suggested for the next two to three years.
 - 2. Simultaneously, for a complete impact assessment Study, it is necessary to select some 15 to 20 commoner or most sighted birds, as indicator species, and work out their relative densities and abundance over a two to three year period.
 - 3. Post impoundment Study on the above pattern is also desirable.
 - Among reptiles, four species of lizards and six species of snakes were collected from the Study area. Of these, the monitor lizard is listed in schedule I of the Wild Life (Protection) Act of 1972.
 - If thorough surveys for longer periods are conducted, some more species are likely to be added to the list.
 - The populations of the Striped keelback and Checkered keelback snakes may increase after the reservoir comes up due to increase in the population of frogs and tadpoles, which is their basic diet. Populations of the trinket snake and the garden lizard might deplete.
 - In general, with the coming of the reservoir, this reptiles may move and establish themselves in neighbouring areas.
 - Recommendations: Suitable habitat needs to be developed on the periphery of the
 reservoir to enable the reptiles to establish there. Crocodiles, turtles and tortoises
 may be introduced into the reservoir.
 - Ten species of fish were collected from the Study area. Another 12 species reported earlier from the region, were not found during the Study. The non availability of some of them might be due to the impact of dam construction activities. \
 - The Golden mahseer and the Snow trout are likely to be adversely affected by the dam. The other fish may migrate upstream.
 - It has been observed during the past that, whenever a dam is constructed the fish fauna of that river is harmed tremendously as generally no proper arrangement is provided for free up and down movement of the fishes.
 - Recommendations:

To ascertain the present status of the population of all these fishes more investigations are suggested.

Fish ladders should be provided.

There should be monitoring during breeding seasons.

Rearing centers should be developed.

There should be better management of fish resources.

Additional species should be introduced.

The side wall of the reservoir should be designed in step or stair system.

Among insects, 81 species of butterflies were collected. Of these, two are listed in schedule I of the Wild Life (Protection) Act of 1972. Two of these are also rare, while the others are widely distributed. 29 species of dragonflies were found, none of which were either endemic, threatened or endangered. 24 species of wasps and bees were recorded, of which one is rare. All others are known to occur in other areas and hence not threatened. 21 species of spiders, two species of scorpions and two species of centipedes were collected. None are endemic or threatened.

• Recommendations: Simultaneously create a similar, suitable habitat with the required host plants in the surrounds of the reservoir so that the various species can relocate themselves. Any depletion in the insect population will also have a negative impact on

the bird populations.

Our Comments on the report are given below

Terms of reference

The terms of reference (TOR) for the fauna and flora studies, as specified by the MOEF vide their letter of 19 July, 1990, were: (Annexure III(i))

"THDC will commission a Study of the flora and fauna going under submergence as well as that affected by related works in the region so that reclamation plans can be worked out along with setting up of botanical gardens. The Study of flora and fauna must be completed by May, 1991, and action plan prepared thereafter to be executed before impoundment commences."

The THDC, vide its letter of 29 October, 1993, specified the following TOR to the ZSI (Annexure III (xxxiii))

- The detailed survey and investigation identifying, location wise, the fauna "1. coming under the submergence of Tehri and Koteshwar reservoirs and spelling out the rare species that needed protection;
- The Scheme and Action Plan for construction (sic) of the rare species; 2.
- Providing supervision and guidance during implementation of the action 3 plan;
- Details of adverse effects on the Wildlife habitats in the region; and 4.
- Studies on the adaptability of the fauna to the new habitat." 5.

In the body of the letter, the THDC Stated:

"The Study should identify the impact of reservoir on the habitat fragmentation and migration pattern of rare & endangered animal species frequenting the area."

The ZSI did not agree to accept the terms of reference given by the THDC in full and Stated in the report:

"In view of the persistent demand of the THDC authorities to submit the report within a very short period of about six months and the present working pattern/expertise available at Zoological Survey of India, Dehradun, only the following aspects were committed to be studied:

- The detailed list of the fauna of the area, including endangered/ 1. threatened species, if any:
- The possible impact of the creation of reservoir on the fauna of the 2 area: and
- Conservation of the rare and other vulnerable species like Mahseer." 3

- a) The ZSI focused on the conservation of fare" and other vulnerable species like Mahseer. It is equally necessary to Study the impact of the project on hon rare" species. Species which are not nationally rare may be locally rare; and species which may not be rare now may become rare through the adverse impacts of projects or for other reasons. Some may even become locally extinct. It may be then too late to initiate corrective action.
- b) It was not clear from the terms of reference whether the impact of the reservoir and other project activities on the fauna outside the submersion zone was also to be studied.
- c) Even though the ZSI accepted the THDC's terms of reference only partially, yet no supplementary Study by any other agency was commissioned by THDC to cover items not accepted by ZSI.

The CMD, THDC, Stated that the terms of reference of Study were not restrictive in any way and merely an emphasis had been rightly placed on protection of rare species. The ZSI report also covers all the species found in the area, and not merely the rare species.

However, the ZSI, in its note to the Committee, had Stated that "as per the mandate, the rare and endangered species in accordance with the Indian Wildlife (Protection) Act, 1972 have been highlighted," and that the main thrust has been on the rare and endangered species." (full text at Annexure III(xxxv)

2. The quality of the report

a) The time (six months) given to the ZSI for completing the report was too short. It is well known that any Study attempting to assess the ecosystem needs to be carried out over at least a two year period in order to get a correct picture of the seasonal ecological changes. The ZSI report itself admits this inadequacy of time, in many places. The Director of the Zoological Survey of India also wrote to the Committee on 10 March, 1997, (full text at Annexure III(xxxiv) in response to specific queries from the Committee, and said:

"I must point out to you that the report submitted earlier in this connection by the ZSI was only preliminary in nature and as such can not be used as a basis for determining the final impact of the project. The project report had to be prepared at that time within a period of only six months and this had to be done along with the general activities of the NRS utilising the same manpower of scientists.

b) The Study was commissioned in end 1992 despite the fact that, according to the conditions of clearance specified by the MOEF, the Study should have been completed by March, 1991. The fact that the Study was commissioned after the construction of the dam had started could conceivably have resulted in an unknown number of species disappearing from the region. The ZSI report makes several references to this possibility:

"...As a result, some of the faunal disturbance/migration/degradation/ depletion may, therefore, have already taken place." (Introduction)

that the population of these fishes has already been depleted, may be due to the dam construction activity during the past [p 55].

"It (the Golden mahseer) will be the most affected and harmed species of the area by the construction of the Dam. The effect is already evident" [pp 47-48]

"...the population of this fish (the McClelland's Snow Trout) has been badly affected by the man made hindrances/barriers on river Bhagirathi." [p.49]

It is clear that the delayed commissioning of the Study resulted in a serious limitation on its usefulness.

- c) It was Stated by CMD, THDC, that faunal studies in the project area had been conducted in the past also and their findings had been taken into account by ZSI in this Study. However, the Committee noted that no details of the earlier studies were given in the report submitted to the THDC and it was not at all clear how extensive these earlier reports were and how much they were used in the report under consideration. The correlation between the intensity and duration of surveys and the number of species recorded is scientifically well known. The chances of recording rare species is even more dependent on the thoroughness of the surveys. It is doubtful whether the kind of survey conducted could have recorded the rare species, especially among the insects, birds, fish, reptiles, amphibians and the smaller mammals.
- d) For many species of fauna that occur in the submersion zone the ZSI only indicates that they may not be negatively affected. (see pages 31, 32, 33, 36, 38, 39, 41, 49, 50, 51, of the ZSI report) This assessment is not only tentative but is also unsupported in most cases by any reasoning.
- e) The assertion that many of these species will migrate upstream and establish themselves there is also questionable in the absence of any specific Study to establish this. The subsequent assessment done for one species, the Mahseer, by the Tropical Fisheries Consultancy Services, for the THDC (Action Plan for Mitigating the Possible Impact on Mahseer Fishery due to construction of Tehn Dam, April 1994) shows that such an assumption would be unsound. It States that
 - "... even if Mahseers are allowed to go over these dams, the physicochemical conditions above the Tehn dam would not be conducive for their natural breeding." (p iii)

It goes on to say that

"..the mahseer migrates to shallow streams having pebbles where the waters are comparatively warm (19 - 28°C) for breeding as well as to ensure the survival of the offsprings. With the formation of the Koteshwar and Tehn dams, river Bhagirathi would have lacustrine conditions upto 60 kms upstream of Koteshwar dam. Only beyond Uttarkashi, can one expect to find shallow riverine conditions with pebbly bottom. However, temperature in this snow fed region would be much lower than what is required for Mahseer for its breeding. In other words, even if Mahseers are assisted to go past these dams, biologically it would not be possible for the fish to breed and ensure survival of the spawn, since the hatchlings would get washed down to deeper waters of the reservoir and get destroyed." (p 26)

A similar detailed analysis for each of the species needs to be done before it can be assumed that the project would not negatively affect them. For terrestrial species, the suitability of neighbouring habitats can only be assessed once the catchment area treatment plan is ready and it is possible to see what sorts of habitats were and would become available in the periphery of the reservoir.

The CMD, THDC, Stated that it was precisely because the conditions in and upstream of reservoir were not conducive for breeding of Mahseer, that TFCS had suggested artificial breeding in hatcheries, for which Action Plan had already been drawn and is to be implemented pari-passu with engineering works.

The various activities and effects of the project that could have an adverse impact on the fauna should have been listed. These would include broadly construction of roads, construction of houses and buildings, excavation of earth and stones, construction of the diversion canals, construction of the head race canals, construction of the coffer dam, construction of the main dam, filling of the reservoir, operation of the turbines, etc. The possible disturbance from each of these activities should then have been listed, for example rise in dust levels, rise in noise levels, other disturbances, changes in water quality especially in terms of turgidity, temperature, pressure, BOD, DO, and other pollutants, changes in micro climate because of the reservoir, etc. Having identified these, the sensitivity of each species to each of these activities and effects should have been indicated in a matrix, in accordance with standard environmental impact Statement formats. The basis for each such assessment should also have been indicated.

In the present report only some of the impacts of the reservoir have been taken and not the impact of the various other related activities. Also, as already mentioned, even for the impact of the reservoir, no basis has been given for stating that various species "may not" be affected.

g) The threat to breeding habitats, especially fish breeding habitats due to the Tehni dam, has not been assessed. This is especially important as, according to the ZSI report:

"It has been observed during the past that, whenever a dam is constructed the fish fauna of that river is harmed tremendously as generally no proper arrangement is provided for free up and down movement of the fishes." (Page 44)

(See also the quotations given earlier for the Tropical Fishenes Consultancy Services' report on the Mahseer).

- be The ZSI's recommendations regarding the construction of fish ladders and the mechanical transportation of fish, captive breeding of fish etc., need to be reassessed in the light of the adverse comments in the report of by the Tropical Fisheries Consultancy Services (TFCS). In any case, as fish ladders cannot be built, as recommended by the ZSI, the impact on the fish fauna of the river system needs to reassessed assuming that there will be no fish ladder.
- There is no assessment of the impact on the riverine fauna downstream, due to variations in river flow and the trapping of sediments at the dam. The TFCS report States

"Considerable reduction of flow in the residual river tailing below the dam, significantly alters the spawning grounds, which may even dry up. The reduction of water levels in the residual river results in the formation of shallow areas which impede or obstruct fish movement." (p. 37)

Any comprehensive impact assessment should also involve an assessment of the complete ecosystem, and not just individual species, and on populations and of each species must also be assessed, and not just its own physical presence. The corridors must also be assessed. The cumulative impact of the project and the reservoir in isolating populations and interrupting impact of the disappearance or decimation of one species on others must also be assessed. For this purpose, the final assessment must be a coordinated effort by the Director of the ZSI who, in his letter to the Committee, dated 10 March, 1997, says: (Annexure III (xxxiv))

"The assessment of the impact on the population in valley needs to be more comprehensive with special reference to fish and mammals. To my mind detailed report is called upon as any comprehensive impact assessment would also involve the impact assessment of all ecosystem and just not individual species. Therefore, I suggest that the final report should be a coordinated effect and hence the Wildlife Institute of India, Dehra Dun may be approached to submit a comprehensive impact assessment report and ZSI and BSI will help in the identification of the organism and plants collected by Wildlife Institute of India."

The CMD, THDC, Stated that the MOEF in their response forwarded to the Committee have specifically intimated that "the reports on the surveys of flora and fauna have been received from BSI and ZSI. These indicate that there are no endangered species of flora and fauna that would be affected by the Dam. Based on these surveys a plan has been prepared for transferring Mahseer fish from downstream of the dam to the lake for spawning purpose. Plantation of certain suggested species is being taken up under the afforestation programme." It is accordingly clear, as per the CMD, that the reports of ZSI (and BSI) had the approval of MOEF.

However, the Committee felt that these remarks of the MOEF were merely in the nature of stating facts about the receipt of the report and what it said. There is no specific approval from the MOEF, as required under the conditions of clearance, and given the view of the MOEF that approval cannot be presumed. However, the Committee feels that, given these remarks, the MOEF should have taken a definite view on the report and settled the issue, one way or another, at the earliest.

After detailed consideration, and in light of the above, the Committee came to the conclusion that this report did not constitute a comprehensive assessment of the project in terms of the project's impact on fauna.

Discussion of the report on vegetation submitted by the Botanical Survey of India

(Uniyal BP and Surendra Singh, Vegetation of the Tehn Dam Submersible Area: An Environment Impact Assessment, Botanical Survey of India, Northern Circle, Dehradun, 1993)

Summary of findings and recommendations

The findings, conclusions and recommendations of the report are summarised below:

- A total of 672 species of plants are recorded from the Study area, of which more than 125 were added in this Study.
- There are many rare, medicinal, and economically useful species in the area.
 However, none of these are restricted to this area alone, hence the construction of the proposed dam will, in no way, lead to the extermination of any species.

Recommendations:

THDC should plant indigenous species in the surrounding areas.

THDC should plant trees suitable for perching of birds in the periphery of the reservoir.

Certain species should be introduced to provide support to the fishes and for aesthetic reasons.

Our comments on the report are given below.

Terms of reference

The terms of reference (TOR) for the fauna and flora studies, as specified by the MOEF vide their letter of 19 July, 1990, were:

"THDC will commission a Study of the flora and fauna going under submergence as well as that affected by related works in the region so that reclamation plans can be worked out along with setting up of botanical gardens. The Study of flora and fauna must be completed by May, 1991, and action plan prepared thereafter to be executed before impoundment commences."

The THDC, vide its letter of 29 October, 1993, specified the following TOR to the BSI

- "...you are requested to kindly to submit your proposal on conservation a Study (sic) of the Flora going under submersion of the two reservoirs. Broadly the studies would involve the following:
- 1) The detailed survey & investigations identifying location wise the flora coming under submergence of the two reservoirs and spelling out the rare species that needed protection.
- II) The scheme & action plan for the conservation of these rare species.
- iii) Providing supervision & guidance during implementation of the action plan."

In the body of the letter, the THDC Stated:

"The earlier surveys conducted by the ZSI and BSI has identified large number of plant and animal species. Inadvertently the earlier studies were not supplemented by the precise locations on the map of these species.......When the locations of these species are identified then the task of conservation, of rare and endangered species become more precise."

From the above it appears that

- a) The TOR given by the THDC, to the BSI, focuses on fare" and endangered species. It is equally necessary to Study the impact of the project or hon rare" species, particularly those which might become locally extinct.
- b) There was also nothing in the terms of reference about the impact of the reservoir on the flora outside the submersion zone, though the letter of the MOEF specifically mentions the species going to be affected by related work in the region.

2. The quality of the report

a) The focus on rare and endangered species in the TOR results in a similar focus in the report. For example, the report says:

Again, later:

"Special attention was paid to the twelve species considered as rare in an earlier reportstudies revealed that these species have either a wide range of distribution or are out of the area to be submerged. Therefore it is concluded that no endemic/endangered species occurs in the area" (Summary p2)

There is no effort to assess the impact of the project on the populations and distribution of species or on their viability in the region. In fact, it has repeatedly been Stated that many of the species being submerged are found in other regions of the country. The impact of the project in terms of making these species locally extinct has not been assessed.

- The methodology used in this Study for the collection of data has not been specified. It is therefore difficult to judge whether the methodology used was appropriate. Unless the transacts, plots or locations used for collecting samples are properly representative of the region, the resulting collections are unlikely to be representative, especially in terms of rare and endangered species. The BSI, in their response to the Committee, vide letter of 9 June, 1997, (full text at Annexure III(xxxi)) have Stated that different ecogradients of the Study site were surveyed to make the sampling as far as representative as possible within time limit given for the Study." However, the methodology has still not been detailed. The time limit given for the Study has been mentioned as a constraint, but it is not known what this time limit was and how critical was the resultant constraint.
- c) Even for the species collected, in most cases no basis has been offered in support of the Statement that none of these plants are rare or endangered. In fact, even what is meant in this report by fare or endangered has not been specified. Many of the species listed are, In fact, locally rare as they have been shown to be so by earlier studies (eg. Bhattacharyya and Goel, 1982) and even by the current Study (eg Urticularia striatula, Tamarix dioica, Pterospermum acerifolium, Scabrida, Toona ciliata, Maytenus royleana, Vitis flexiuosa, Leea edgeworthii, Alysicarpus bupleunfolius,

Calyx teragona, Dalbergia sencea, Desmodium motonium, Lathyrus laevigatus, Mucuna nigncans, Urana picta, Agrimonia aitchisonii, etc etc.). In fact, on a cursory look, over 70 species listed in this report were actually rare in the region, in the sense of having limited occurrence. A few, like the Gloriosa superba, are now considered rare even at the national level. However, all this was evidently not the rehabilitation of these species or assess the impact their disappearance would mammals and other fauna.

In its earlier cited response to the Committee, the BSI has Stated:

"Rare or endangered plants are categories of plants that face threat due to various reasons.Such plants can be preserved through conservation measures as recommended in the report of the Botanical Survey of India". However, the BSI report does not give any detailed rehabilitation plan, nor does it assess the viability of the various species establishing themselves elsewhere in the valley. Perhaps this was to be a part of the action plan, but that never got

- Many of the species identified were medicinal species whose disappearance in the region would be a significant loss to the local people, a large proportion of whom mention two, Verbena officinalis which is insecticidal, and Artemisia sp. which is considered to be effective in preventing and treating malaria. With the coming up of most unfortunate if there is a simultaneous loss of the medicinal species that the local people could use for their protection. However, there is no assessment of the impact of the project on medicinal plants nor any action plan to rehabilitate them in rehabilitated, without even giving a comprehensive list (Recommendations, para 2).
- Similarly, there are, in the list, many wild relatives of cultivated species, for example what would be the impact on the disappearance of such species on local agriculture and no action plan for their rehabilitation. The BSI's response to these points (6 and There is also a suggestion that as many of the local people will be relocated there detailed action plans for the rehabilitation of these species in the immediate vicinity ecosystem would not become bereft of these species and that the local people remaining behind would continue to have access to them.
- The Study lists various lower groups of plants, viz bryophytes, fungi, lichens, and algae, from the submersion zone. However, many of them are identified only upto species level.
- g) Apart from submergesion, other project related activities could also have impacts on vegetation even outside the submersion zone. For example, there is no assessment the impact of dust pollution on the vegetation. As the present Study focuses on species outside that zone would be adversely affected

- The impact of changes in micro climate resulting from the project on the vegetation of the region have also not been assessed. In fact, what is required is a standard environmental Impact Statement with a matrix indicating what activities and consequences of the project could have an impact on the various species of flora, and a specie-by-species assessment of how severe this impact would be. The basis for each such assessment would also need to be indicated.
- The impact on vegetation downstream, due to variations in river flow and the trapping of sediments at the dam, also need to be assessed. Incidentally, the BSI, in its response to the draft report, offers no comments on points f, g, h & i.
- This Study was also commissioned well after the construction of the dam had been started. The Study was commissioned in 1992 though the conditions of clearance specified by the MOEF required the Study to have been completed by March, 1991. As in the case of fauna, this delay could conceivably have caused damage even before the Study started; but it is not possible to assess that damage now. For instance, the BSI reports that

"Large scale construction activities at the Dam site has taken a heavy toll of the vegetation and topsoil." (Recommendations)

After detailed consideration, and in light of the above, the Committee came to the conclusion that this report did not constitute a comprehensive assessment of the project in terms of the project's impact on flora.

REMEDIAL MEASURES SUGGESTED BY ZSI/BSI

The following is a brief resume of the recommendations contained in the ZSI/BSI report. Fauna

- 1. (For mammals) The impact of the dam can be known if the Study is continued till its full impoundment and after.
- 2. Regular updating of the birds list of the area is suggested for the next two to three years.
- 3 Simultaneously, for a complete impact assessment Study, it is necessary to select some 15 to 20 commoner or most sighted birds, as indicator species, and work out their relative densities and abundance over a two to three year period.
- 4. Post impoundment Study on the above pattern is also desirable.
- 5. Suitable habitat needs to be developed on the periphery of the reservoir to enable the reptiles to establish there.
- 6. Crocodiles, turtles and tortoises may be introduced into the reservoir.
- 7. To ascertain the present status of the population of all these fishes more investigations are suggested.
- 8. Fish ladders should be provided.
- 9. There should be monitoring (of fish) during breeding seasons. (The TFCS recommended breeding centers downstream of the dam but, even if these were to succeed, they are only designed for the Mahseer. Also, they would restock the lower reaches of the river but the upper reaches would forever lose this and other species and would suffer the consequent biodiversity changes).
- 10. Rearing centers (for fish) should be developed.
- 11. There should be better management of fish resources
- 12 Additional species (of fish) should be introduced.
- 13 The side wall of the reservoir should be designed in step or stair system to help the fishes

14 (For insects) Simultaneously create a similar, suitable habitat with the required host plants in the surrounds of the reservoir so that the various species can relocate themselves

Flora

- 15.THDC should plant indigenous species of plants mentioned in the BSI report in the surrounding areas.
- 16.THDC should plant trees suitable for perching of birds in the periphery of the reservoir.
- 17. Certain species of plants should be introduced to provide support to the fishes and for aesthetic reasons.

It was Stated by the CMD, THDC that the UP Forest Department had specifically confirmed that the species of plants suggested by ZSI/BSI were being planted/would be planted as a part of the Catchment Area Treatment programme and that some species could be planted only after formation of reservoir. Therefore, appropriate action was being taken in this regard (Annexure III.xv, xvi, xvii).

As per the evidence before the Committee, though the catchment area treatment of the area adjacent to the reservoir is in an advanced stage, the recommendations of the ZSI and BSI regarding the species to be planted have not been implemented, nor any detailed management plans developed for doing so. The THDC had passed on the relevant recommendations to the UP Forest Department who, however, have not implemented the same. The representative of the UP Forest Department expressed the view that these various species would regenerate on their own after the catchment area treatment work was over. However, this seems to be at variance with the specific recommendations of the ZSI and BSI to plant these species. The matter, therefore, should have been referred back to the BSI and the ZSI for their response.

At least some of these species will become locally extinct once the reservoir comes up, as they have only been recorded from the submergence zone. Besides some of the other species are not aggressive and would not ordinarily propagate on their own into new areas. Therefore, these at least would have to be identified and planted well before impoundment starts.

Besides, many of these species are needed as soon as impoundment starts, to help some of the faunal species from the submergence zone, especially the mammals, reptiles, butterflies and birds, to attempt to relocate themselves above the submersion level. If these species have not already been planted and established before submergence, then this purpose would be lost. This is especially true of perching trees recommended around the reservoir, which would take at least fifteen to twenty years to come up, but have yet to be planted

It was, however, informed by CMD, THDC, that as earlier Stated it is planned to take up further faunal and floral studies commencing two years before impoundment and would continue for one year after impoundment, so as to reconfirm the effect of impoundment on the fauna and flora and take appropriate additional measures, wherever required.

The Committee analysed the recommendations made by the ZSI and the BSI, as listed above, and noted that action should have been initiated on recommendations 1, 2, 3, 7, 9 and 16 immediately after the reports were submitted, ie, in 1993. However no action has yet been taken on these. Action plans should also have been drawn up on recommendations 13, 14, and 15. These have also not been prepared so far.

RECOMMENDATIONS:

The Committee recommends that:

- A comprehensive, multi disciplinary Study (covering botany, zoology, water-quality, micro-climate, and their inter-relationships) be undertaken to identify in detail the impact of the project on the fauna, flora and biodiversity of the region. The Study should take into consideration the various concerns mentioned above. It should focus on the impact on populations and on local viability of species, and not just on rare or endangered species.
- ii) The Study should be so designed as to cover at least two complete annual cycles and should be carried out in accordance with well established scientific methodology for such studies.
- iii) If these studies throw-up a need to minimise the impacts of the project on any population, species, or ecosystem, there must be a verification by the MOEF that the steps required to minimise such impacts have been initiated. The MOEF should within a reasonable period get an assessment done and ensure that those activities of the project which might adversely affect fauna or flora be appropriately restricted, modified, slowed down or even suspended if necessary, till the above mentioned Study is completed and the steps required to minimize such impact have been initiated.

III.4 IMPACTS ON HUMAN HEALTH

It is well recognised that reservoirs provide fertile breeding ground for disease carrying vectors. River valley projects have been linked to diseases like schistosomiasis, malaria, filaria, dengue etc. Considering that the reservoir of the Tehri project is below 1000 m altitude, there is great likelihood that it would promote the breeding of vectors, unless adequate preventive measures are taken.

This issue had earlier been raised by the Bhumbla Committee in 1990. Unfortunately, the MOEF, while according conditional environmental clearance to the project, did not mention the health aspect at all. Therefore, no Study seems to have been conducted so far to determine the potential health hazards of the Tehri reservoir

RECOMMENDATIONS

The Committee recommends that a comprehensive Study of the potential health impacts of the Tehri dam, not only through its reservoir but through all other aspects including the reservoir of the downstream dam, and the impaction canals, be urgently carried out. This Study should identify all the possible negative health impacts and develop appropriate preventive action plans. Where total prevention is not possible, appropriate and adequate curative plans should be developed. The Study and the action plans should be got approved from the Ministry of Health, GOI. The proposed monitoring Committee should ensure that the plan is speedily prepared and should monitor its implementation. Needless to say, the plans should be drawn up and action initiated well before the impoundment of water starts.

III.5 DUST POLLUTION

The citizens of Tehri complained to the Committee, during the field visit, about the health hazards faced by them from the high levels of dust because of the project activities. Dust pollution is doubtless inevitable where earthwork of such huge proportions is being carried out, especially when it involves excavation and transportation of earth fill material. However, given the proximity of the town and other habitations, and the fact that such pollution is also a health hazard to the project workers and destructive of the environment, it is essential to minimise its level.

RECOMMENDATIONS

- The Central Pollution Control Board (CPCB) should immediately set up a series of air pollution monitoring stations in the town and around the project and excavation sites. The cost of installing and maintaining these stations should be met by the Tehri Project Authorities. The CPCB should clearly indicate the standards and limits which the dust levels should not exceed. If appropriate standards are not available, the CPCB should urgently formulate them.
- 2. The THDC should urgently have an action plan prepared for controlling the dust levels so as to ensure conformity to the aforesaid standards at the earliest. The plan should be completed and implementation initiated within three months, to the satisfaction of the MOEF.
- 3. The weekly dust level readings from the monitoring stations located at centres of habitation should be published in local newspapers along with the prescribed standards for the areas. These should also be periodically reviewed by the monitoring mechanism being recommended for the environment and further remedial action taken from time to time, if required.

III.6 WATER QUALITY

The Roorkee University was asked by the THDC to carry out an assessment of the water quality of the reservoir. Their report was furnished to MOEF in November, 1992. However, MOEF have not so far indicated whether the report has their approval. The conclusions of the report were:

- 1. The Tehri reservoir is expected to get thermally stratified within first year of its filing.
- 2. The temperature in the stratified reservoir will vary from 13° C to 17° C between the reservoir elevations 600.0 m and 800.0 m.
- The predicted D.O. profiles show the effect of various values of first order decay constant, K, and the initial B.O.D. in the reservoir only in the first year of reservoir operation whereas
 - from the second year onwards these D.O. profiles were found to be independent of K and the initial B.O.D. values.
- The average D.O. in the reservoir is expected to vary from 8.0 ppm to 9.0 ppm over most of its depth.
- The average temperature of the outflow will in general be more than the inflow temperature. The maximum difference is about 7° C and is limited only during winter months whereas during rest of the months it is expected to be much smaller.
- 6 The average D O. in outflow is around 8.5 ppm as compared to the average inflow D O of 8.0 ppm.

This report of the Roorkee University was sent by the Committee to the Wadia Institute of Himalayan Geology, Dehradun, and to the National Environmental Engineering Research Institute (NEERI), Nagpur, for comments. The detailed comments given by these two institutes are annexed (Annexures III.xxviii and III.xxviii).

Essentially both these institutions found the report inadequate in terms of the parameters studied and the methodology used. NEERI also pointed out some inconsistencies in the data given in the report. Relevant extracts from their comments are reproduced below:

COMMENTS OF WADIA INSTITUTE

"The report in reference deals only with dissolved oxygen (DO) and temperature. Though DO is an indicator of water quality for aquatic life but is not sufficient to assess the quality of the impounded reservoir water for different uses. For example, silica content and hardness of the water is important for hydel projects. Other parameters such as bacterial count, BOD and trace metals NO3 and PO4 are also important for aquatic life within the reservoir. Impoundment of water may adversely affect these parameters.

As Stated in the report the impoundment of water in the reservoir would produce vertical stratification and may increase the temperature. Besides having advantages of increase in temperature, the negative aspects of the increase in temperature such as eutrophication should also be considered while evaluating water quality which may in turn reduce the DO level and toxic metals and nutrients may be released with sediments.

It is also not mentioned how DO has been measured. Other parameters of water quality should also be taken into account while assessing quality of water of the Tehn reservoir for different purposes which is likely to be a multipurpose dam.

The report under review does not represent comprehensive Study of water quality report, as commented above. Hence for a multipurpose project like the Tehri this Study needs to be done senously to account for likely impact of impoundment on the water quality of the entire system." [Extract from letter No. 12/17/TC/96-97, dated March 4, 1997, received from Wadia Institute of Himalayan Geology]

COMMENTS OF NEERI

- The rationale and appropriateness of the models used in the Study in preference to the more widely used models such as WASP-4, which can model both temperature and DO simultaneously, needs justification. Further, the Study has been restricted to two physical parameters only, viz, temperature and DO. The actual values used as input data for modeling are not Stated to facilitate a critical review of the results reported.
- It is well-known that the Himalayan rivers carry considerable sediment load, most of which will be settled in the reservoir due to impoundment. Over a period of time, due to biogeochemical changes in the accumulated sediments, the water quality would be affected. When anaerobic conditions prevail in the bottom layers, iron and manganese are reduced and go into solution, sulphates are reduced, hydrogen sulfides are formed and the pH of the water is lowered by the excess carbon-dioxide that is generated. The impact of these changes on water quality could be significant from the point of view of corrosion if the impounded water is used for hydro-power generation.

Depending upon the nutrient inflow into the reservoir, the process of eutrophication may set in with its associated impact on water quality. Apart from possible tastes and odours resulting from increased algal activity due to impoundment, the DO levels in water will also be affected. The modeling studies have not addressed these aspects.

- * The temperature profiles obtained from the modeling studies and depicted in Figs 2 through 16 (Annexure p.14 to 28) do not match with the temperature values reported in the text (p-3).
- As per the modeling studies, the temperature of outflows from the reservoir will be higher throughout the year than that of the inflows, the increase in temperature during winter months being of the order of 6-8°C. Naturally, the DO levels in the outflows should be expected to be less than that in the inflows. However, the trend in DO values depicted in Fig.3 is the reverse i.e. a higher DO value of outflow at higher temperature while the influent DO is less.
- The phytoplankton forms an important link in the food chain affecting the fisheries potential. The impact of impoundment on these aspects has not been addressed." [Extract from D.O. No. WTD/41/97, dated May 3, 1997, received from National Environmental Engineering Research Institute]

In response, the THDC has sent a detailed reply to the points raised by these two institutions (Annexure III.xxix). The position Stated by THDC is briefly as follows:

THDC COMMENTS ON NEERI AND WADIA INSTITUTE REPORTS

The comments received from NEERI and the WADIA Institute have since been examined.

Briefly, the position elucidated on the issues raised by NEERI is that:

- The models used by the University of Roorkee predictions are well known and had been validated on one of the important reservoirs in the world. The same model has also been used by Japanese for water quality modeling studies. Wasp-4 model is only one of the several models available.
 - Regarding bio-geochemical changes, it is clarified that chemical analysis of water of Bhagirathi river at the Dam site shows absence of iron ions, and sulphide ions in small quantities, and as such there would be no likelihood of generation of hydrogen sulphide gas. Also, since limestone and dolomite do not exist in the Tehri submergence area, formation of carbonic acid and resultant temporary hardness of water will not occur. As such, PH value of the water will also not undergo any change.
 - There is no major industry or major city upstream of Tehn reservoir and as such no trophic nutrients are flowing into the reservoir. Therefore, there is no possibility of the process of eutrophication setting in the reservoir.
 - As per UOR Study, the reservoir will get thermally stratified in the 4 months during the first year of its initial filling; the figures of the UOR Report (figures 2, 3 & 4 on pages 14, 15 & 16) indicate the initial first 3 months of the filling. There is no mismatch in the temperature values reported in the text of UOR report
 - DO value of outflow would remain close to the average DO value of inflow and is not directly governed by the temperature change in inflow. Since the inflow may not have the DO at saturation level.

The problem of phytoplanktons is not likely to occur, such problems have not been observed in large reservoirs. In most of the reservoirs, because of growth of algae bio-mass and associated zooplanktons, the nutrition base for aquatic fauna widens, leading to increase in overall fish population in most of the reservoirs. No adverse effect on fish life on account of food chain is envisaged in case of Tehri reservoir. There shall be wide fluctuation of reservoir water levels, in which hydrophilous plants cannot survive. Hence, excessive weed growth is not likely.

Points raised by the WADIA Institute are also broadly covered in the above clarifications

RECOMMENDATIONS

The Committee is not in a position to express authoritative views on the various issues involved. However, they are clearly of great importance and need to be resolved urgently. The Committee would recommend that the MOEF should give careful consideration to the views of the various institutions, arrive at definitive conclusions and formulate appropriate action plans.

The Committee also feels that the possible impact of the construction of the reservoir on the quality of water downstream also needs to be studied.

Further, the possibility of mineral contamination of the water in the reservoir, due to hydraulic continuity, caused by the weight of the impounded water also needs to be examined.

The water quality data should also be communicated to the Zoological Survey of India, the Botanic Survey of India and to other institutions engaged in assessing the environmental impact of the Tehn project, as the water quality profile needs to be taken into consideration by these agencies while finalising their own recommendations.

The Committee also feels that various proposed activities like the construction of a ring road along the reservoir, the construction of shops along the reservoir rim, and cultivation on the draw down area of the reservoir, could have a bearing on water quality. The Committee recommends that remedial measures should be planned for and implemented.

III.7 COMPENSATORY AFFORESTATION

The Tehn project would submerge 2582.9 ha. of forest area. Clearance for the submergence under the Forest (Conservation) Act of 1980 was given by the MOEF vide their letters No. 8-32/86-FC dated 4 June, 1987 and 9 February, 1988 (Annexure III.(xiv)). While giving this clearance, the MOEF stipulated that compensatory afforestation should be carried out on non forest land of equivalent area to that being submerged. This area was to be handed over to the forest department. Accordingly, afforestation was done on 4516 ha. of non forest land in Jhansi and Lalitpur Districts of Uttar Pradesh. (The additional area was on account of the forest land diverted for other project related activities including rehabilitation). Though the Committee did not visit this plantation, the impression that the Committee gathered from the representatives of the MOEF was that the afforestation work had been completed successfully.

Notwithstanding this, the Committee noted that the purposes of carrying out compensatory afforestation should be two First, to ensure that the total forest area in the country, which is

already well below the prescribed level, does not deplete further. Secondly, to ensure that the loss of particular forest types in specific biogeographic zones is compensated for, as far as possible, by planting and regenerating similar forests in the same zone. The Committee observed that, in the case of the Tehn project, the first objective might have been fulfilled but the second had not, as compensatory afforestation for forests to be submerged in the hills of UP was done in Jhansi and Lalitpur, which are not only far away from the site of submersion but also in a different biogeographic zone.

RECOMMENDATIONS:

As the MOEF had approved the location for compensatory afforestation and as the work has already been completed, the Committee cannot fault the Project Authorities. However, the Committee feels constrained to observe that what has been done in this case can hardly be described as 'compensatory' afforestation. Perhaps something can still be done to remedy this deficiency. Without taking a view on whether non forest land is available or not within the region, compensatory afforestation in the real sense can perhaps still be done on equivalent degraded forest land within the same ecological region. This would be in addition to what has already been done elsewhere. The Committee recommends that this should be urgently re-examined by the MOEF. The cost of this further afforestation should not be charged to the project as the Project Authorities have already complied with the MOEF stipulations for compensatory afforestation.

III.8 COMMAND AREA PLAN

One of the major problem of river valley projects in India has been the adverse impacts of impaction water in the command areas, especially through water-logging and the emergence of salinity. Unfortunately, though the Tehri project proposes to impact 8.74 lakh ha. of land in Uttar Pradesh, there has so far been no Study of the possibility of emergence of water-logging and salinity conditions in the command area. As per the response received from the MOEF, the command area plan has yet to be received from the Government of Uttar Pradesh and the Ministry of Water Resources.

Recommendations:

The Committee recommends that the stipulations of the MOEF in its letter of clearance relating to the submission of the command area plan be strictly adhered to. The plan must specifically include measures to prevent the familiar phenomena of water-logging and salinity.

III.9 DISASTER MANAGEMENT PLAN

Even in the most stable of environments there are always risks of disasters. A disaster management plan which incorporates steps to anticipate and prevent potential disasters, to minimise the negative impact of the disasters that may actually occur, and to bring speedy relief to the victims of disasters, is therefore a critical necessity. As the Tehri project is located in an environment which is anything but stable, the need to have a comprehensive and well thought out disaster management plan is even more critical. This was in fact a condition of clearance, but there is no approved disaster management plan as yet.

As per the response of the MOEF, a preliminary disaster management plan was sent to them in April, 1992 and they gave their comments in June, 1992. They say that they have not so far received the revised version of the disaster management plan.

THDC have Stated that the disaster management plan sent by them to the Government of India had been forwarded by the Ministry of Power to the Ministry of Agriculture, the nodal ministry for the purpose; that some clanfications sought had been given; and that the final clearance of the Ministry of Agriculture was still awaited. Be that as it may, it appears that there is no approved DMP in place and, if this is so, it is a serious deficiency, apart from being a failure to comply with a condition of clearance.

Recommendations:

The Committee recommends that, the MOEF, Ministry of Power, and the Ministry of Agriculture should get together and immediately finalise the DMP to the satisfaction of MOEF. Pending such finalisation of the DMP, the conditions of clearance regarding the submission of the DMP, stipulated by the MOEF in its letter giving environmental clearance, should be strictly adhered to. Action plans emanating from the disaster management plan must be finalised so as to be completed prior to impoundment.

OTHER ISSUES

There were certain other issues of importance on which, for a numbers of reasons, the Committee is not in a position to make definitive recommendations. The Committee recommends that they should be examined by the MOEF and corrective actions prescribed.

III.10 DOWNSTREAM IMPACTS

A major dam like the Tehri dam is bound to have significant impacts on the ecosystem downstream of the dam, but no detailed studies of this impact have been carried out. It is necessary to Study what would happen to the aquatic fauna and flora downstream, especially to the fisheries; the availability of water and the recharging of aquifers due to seasonal reduced flow in the river; and levels of pollution downstream during the periods when water flows from the dam would be absent or below the normal levels. As the flow of silt and other nutrients play an important part in downstream ecology, the impact of the reduced flow of silt downstream of the dam would also need to be assessed. THDC have Stated that the flow downstream would be regulated/maintained in various ways, and that there was no need for a special Study of downstream impacts. The Committee, however, feels that such a Study is necessary.

III.11 RESERVOIR RIM STABILITY

The THDC had entrusted to the Department of Earthquake Engineering of the Roorkee University a Study to evaluate the stability of the hill slopes along the reservoir rim, on which villages were located, within 500 meters from the full reservoir level (FRL). On completion, this Study was submitted by the THDC to the MOEF in November, 1992.

The above report indicated that an analysis was carried out to evaluate whether, based on the orientation, spacing and conditions of joints and foliation's, a rock wedge will be formed which could separate and move outward and downward towards the reservoir at each village site. The Study concluded that each village within 500m from FRL submergence line is located on stable hillside and impoundment of reservoir would not endanger their stability. It was further noted in the report that no evidence of failure of ground at the village sites within 500m from FRL had been reported on exposure due to the Uttarkashi earthquake in 1991.

The foregoing 1992 report of the Earthquake Engineering Department of the Roorkee University was referred by the Committee to the Wadia Institute of Himalayan Geology (WIHG) for an independent assessment. Their report to the Committee is annexed at annextureIII.(xxiii). The WIHG report found some deficiencies in the Roorkee University's report, and accordingly recommended that the following further action needs to be taken before the stability of the reservoir rim slopes can be taken as established:

- (a) A map showing the stability classes based on composite geological, geomorphological and geotechnical data needs to be prepared for the Tehn reservoir rim for evaluation of impoundment related environmental change, if any, and remedial measures for averting slope failures, etc.
- (b) Expert comments need to be sought on the geotechnical parameters used in THDC sponsored slope stability Study from leading institutions like Indian Institute of Rock Mechanics, Indian School of Mines, or similar other institutions."

The Committee invited Dr. R.K. Mazan, of the WIHG, who was commissioned to Study and map the Tehn reservoir nm slopes and submitted a report in 1983 with extensive data, to appear before the Committee. The Committee also invited Prof. L.S. Srivastava, who was in the Earthquake Engineering Department of the Roorkee University, and had been associated with the engineering, geological and geoseismological studies of the area around the Tehn Dam site, and Dr. P.C. Nawani from the Geological Survey of India. A gist of the opinions given by the three invitees to the Committee is annexed at annexureIII.(xxiv,xxv, xxvi) to this report.

Recommendation

The Committee recommends that all these opinions and recommendations should be carefully examined by the MOEF and appropriate remedial measures prescribed.

III.12 WATER AVAILABILITY/ DISCHARGE AND SEDIMENT LOAD DATA

In view of apprehensions expressed by the people of the Bhagirathi valley about the availability of water for their future drinking and imigation needs once the Tehri Dam comes up, as well as doubts about declining river flows and the adequacy of water for downstream projections for generating power, drinking water and imigation and about the sediment load data, the Committee sought the relevant information needed for an independent assessment of these two important aspects of the Project.

For a comprehensive picture of the water budget, it was necessary to obtain the requirements of water for power generation, drinking water and imigation and compare it with the average availability on a 24 hour basis. This important information has not been made available to the Committee. It will, therefore, be difficult to come to any conclusion about the adequacy of water for purposes proposed by the Project Authorities and also to meet the present and future drinking water and imigation needs of the people of the Bhagirathi valley.

The water discharge and sediment load data to cover a 23-year period from 1971 to 1994 was finally obtained in April '97 from the Central Water Commission, and the Wadia Institute of Himalayan Geology was entrusted with an independent evaluation of the data. The report of the WIHG annexed at annexure III.(xxxvii) finds some inconsistencies in both the water discharge and sediment load data. Accordingly, the report makes the following recommendations:

1. An extensive network of water stages and sediment recording stations needs to be established at the mouth of every perennial stream confluencing with the Bhagirathi and the Bhilangana rivers. Water stages may also be established at the intake points of major acquiducts or canals in the Tehri catchment. In broader terms, every surface flow needs to be monitored to allow meaningful calculations of water budget which includes seepage losses as well. Data recording of water discharge and sediment deliver should be carried out on regular basis even after the supposed commissioning of the Project to permit periodic estimates of reservoir sedimentation and detection of declining water trend, if any. The greatest advantage, among other things, in establishing the extensive network of water stages and sediment recording stations would be to develop an understanding about the erosion pattern of the various subcatchments of the Bhagirathi, so that remedial measures can be adopted to arrest the excessive erosion, in the identified subcatchments, vis-a-vis, sedimentation of the reservoir

- 2. Care is to be observed with respect to methodology as laid down in the UNESCO. (1985) manual on the estimation and monitoring of reservoir sedimentation. Sampling techniques and methodology must be sharpened and applied uniformly at all the water stages and sediment recording stations. Sampling in particular should be done with high precision as this is vital to sediment load calculations.
- 3. It is high time that tracer studies are conducted on bed load movement to derive confident values for sediment delivery estimation. Often this is taken as some vague percentage of suspended load which is misleading as illustrated by assumed rates of siltation of the various reservoirs having been exceeded several times by the actual (measured) rate of sedimentation.
- 4. It is absolutely essential that weather recording stations (particularly rainfall, snowfall) are also established at various nodal points in the Tehri catchment (including Devprayag). Such stations should preferably be automatic so that large data bases are developed with a high precision. Weather data is extremely significant for analysing relationship with the hydrographs and general response of ground attributes to the prevalent climatic behaviour. This is an intrinsic part of the methodology for monitoring the external energy system and should not be ignored at any cost."
- 5. The note on Silt load estimation at Tehn & Life of the Tehn Reservoir by the THDC is annexed at annexure III.(ix, xxxviii). A summary is given below.

The CMD, THDC, Stated that the water discharge and sediment flow in major rivers is independently monitored by the Central Water Commission and the data is compiled and maintained by them; the water discharge data, being of secret nature, is not readily accessible. It is, therefore, not known to THDC as to in what form the data has been collected from the Central Water Commission. In any case, analysis of this voluminous daily discharge data, covering more than 20 years, would normally take quite sometime to properly assess it and reach conclusions and therefore, it would not be proper to draw conclusions merely based on some perceived discrepancies in some of the figures. According to CMD, THDC, it is quite likely that the Wadia Institute may not have been able to fully appreciate the data. In THDC's view interaction was, therefore, needed atleast with the Central Water Commission in analysing the data and before offening conclusions. The THDC's detailed comments on the observations of WIHG are given in the note annexed (III.xxxviii).

CMD, THDC, further apprised that the Central Water Commission started observing rate of silt flow in river Bhagirathi at Tehri Dam site from the year 1973. Based on actual observations on silt inflow in the river Bhagirathi from 1973-88 at Tehri Dam site, a Study was made in the year 1989 and it was found that the average inflow of sediment into the river was 14.86 ha. metres per 100 sq. k. per year. Taking this rate of silt inflow, it has been found that the life of the reservoir would be over 160 years which is more than the design life considered for the Hydro-Electric Projects. The silt rate based on the extended data from the year 1973 to 1993 has reduced to 13.71 ha. meters per 100 sq.km. per year as compared to 14.86 ha. meters per 100 sq.km. per year estimated on the basis of 16 years data. The siltation rate is also expected to come down after implementation of CAT programme, which would further enhance the useful life of the reservoir. For economic appraisal of a storage project, the normal design life of the Project is taken as 100 years.

Recommendation

The Committee recommends that these two important aspects of water availability and silt load estimation should be carefully examined by the MOEF and appropriate action plans laid down.

CHAPTER - IV

IV - EMPLOYMENT AND INCOME GENERATING SCHEMES

The Committee Members during their visit to various sites, including the Tehn Town, resettlement colonies and the affected villages, heard the people and received representations. There was a general demand of the people of the area for employment. There is considerable unemployment in the local youth due to lesser opportunities of employment in the area. This aspect was discussed by the Committee at length and has been dealt with in the following sections:

I) Direct Employment

- a) Employment by THDC
- b) Employment by Contractors engaged by THDC
- c) Employment by other Government Agencies

II) Indirect Employment Opportunities

III) Self Employment & Income Generating Schemes

IV.1 DIRECT EMPLOYMENT

a) Employment By THDC

It was noted by the Committee that when the Project was being implemented in the State Sector, the Govt of U.P. had intended to provide employment to one member of each affected family, though very little was done in this direction by the State Project Authorities till the project works remained with them. The project, including rehabilitation was transferred to THDC in 1989-90.

It is recognised that the THDC does not have large scale employment opportunities, as its requirements are limited and mostly in the specialised categories. It is indicated by THDC that even after the project gets commissioned, the requirement of operational staff would be extremely limited. It has further been noted by the Committee that as per Policy of the THDC, preference in employment in available vacancies is given to the dependents of the displaced families subject to their meeting the laid down qualifications and experience requirements.

The area-wise break-up of the employees working in the THDC is as under:

	tegory of policyees	Area	Other parts of Tehri Districts	Other Garhwa Districts	Areas	
)	Executives	24	15	34	209	282
1)	Supervisors	63	76	29	35	253
iii)	Workmen including clerk staff skilled & unskilled work		300	247	631	1490
(۷۱	Deputationist	s 13	23	10	45	91
		412	414	320	970	2116
	cent offers	52			2	5-4
To	otal	464	414	320	972	2170

Out of total 2170 persons, 1090 persons came from UPID/UPSEB. It was also observed by the Committee that during the past few years THDC is giving employment as far as possible from the Tehri District in the Workmen & Supervisors category. The employment given during THDC's tenure is about 61% (492 out of 801) from the Tehri District, besides about 125 from other Districts of Garhwal Region.

The Committee is of the view that the existing Policy of giving preference in employment to the project affected persons, particularly in the category of workmen and supervisors, may be continued. However, it has been felt that there are limits to giving preference in employment to the people from the other Districts of Garhwal Region , as the idea behind preference is to compensate the people who have got displaced or have been affected by the project.

A point was raised during discussions that in case the present Policy of filling of the backlog of SC/ST reserved vacancies is not insisted upon, the THDC can further employ additional man-power from the Tehri District. However, it was noted that, being the national Policy, the reservation for SC/ST is being enforced as per the Govt. guidelines.

During the visit of the Committee the people wanted that employment be given to one member from each affected family as per the orders of U.P. Govt. The Committee went through various orders of U.P. Govt. for providing employment. It is noted by the Committee members from the various U.P. Govt Orders that these orders, inter-alia, provide the guidelines for employment in various industrial units owned by it in terms of which the local people of the area where the project is being constructed are to be given employment preferentially. The Tehri Project was transferred from Govt. of U.P. to THDC as a Govt. of India and Govt. of U.P. Corporation in 1989. The Govt. of U.P. orders do not impose categorically any obligation on the part of THDC to give employment to at least one member each of the dispossessed family. A GOI's order dated 03.02.1986 stipulates that ' any understanding, formal or informal in regard to offer of appointment, to one member of every dispossessed family in the Project will stand withdrawn. However, with a view to encouraging the dispossessed families taking to useful avocations like poultry farming, animal husbandry, the Project Authorities will assist the concerned State Government in organising and financing such activities. The basic responsibility of initiating such schemes will be that of the State Government.

b) Employment By Contractors

i) Major Contractors

After deliberations, the Committee felt that the major contractors working in the project should be asked to employ a certain percentage of local persons in the category of unskilled workers, clenical staff and supervisors from the Tehri District, if available. The percentage to be recruited on the project from the Tehri District, including the persons shifted from submergence area, should be 40%. The Committee recommends accordingly. The persons employed by contractors may be kept on probation for three months and depending on their performance being satisfactory during these three months, they could be continued further on the job.

ii) Small/Petty Contracts

The Committee is of the opinion that, in order to provide gainful employment to the local population, the THDC may award small value contracts, say upto Rs.50,000/to the local people, for which a roster could be maintained by the project and work awarded senally, subject to the completion of the earlier work satisfactorily. These local contractors should be under obligation to employ the workmen exclusively from the submergence area, for which the desired record may be maintained by them. Violation of this condition should entail black-listing of that contractor for award of all future contracts by the THDC.

c) Employment by other Govt. Agencies

The Committee felt that for the treatment and soil conservation work in the Catchment Area, the Forest Deptt., Rural Development Deptts, etc. will need to employ more persons. The Committee recommends that the State Govt. may give preference in future employment for such and other works to the local affected persons of the Tehn District, including those who have got re-settled in the resettlement colonies.

IV.2 INDIRECT EMPLOYMENT OPPORTUNITIES

With the construction of the New Tehri Town at a high altitude, formation of reservoir, better road network etc., it is expected that there will be an all round development in the area, which will enhance the employment opportunities due to setting up of new non-polluting industries, better tourism opportunities, and other commercial activities. Allthese will contribute to increase in employment opportunities through developmental activities, which will in turn help in generating indirect employment in commercial ventures, like boating, transport, vehicle repair shops, business, hotel industries and several other indirect activities.

IV.3 SELF EMPLOYMENT/INCOME GENERATING SCHEMES

Since it is not possible to employ all the unemployed youth in the project, Committee recommends that these youth be provided necessary help and guidance in engaging in suitable self employment opportunities. In addition to this, there is need to introduce income generating schemes for the Project Affected Families so that they can further improve their living standards.

The Committee would classify employment/income generating schemes into following two categories:

- i) For the people who will continue to remain above the reservoir rim In the category, people can be benefitted:
- (a) from the Watershed Management Schemes by involving local people, which will create employment opportunities;
- (b) from other schemes like, horticulture, fisheries, poultry farming, sericulture, bee farming, dairy farming etc. through self employment (A sample list of such schemes is given at *Annexure IV.1*).

The responsibility for Watershed Management will be of the Forest Deptt. For other schemes the services of NGOs could also be provided by THDC, who will work as facilitator for guiding/training the people, providing assistance for getting loans from banks/other Govt, agencies, and helping in marketing etc. through schemes run by State Govt, for a period of 5 years.

ii) For the people who shift to re-settlement colonies

In order to improve the quality of life, these people should be provided help in taking up works in various schemes introduced by the Govt. of U.P., like, poultry farming, horticulture, floriculture, agriculture cash crops by introducing improved varieties of cereals, oil seeed, vegetables, fruits, roses and for helping in better performance through the use of drip irrigation, adopting proper crop pattern, use of mechanisation etc.

Committee also recommends that propagation of cold water pisciculture in Garhwal Mandal should also be thought of and a plan should be worked out for the training of villagers in pisciculture.

Committee also feels that it is advisable to arrange for the navigational training of the young people from the villages around the Dam. This will help the local people to take up the navigational activities to earn their livelihood after the construction of the Dam, which will also put a brake on the fleeing of persons from Garhwal Mandal.

Committee recommends that in Pathri 3-4 revenue villages may be made so that P A Fs may lead their lives socially and economically as they were having In Garhwal. Sufficient water may be provided In Pathri, Raiwala and Bhaniawala for dairy farming, floriculture, apiculture and sericulture and other paying business from the cultivation of herbs etc..

Other income generating schemes for women, like handicraft work, khadi work, cottage industries, envelope making, tailoring etc. etc. could also be started.

The interested PAPs may also be helped by the NGOs, who could be engaged by THDC for guiding the people as facilitators and to help them in getting training/taking loans from banks/other Govt. agencies, marketing etc. for a period of say 5 years. A sample list of activities which can be taken up in re-settlement colonies is given at Annexure IV.2

NGOs will act as catalysts in propagating value added agricultural activities in the area by involving the people. They will also help in opening of growth centres with the help of State Govt. The NGOs will motivate the people by holding village level meetings so that some people come forward as rural entrepreneurs who may engage other villagers as their employees, while some others can be trained to take up marketing activity for these entrepreneurs. For this purpose, if possible, pilot projects can be arranged by the NGOs under various State Govt. schemes. In addition, the NGOs can help in training some young and energatic people as tourist guides, in mountaineering, hiking etc. NGOs will also prepare a data base on people, unskilled, skilled with type of skill etc..

These are essentially preliminary recommendations. The THDC should commission an appropriately qualified NGO or Institution to develop a detailed plan for employment generation, in collaboration with the PAPs. Such a plan must be based on a proper assessment of market potential, the skills and inclinations of PAPs, the social and economic sustainability of each activity, and the availability of finances, technology and training opportunities. The roles of various agencies in developing such employment opportunities should be clearly spelled out and agreed to by them in writing. Resources required for implementing the plan must also be earmarked and its availability assured. The implementation of the employment generation activities must also involve

CHAPTER - V

V. INSTITUTIONAL MECHANISM

V.1 INTRODUCTION

For the purpose of rehabilitation and resettlement of about 10,000 Fully Affected Families (urban & rural), besides 4,279 Partially Affected Families, a compact and a well defined organisational set up, with clear demarcation of areas of responsibility is required. In addition, it is necessary to have a suitable and an effective mechanism for monitoring the resettlement and environmental aspects, including implementation of environmental action plans.

The Committee reviewed both the set ups, the old one under the State Government and the present one under THDC, and based on its perceptions and needs of the situation, the Committee has proposed some modifications in the institutional arrangements connected with rehabilitation.

V.2 CONCERNS OF THE COMMITTEE

Adequate and timely rehabilitation of PAFs should occupy centre stage in the construction of a dam and should at least go pan-passu with the construction, if it is not possible to take advance action for the same. As this has not been carried out with the desired speed, the PAFs, are today a disillusioned lot.

Lack of transparency and proper planning are other areas of concern.

The implementation mechanism for rehabilitation should, therefore, take care of both these aspects.

Rehabilitation work can further be sub-divided into two main aspects connected with presettlement (shifting) and post-shifting activities respectively.

Pre-shifting activities consist of land acquisition (including land proposed for rehabilitation), valuation of structures, payment of compensation etc. while the post-shifting activities will deal with infrastructural facilities and their future maintenance and a mechanism to look after the income generation and skill upgradation activities of the PAFs and to advise them suitably.

Land acquisition and site development of the land proposed for rehabilitation are very often the limiting factors to the plans for timely rehabilitation besides other factors like the will to proceed with the construction of the dam and the consequential flow of funds being assured. Shortage of Land Acquisition Officers is invariably cited as the main reason for the delay. Contractual re-employment of retired, energetic and motivated officers vested with necessary powers could provide relief. Similarly direct control over the agency utilised for the site development activities also will lead to timely rehabilitation.

V.3 PAST SET UP UNDER THE STATE GOVT.

- Till 1989, Tehri Dam Project was being implemented by the Irrigation Department of 3.1 the Govt. of U.P.. Comissioner Garhwal Division was notified as the Administrator of the Project looking after rehabilitation and other related activities, under whom the rehabilitation Wing was constituted as under:
- Director, rehabilitation 1. IAS Officer in the Senior Scale 2.
- Town Administrator Sr. PCS Officer
- 3. Assistant Town Planner
- 4. Upnivesh Adhikari PCS Officer 5. Public Relation Officer PCS Officer 6. S.LA.Os.
- 2 Nos (These officers were supported by the staff as per sanctioned strength.)
- 7. PWD Division with staff as per norms
- 8. Irrigation Divisions 6 Nos. with staff as per norms
- For economic, efficient and expeditious implementation of the Project, a Tehri 32 Control Board was constituted by the State Govt., under the Chairmanship of the Chief Minister, Uttar Pradesh, with Irrigation Minister, Power Minister, State Minister for Power, State Minister for Irrigation, State Minister for Hill Development, Chief Secretary alongwith Commissioners, Secretaries and Chief Engineers etc. of the various concerned departments, as Members,. Under the Tehri Control Board, a Standing Committee was functioning for monitoring the physical and financial progress. The Control Board also assisted the State Govt. in framing policies for rehabilitation and other aspects pertaining to the Project by laying down guidelines.

PRESENT SET UP UNDER THDC V.4

- After the Tehri Dam Project was taken over by THDC, in 1989-90, this mechanism was given up and Commissioner, Garhwal Division, although still chairing the Co-ordination Committee, is not associated with the actual rehabilitation work, which is being attended to by various agencies with the overall responsibility resting with THDC. matters, including implementation reviews, lie with the Board of Directors of the THDC. For The overall Policy purposes of implementation, rehabilitation and environmental matters are assigned to one of the Directors of the Corporation, in addition to his other functions. Further, for the purpose of implementation of the R&R, THDC has formed two wings, viz. Urban rehabilitation and Rural rehabilitation, headed by an Addl. General Manager (Urban rehabilitation) and a Dy. General Manager (Rural rehabilitation) respectively with both reporting to the General Manager (Project). The rural resettlement colonies located in Dehradun and Haridwar Districts are being looked after by two Managers/Dy. Managers headquarters at Rishikesh and Dehradun, reporting directly to the Dy. General Manager (Rural rehabilitation).
- Although THDC is responsible for rehabilitation and resettlement of both rural as well 4.2 as urban PAFs, but there are a number of important areas in which the State Govt. Offices/Departments have to extend a helping hand, like acquisition of lands, valuations and disbursements of compensations thereof, shifting of the population etc...

V.5 PERCEPTIONS OF PAFS

- 5.1 Whatever rehabilitation has been carried out so far has been implemented by the aforesaid mechanism of the U.P. Govt. and THDC has not been able to add to it. The acquisition of land by Govt. is often advanced as the reason for delay. Uncertainty about the construction of the Dam and the consequential problem about flow of funds appeared to be main reason for the delay resulting in total despair on the part of PAFs.
- When rehabilitation work was being looked after by the Director of rehabilitation, people complained of delay and the unhelpful attitude. The same continued today also, with the difference that people were more vocal now and felt frustrated at what they perceived to be an endless misery on account of unfulfilled commitments. During the visit of the Committee to the submergence areas people complained that the officers engaged in rehabilitation action were not only unsystematic but were also not available in their offices, which made them apprehensive about their future. Earlier also, majority of people had expressed preference for an IAS Officer supervising the rehabilitation work.
- 5.3 Non-conferment of land titles, particularly to urban population, even in respect of lands/plots/flats and shops etc. allotted to the PAFs long back, is preventing them from availing loans from financial institutions and undertaking construction of houses, or having built up houses and shops transferred in their names.

V.6 RECOMMENDATIONS

6.1 The Co-ordination Committee chaired by the Commissiner Garhwal Division has Chairman of both the Nagar Palika and Zila parishad Tehri as members, suitably strengthened as under, it would perform the functions, laid down in para 6.2

•	Commissioner, Garhwal Division	-	Chairman	
•	CMD, THDC		Co-Chairman	
•	District Magistrate, Tehri Garhwal	Men	Member	
•	District Magistrate, Dehradun	-	11	
•	District Magistrate, Haridwar	_	44	
•	Conservation of Forst concerned with CAT	_	46	
•	Chairman, Zila Parishad, Tehri		44	
•	Chairman Nagar Palika, Tehri Town	-	66	
•	M.L.A. Project Area	_	4.6	
•	Block Pramukhs (Bhagirathi & Bhilangana			
	Valleys & Pratap Nagar Block)	-	44	
•	2 Women Gram Mukhias, 1 each from	*		
	Submergence and resettlement area		44	
•	Representatives of 2 NGOs/Institutions to			
	be coopted by the Chairman	-	44	
•	Representatives of State Govt. in the Departments			
	of Revenue, Irrigation, PWD, Urban Developm			
	and Institutional Finance	_	44	
•	Director, rehabilitation	-	Member Secy.	

- 6.2 The Co-ordination Committee will perform the following functions:
 - a. Co-ordinate with the various concerned deptts, of the State Govt, for works which relate to the Project.
 - b. Help the Project Authorities in land acquisition.

- c. Help the Project Authorities in shifting the Tehri Town so that law & order does not get disrupted.
- d. Get necessay reports from THDC from time to time and follow them up.
- e. Consider general grievances of the public related to their rehabilitation/resettlement.
- 6.3 The Director of Rehabilitation who will be a Senior Officer in the IAS will be responsible for the entire rehabilitation and resettlement work and will exercise complete control over all the officers and staff of the various departments involved in the implementation. Director's team would be manned by Officers of the U.P. Govt., if necessary on deputation to THDC, so that these dedicated lot of officers could work with a sharper focus.
- 6.4 The Director of Rehabilitation would work as a full time Officer on deputation to THDC. He could work out the size of his team after assessing the speed with which rehabilitation and construction works are to proceed. In order to ensure that rehabilitation matters receive the importance that they deserve, it would be desirable to nominate Director of Rehabilitation to the THDC Board, which would then benefit from the first hand account of both the progress and problems of rehabilitation.
- There should be one Monitoring Committee for rehabilitation and environment to be chaired by Secretary, Environment & Forests, GOI, constituted by and large on the pattern of Narmada Control Authority sub-group.

The Monitoring Committee shall perform the following functions:

- Monitor the implementation of the conditions of clearance, as stiipulated by the MOEF, and to advise MOEF on their compliance.
- ii) Monitor whether the environmental and rehabilitation work of the Project is proceeding pari-passu and recommend remedial activities, where required.
- Take an overview of the environmental and rehabilitation aspects of the Project and recommend additional studies and where required take action to enhance these aspects of the Project.
- 6.6 The Coordination Committee should set up a Grievances Redressal Cell, independent of THDC, which should include women members and NGO representatives so that the cell acquires a stronger focus while dealing with the resettlement of PAFs with special emphasis on the rehabilitation of women and upgradation of their skills.
- 6.7 A large number of representations have been received by the Committee considering the strong sentiments of these Project Affected Persons. The Committee recommends that these representations may be handed over to the proposed Grievances Redressal Cell for careful consideration.
- In order to ensure transparency, the Coordinating Committee should from time to time, but at least once in 6 months, organise in different places, preferably through NGOs or other independent institutions contracted for the purpose, public hearings where details of past and proposed rehabilitation activities would be made public. This would include list of PAPs, valuation of their assests, details of the compensation package provided, the details of the various steps taken, etc..

Other issues to be included in such public hearings would be identified, from time to time, by the Monitoring Committee and by the Coordination Committee.

CHAPTER - VI

VI. CONSOLIDATED RECOMMENDATIONS

Given below are the recommendations consolidated from various Chapters

VI.1 REHABILITATION

I. Advance against Land to be Acquired in the future

In order to avoid infiltration of outsiders to buy/obtain land and claim for rehabilitation benefits, GOUP issued a notification limiting transfer of lands. This restriction on sale of land has resulted hardships in meeting expenses related to marriage, death, disease and other occurrences in a few families. Sale of land would have deprived them of the rehabilitation benefits. Families whose lands are yet to be acquired have requested financial assistance to meet exigencies.

Recommendation: The Committee recommends that families with land may be permitted to draw an advance to be adjusted from compensation money payable at the time of acquisition of land. The PAFs should be given an advance limited to 25 % of the cost of their land holding or Rs. 100,000, whichever is less. The advance shall carry a 12% interest rate. For this purpose THDC will create a fund of Rs. 2 crores.

II. Definition of Family and rehabilitation Provisions

The basic rehabilitation provisions (land, houseplot, and other benefits in case of affected rural families; house/houseplot, shop and other benefits in case of affected urban families) outlined in existing R&R Policy to *entitled fully affected families* will remain unchanged (Policy note is attached in annex il.1).

The recommendations outlined in this section specifically relate to the following: definition of family, cut-off date to identify individuals eligible to be termed as independent families and receive rehabilitation provisions; level of land and cash provision; and provision of houseplots, eligibility to receive constructed shop and house construction assistance in NTT. All other aspects including community provisions remain as specified in 1995 R&R Policy. The Committee recommends a new definition of family thereby enabling additional members to become eligible for rehabilitation provisions. The recommendations given below pertain only to the additional members becoming eligible to receive rehabilitation provisions.

III. Definition of Family and Cut-off date to decide Family

In case of Tehri project, the review Committee recommends a new definition of family.

All the sons and unmarried daughters of the entitled fully affected families who have attained the age of 18 years as on 19.7.1990 are recognised as independent families and will be eligible for rehabilitation provisions defined below. This cut-off date will remain in place upto 18. 7. 2002.

For those entitled fully affected families not offered rehabilitation provisions by 18. 7. 2002, the cut-off date to determine eligibility (i.e., attainment of 18 years of age) shall be reckoned as on 19.7 2002. All sons and unmarried daughters in such entitled fully affected families who have attained the age of 18 years as on 19.7 2002 are recognised as independent families and will be eligible for rehabilitation provisions defined below.

This new definition of family (recognising major sons and major unmarried daughters as independent families) will be applicable to all fully affected families: to those fully affected families who have already been displaced and shifted to new area or awaiting shift to new area; as well as those awaiting displacement and resettlement in a new area.

Level of entitlement to rehabilitation provisions:

- The married major sons are considered as full units to receive rehabilitation provisions defined below;
- The major unmarried sons and major unmarried daughters are considered as half units to receive rehabilitation provisions defined below.

IV. Recommendation of rehabilitation Provisions for Newly Recognised Families of original Fully Affected Families

1. Rural Families: Those Already Displaced

For past cases where family has already been shifted

 As regards past cases where the rehabilitation has already been done, for newly recognised additional families the Committee recommends that only cash amount be paid instead of land. The cash option is recommended considering lack of land available for rehabilitation. The major married sons receive Rs. 150,000 and the major unmarried sons and major unmarried daughters receive Rs 75,000.

2. Rural Families: Future Displacement Cases

In cases where family has not shifted/given rehabilitation benefits, for newly recognised additional families:

- The Committee recommends that only cash amount be paid instead of land. The cash
 option is recommended considering lack of land available for rehabilitation. The major
 married sons receive Rs. 150,000. The major unmarried sons and major unmarried
 daughters receive Rs 75,000.
- For residential plot. Rs. 3300 or 200 sq.mt. residential plot in a rural rehabilitation centres on cost will be given to each major married son.
- Existing scheme for grant of interest subsidy on loan for construction of house is recommended.

V. Families in Partially Affected Villages

The families whose 50% or more land is being acquired are being treated as 'fully affected'. Those whose less than 50% land is coming under submergence and is being acquired are categorised as partially affected and are not to be settled at new rehabilitation sites. For determining the entitlement as 'fully affected', or 'partially affected', weightage is being given for the type of land holding to the extent of 1:1.5:3 for class II (unimigated), class I (unimigated), and imigated land, respectively.

(i) Villages where 75 % or more families are fully affected shall be considered as fully affected villages. In the partially affected villages (where less than 75% families are fully affected), the fully affected families will have the option of resettling elsewhere with rehabilitation provisions or remain in the unaffected part of the village. The families that remain there will be allotted land on pattas from the left over surplus land.

- (ii) For newly recognised additional families of fully affected families from partially affected villages, major married sons, major unmarried daughters and major unmarried sons are entitled to receive cash amount instead of land, considering lack of land available for rehabilitation. The major married son receive Rs.1,50,000. The major unmarried sons and major unmarried daughters receive Rs.75,000.
- (iii) In addition, the following provisions will be implemented:
- 1 Development of rim of the reservoir will be according to recommendations under CAT section in chapter III;
- 2. Ring road to be constructed, subject to environmental safeguards defined in chapter III;
- 3. Any additional cost for providing drinking water directly attributable to the Project will be met from the Project funds.
- 4. Development of micro-watersheds in the catchment area to be implemented by local people as per CAT plan. The details of which are given in chapter III;
- Rural shop owners of such area will be given shop plot on cost closer to ring road.
 Development of shops will be subject to environmental safeguards
- VI. Rehabilitation Provisions for Affected Urban Families
- (i) Shops to shopowners who are not running the shop(s).
- 1. According to existing Rehabilitation Policy, if the shop owner is not running the shop but given to any other party for running the shop, the owner gets compensation for the land and structure. However, the Policy provided a shop on payment of cost to the tenant. In such situations, as the owners felt seriously deprived, in order to amend deprivation felt by the shop owner, the Committee recommends the following:

One constructed shop be given on cost to a shop owner who is not running the shop. For each additional shop owned by the same person but not run by him/her, he/she will be given Rs. $40,000^2$.

- (ii) House Construction Assistance for Urban Families.
- (a). To all entitled fully affected families in old Tehn town, house construction assistance be paid as grant to landowners (other than benap³) at the rate of:
- Rs 60,000 to those allotted 60 sq. mt. house plot.
- Rs. 1.2 lacs minus compensation paid, subject to a minimum of Rs. 60,000, to 100 -200 sq. mt. plot holders &
 - Rs. 1.8 lacs less compensation paid, subject to a minimum of Rs. 60,000, to 250 300 sq. mt. plot holders.

In New Fehri Town, development cost for a shop is estimated at Rs. 40,000. The tenant pays only cost of the structure but not the development cost. When the owner is not given additional shop(s), she/he is given the development cost (Rs. 40,000) as grant.

Benap meant encroacher

This amount will be paid in accordance with progress of construction and shifting. This provision is also applicable to those who have already constructed their houses and shifted, and those not yet shifted.

- (b). House construction assistance to each major married sons and major unmarried sons and major unmarried daughters⁴ at the rate of Rs. 60,000 Payment of this amount is linked with the progress of construction and shifting
- (c). Since the entitled fully affected families and newly recognised additional families are given grants to make house, they will not be entitled to loan with subsidy on interest.

VII. Other Points Considered by the Committee

For rehabilitation, land may also be purchased through direct negotiations and not only through acquisition (as acquisition may lead to litigation and time consuming and entail higher cost because of payment of solatium etc.). However, as far as possible, in making private purchases through direct negotiation, it must be made sure that sufficient land is available to resettle all families from a village or hamlet together as a social unit in one place. In order to maintain social fabric, land in big chunks be purchased, so that a large number of families can be settled together.

The committee recommends that valuation of trees be made taking all its uses and number of years of benefit from a tree into account.

VIII. Grievances of People in Resettlement Colonies and Affected villages

A complete analysis of the grievances of the people, expressed in written and oral form in resettlement colonies and affected villages was carried out and presented in Annex II.3 and Annex II.4.

Issue of Corruption: While the issue of corruption was not within the purview of the Committee, nor was the Committee in a position to investigate the incidence of corruption, it would not be proper for the Committee to ignore the fact that throughout its visit to the project area, the villages in the submergence area and the resettlement colonies, complaints about corruption at various stages in the process of displacement and rehabilitation and formed a recurring theme in the representations made to it. The Committee would like to draw the Government's attention to this widespread perception and to recommend that the Government should appoint a Committee to examine the incidence of corruption, and then take prompt remedial action.

IX Rights of People in upstream Villages over water from Bhagirathi and Bhilangana and tributaries draining in these rivers.

The Committee acknowledged the point that construction of Tehn Dam should in no way affect rights of people in villages upstream of Tehn reservoir over water from Bhagirathi and Bhilangana rivers and tributaries for drinking and imgation purposes. These rights should be recognised and honoured. Water use for imgation may be through lifting, construction of small dams and other methods. Any attempt to deny water to local people will be violation of their rights.

¹ Here, definition of major sons and daughters remains the same as that defined above (III). Further, as mentioned in III, for those entitled fully affected families not offered rehabilitation provisions by 18.7-2002 the cut-off date to determine eligibility (i.e. attainment of 18 years of age) shall be reckoned as on 19.7-2002. All sons and unmarried daughters in such entitled fully affected families attaining the age of 18 years as on 19.7-2002 will be recognised as independent families and become eligible for rehabilitation provisions.

Identification of major sons and major unmarried daughters

One of the major problem in operationalising the new definition of family arise from absence of baseline data on affected families at the time of issuance of section 4(1) notice or at any other time. However, this problem can be tackled with other data base. The household form of 1991 census is the most promising source of data. The census date is very close to the cut-off date (19, 7, 1990) to decide new families. The age, sex, marital status of each member normally resident (including out-migrants) in the household at the time of census is available for each household. The census household composition data can be verified by a reputed independent agency. It is within the powers of the State Government to make special request to the Registrar General of India, Ministry of Home Affairs, Government of India to release household composition data.

If census household data is not forthcoming from the Registrar General of India, the Government should appoint an independent agency to conduct a comprehensive survey in all affected villages and resettlement colonies.- The agency will use other databases, such as voters list, BPL survey of State Government, and others.

The Committee felt that women should share in the rehabilitation benefits given to men. Thus, the Committee recommended that henceforth all rehabilitation provisions (land house / house plot and cash provisions) should be given and registered jointly to both spouses.

VI.2 ENVIRONMENT

In general, the Committee considers that the practice of according environmental clearance to projects before all necessary studies have been completed and the environmental viability of the project established, is not a healthy one. Also, the economic implications of implementing the required environmental safeguards must be fully assessed and taken into consideration while according economic clearance.

Also, environmental clearance should be given only for a specified period, say two years, at a time and the Project Authorities must subsequently have the clearance renewed based on their record of compliance with environmental safeguards. The Environment Protection Act must also be made more effective so that responsibility can be fixed and deterrent action taken against those who are responsible for not complying with the conditions of clearance.

The Committee recommends that the MOEF should prescribe, for itself, a time frame within which reports submitted by the THDC should be examined and disposed of.

Some members are of the view that, for the Tehri project, the picture that emerges from the report is that the project was neither properly assessed from the environmental angle, nor properly costed in terms of environmental and rehabilitation requirements, before clearance, albeit conditional, was accorded. They also consider that many of the required environmental studies have still not been satisfactorily completed.

These members are further of the view that, once the studies are completed, the environmental and economic viability of the project should be reassessed; and that the work of the project must be suspended till such an assessment is completed, and the project only allowed to continue if found viable.

However, the majority of the Committee disagrees with this view. It also feels that this is beyond the terms of reference of the Committee and that, in any case, the types of studies being done are not designed for examining the viability of the project.

Catchment Area Treatment

The Committee recommends the following.

- The degraded areas, both forest and non-forest, with very high and high levels of erodibility, should be treated in the entire catchment of the Tehri Project and not just in the 'directly draining' portion. These must be treated at project cost and their treatment must be completed before impoundment starts.
- Catchment area treatment should not be restricted to small patches but each of the micro water sheds (MWS), where patches of very high and high level of erodibility occur, must be treated in its entirety, including the non forest areas in that MWS.
- The total area needing treatment has been tentatively estimated to be 740.15 sq km of forest and non forest land. The details are as given in the table below. These figures, however, need to be finalised by reconciling the various data bases and updating the data.:

Estimated area needing treatment (sq km)

Erodibility class	Forest		Non forest	
	1 Total area	2 Area to be treated	3 Total area	Area to be treated
Slight/moderate	1239.16	61 96 (5% of 1)	780.77	156.15 (20% of 3)
High/very high	441.57	441.57 (100%)	80.47	80.47 (100%)
Total area to be treated		503.53		236.62

An area of 293.50 sq km of high and very high erodibility forest area has already been treated, though some of this might need to be retreated, as specified earlier in this section. On the other hand, area already adequately treated by any other agency or through any other programme should not be re-treated. The total cost of treatment of this catchment area, as calculated by the UP Forest Department, comes to about Rs. 90 crores, in addition to what has already been spent.

4. The treatment of the very high and high erodibility categories of land must be done in accordance with the recommendations of this Committee, at project cost and pan passu with the engineering works so as to finish before the start of impoundment

- In addition, the Committee recommends that the remaining MWS in the Tehri project catchment, with areas of only medium and low category of erosion, should also be taken up for treatment. This area has been tentatively estimated to be 780.77 sq km of non forest land and 1239.16 sq km of forest land, though only a part of it, as tentatively estimated in the table above, will need treatment. The Committee recommends this because it thinks that there is no justification for ignoring such areas, as in the absence of treatment, they would continue to degrade and soon reach very high and high levels of erodibility. While such areas need not be treated at project cost, treatment should be ensured.
- The Committee recognises the need to treat the catchments starting from the top and progressing downwards, i.e., from the ridge down to the valley. Therefore, it recommends that the CAT activities be taken up from the ridges irrespective of whether the MWS at the top of the ridge is a part of the area that has to be treated at project cost or not. Also, the activities should start from the MWS nearest to the dam site and then progress outwards.

In order to apportion the costs between the project and other sources, and assess whether the work is on schedule, the cost of treating an area equivalent to that of MWSs with high and high erodibility should be charged to the project, and its progress in terms of the actual area treated should

determine whether the work is pari-passu with construction. The remaining area should also be treated as expeditiously as possible, though not at project cost.

- The catchment area treatment plans must be totally revamped and must not only include forest areas but also non forest areas including cultivated lands which need treatment.
- 8. The catchment area treatment should be planned and implemented in partnership with the local communities and in an integrated manner, incorporating the following principles:
 - Identification and demarcation of the degraded or degrading microwatershed (MWS), using remote sensing, topo sheets and ground truthing.
 - ii) Identification of the local communities with a stake in, and/or an impact on, the MWS.
 - Formation of a community institution, like a micro watershed development team (MWDT), similar to joint forest management teams in reserve forest areas, with all adults of the identified communities as members of the general body and the team consisting elected members with adequate representation of women and SC/ST/OBC in proportion to their strength in the general body. The leader of the MWDT should be chosen by the general body

- The MWDT should be assisted by memoers of the CAT implementing agency, specifically by a forester, and representatives of other disciplines relevant to the MWS including, as appropriate, village level extension officers in animal husbandry, agriculture, imigation, soil conservation, etc.
- v) The MWDT should be responsible for jointly planning and implementing, along with the CAT implementing agency, the catchment area treatment activities in the MWS, on the basis of a participatory, integrated, site specific micro level plan (for details see Annexures III.xx & xxi)
- The activities planned and executed under the CAT plan must be focused on prevention of soil erosion, regulation of water runoff and stabilisation of slopes. In order to keep costs down and promote sustainability, primary stress should be given to land use planning, planting and regeneration of vegetative cover and minor soil and water conservation works, with only very essential engineering structures. Social and ecological sustainability of CAT must be ensured and, for the purpose, without compromising the objectives of CAT, efforts must be made to promote species which are preferred by the local people and suitable for the local conditions.
- Apart from regenerating the MWS, the pressures that led to the degradation of the MWS in the first place must also be identified. Appropriate action plans must be developed and implemented, through the MWDT, for diverting and minimising these pressures. This would involve the ecodevelopment approach where investments would have to be made in finding alternate sources of, or alternates to, the biomass and income needs of the local communities which were being currently met from the catchment area but unsustainably (for details see Annexures III.(xx))
- viii) Suitable financial and administrative arrangements would have to be made to ensure that decentralised decision making through the MWDT is made possible and that the flow of funds is appropriate and timely.
- At the completion of the project period the responsibility for maintaining the non forest areas, including the civil soyum forest areas, would shift fully to the local community structures, with monitoring functions performed by State authorities and independent monitoring institutions. Joint forest management structures will be established, as laid down in the UP Government guidelines.
- In order to ensure the financial viability of these community institutions, MWS level trust funds should be formed with initial inputs from the project funds. Once the CAT project is completed, maintenance of the catchments must be ensured through peoples participation and made economically viable by making payments to the community for forest protection work done on behalf of the forest department.

In general, it must be ensured that the local communities develop a stake in the sustainable conservation of the catchment.

The Committee has been given to understand that such an approach has not only been adopted by the central ministries of agriculture, rural development and environment & forests, but also by the Uttar Pradesh Government in its Doon Valley Integrated Watershed Management Project, and in other projects. As such, the recommendations of the Committee are in keeping with accepted practice.

Perhaps to develop the detailed plan, the implementing agency can appoint a small Committee with some representation from NGOs with experience in such work.

- 9. The catchments already treated need to be retreated, wherever necessary, by following the guidelines specified for the new catchment areas. In those cases where the THDC (or other implementing agency) feels that the areas already treated are up to the mark, both ecologically and socially, a site by site assessment should be made by the monitoring Committee which is being recommended to monitor the environmental and rehabilitation aspects of the project.
- 10. The treatment of catchment must be regularly monitored by the aforementioned monitoring Committee. The reports of this Committee should form an important basis for determining whether catchment area treatment is proceeding pari passu, both in terms of quality and extent.
- 11. The Committee also recommends that a green belt be planted along the nm of the reservoir, with the involvement of the local people, to prevent soil erosion and the flow of silt into the reservoir.
- 12. An environment cess may be levied, on the power sold, for meeting the increased expenses on measures for environmental protection and regeneration. The estimated amount should be advanced by the Ministry of Power and subsequently recovered from the said cess.

Fauna and Flora

The Committee recommends that:

- A comprehensive, multi disciplinary Study (covering botany, zoology, water-quality, micro-climate, and their inter-relationships) be undertaken to identify in detail the impact of the project on the fauna, flora and biodiversity of the region. The Study should take into consideration the various concerns mentioned above. It should focus on the impact on populations and on local viability of species, and not just on rare or endangered species.
- ii) The Study should be so designed as to cover at least two complete annual cycles and should be carried out in accordance with well established scientific methodology for such studies.

If these studies throw-up a need to minimise the impacts of the project on any population, species, or ecosystem, there must be a verification by the MOEF that the steps required to minimise such impacts have been initiated. The MOEF should within a reasonable period get an assessment done and ensure that those activities of the project which might adversely affect fauna or flora be appropriately restricted, modified, slowed down or even suspended if necessary, till the above mentioned Study is completed and the steps required to minimize such impact have been initiated.

Health Impacts

The Committee recommends that a comprehensive Study of the potential health impacts of the Tehri dam, not only through its reservoir but through all other aspects including the reservoir of the downstream dam, and the impaction canals, be urgently carried out. This Study should identify all the possible negative health impacts and develop appropriate preventive action plans. Where total prevention is not possible, appropriate and adequate curative plans should be developed. The Study and the action plans should be got approved from the Ministry of Health, GOI. The proposed monitoring Committee should ensure that the plan is speedily prepared and should monitor its implementation. Needless to say, the plans should be drawn up and action initiated well before the impoundment of water starts.

Dust Pollution

- The Central Pollution Control Board (CPCB) should immediately set up a series of air pollution monitoring stations in the town and around the project and excavation sites. The cost of installing and maintaining these stations should be met by the Tehri Project Authorities. The CPCB should clearly indicate the standards and limits which the dust levels should not exceed. If appropriate standards are not available, the CPCB should urgently formulate them.
- The THDC should urgently have an action plan prepared for controlling the dust levels so as to ensure conformity to the aforesaid standards at the earliest. The plan should be completed and implementation initiated within three months, to the satisfaction of the MOEF.
- 3. The weekly dust level readings from the monitoring stations located at centres of habitation should be published in local newspapers along with the prescribed standards for the areas. These should also be periodically reviewed by the monitoring mechanism being recommended for the environment and further remedial action taken from time to time, if required.

Water Quality

The Committee is not in a position to express authoritative views on the various issues involved. However, they are clearly of great importance and need to be resolved urgently. The Committee would recommend that the MOEF should give careful consideration to the views of the various institutions, arrive at definitive conclusions and formulate appropriate action plans.

The Committee also feels that the possible impact of the construction of the reservoir on the quality of water downstream also needs to be studied.

Further, the possibility of mineral contamination of the water in the reservoir, due to hydraulic continuity, caused by the weight of the impounded water also needs to be examined

The water quality data should also be communicated to the Zoological Survey of India, the Botanic Survey of India and to other institutions engaged in assessing the environmental impact of the Tehri project, as the water quality profile needs to be taken into consideration by these agencies while finalising their own recommendations.

The Committee also feels that various proposed activities like the construction of a ring road along the reservoir, the construction of shops along the reservoir rim, and cultivation on the draw down area of the reservoir, could have a bearing on water quality. The Committee recommends that remedial measures should be planned for and implemented.

Compensatory Afforestation

As the MOEF had approved the location for compensatory afforestation and as the work has already been completed, the Committee cannot fault the Project Authorities. However, the Committee feels constrained to observe that what has been done in this case can hardly be described as 'compensatory' afforestation. Perhaps something can still be done to remedy this deficiency. Without taking a view on whether non forest land is available or not within the region, compensatory afforestation in the real sense can perhaps still be done on equivalent degraded forest land within the same ecological region. This would be in addition to what has already been done elsewhere. The Committee recommends that this should be urgently re-examined by the MOEF. The cost of this further afforestation should not be charged to the project as the Project Authorities have already complied with the MOEF stipulations for compensatory afforestation.

Command Area Plan

The Committee recommends that the stipulations of the MOEF in its letter of clearance relating to the submission of the command area plan be strictly adhered to. The plan must specifically include measures to prevent the familiar phenomena of water-logging and salinity.

Disaster Management Plan

The Committee recommends that, the MOEF, Ministry of Power, and the Ministry of Agriculture should get together and immediately finalise the DMP to the satisfaction of MOEF. Pending such finalisation of the DMP, the conditions of clearance regarding the submission of the DMP, stipulated by the MOEF in its letter giving environmental clearance, should be strictly adhered to. Action plans emanating from the disaster management plan must be finalised so as to be completed prior to impoundment.

Downstream Impacts

It is necessary to Study what would happen to the aquatic fauna and flora downstream, especially to the fisheries; the availability of water and the recharging of aquifers due to seasonal reduced flow in the river; and levels of pollution downstream during the periods when water flows from the dam would be absent or below the normal levels. As the flow of silt and other nutrients play an important part in downstream ecology, the impact of the reduced flow of silt downstream of the dam would also need to be assessed.

Reservoir Rim Stability

The Committee recommends that all these opinions and recommendations should be carefully examined by the MOEF and appropriate remedial measures prescribed.

Water Availability/Discharge and Sediment Load Data

The Committee recommends that these two important aspects of water availability and silt load estimation should be carefully examined by the MOEF and appropriate action plans laid down

VI.3 EMPLOYMENT AND INCOME GENERATING SCHEMES

The Committee is of the view that the existing Policy of giving preference in employment to the project affected persons, particularly in the category of workmen and supervisors, may be continued. However, it has been felt that there are limits to giving preference in employment to the people from the other Districts of Garhwal Region, as the idea behind preference is to compensate the people who have got displaced or have been affected by the project.

A point was raised during discussions that in case the present Policy of filling of the backlog of SC/ST reserved vacancies is not insisted upon, the THDC can further employ additional man-power from the Tehri District. However, it was noted that, being the national Policy, the reservation for SC/ST is being enforced as per the Govt. guidelines.

During the visit of the Committee the people wanted that employment be given to one member from each affected family as per the orders of U.P. Govt. The Committee went through various orders of U.P. Govt. for providing employment. It is noted by the Committee members from the various U.P. Govt Orders that these orders , inter-alia, provide the guidelines for employment in various industrial units owned by it in terms of which the local people of the area where the project is being constructed are to be given employment preferentially. The Tehn Project was transferred from Govt. of U.P. to THDC as a Govt. of India and Govt. of U.P. Corporation in 1989. The Govt. of U.P. orders do not impose categorically any obligation on the part of THDC to give employment to at least one member each of the dispossessed family. A GOI's order dated 03.02.1986 stipulates that any understanding, formal or informal in regard to offer of appointment, to one member of every

dispossessed family in the Project will stand withdrawn. However, with a view to encouraging the dispossessed families taking to useful avocations like poultry faming, animal husbandry, the Project Authorities will assist the concerned State Government in organising and financing such activities. The basic responsibility of initiating such schemes will be that of the State Government.

(1) Employment By Contractors

i) Major Contractors

After deliberations, the Committee felt that the major contractors working in the project should be asked to employ a certain percentage of local persons in the category of unskilled workers, clencal staff and supervisors from the Tehri District, if available. The percentage to be recruited on the project from the Tehri District, including the persons shifted from submergence area should be 40%, i.e. equivalent to that engaged by THDC. The Committee recommends accordingly. The persons employed by contractors may be

kept on probation for three months and depending on their performance being satisfactory during these three months, they could be continued further on the job.

ii) Small/Petty Contracts

The Committee is of the opinion that, in order to provide gainful employment to the local population, the THDC may award small value contracts, say upto Rs.50,000/- to the local people, for which a roster could be maintained by the project and work awarded serially, subject to the completion of the earlier work satisfactorily. These local contractors should be undeer obligation to employ the workmen exclusively from the submergence area for which the desired record may be maintained by them. Violation of this condition should entail black-listing of that contractor for award of all future contracts by the THDC.

(2) Employment by other Govt. Agencies

The Committee felt that for the treatment and soil conservation work in the Catchment Area, the Forest Deptt., Rural Development Deptts. etc. will need to employ more persons. The Committee recommends that the State Govt. may give preference in future employment for such and other works to the local affected persons of the Tehri District, including those who have got resettled in the resettlement colonies.

(3) Indirect Employment Opportunities

With the construction of the New Tehri Town at a high altitude, formation of reservoir, better road network etc., it is expected that there will be an allround development in the area, which will enhance the employment opportunities due to setting up of new non-polluting industries, better tourism opportunities, and other commercial activities. All these will contribute to increase in employment opportunities through developmental activities, which will in turn help in generating indirect employment in commercial ventures, like boating, transport vehicle repair shops, business, hotel industries and several other indirect activities.

The Committee would classify self-employment/income generating schemes into following two catagories :

i) For the people who will continue to remain above the reservoir rim

In the category, people can be benefitted :

- (a) from the Watershed Management Schemes by involving local people, which will create employment opportunities;
- (b) from other schemes like, horticulture, fisheries, poultry farming, sericulture, bee farming, dairy farming etc. through self employment (A sample list of such schemes is given at Annexure IV.2).

The responsibility for Watershed Management will be of the Forest Deptt.. For other schemes the services of NGOs could also be provided by THDC to work as facilitator and for guiding/training the people, providing assistance for getting loans from banks/other Govt agencies, and helping in marketing etc. for a penod of 5 years.

ii) For the people who shift to re-settlement colonies

In order to improve the quality of life, these people should be provided help in taking up works in various schemes introduced by the Govt. of U.P., like, poultry farming, horticulture, floricultur, agriculture cash crops by introducing improved varieties of cereals, oil seeds, vegetables fruits, roses and for helping in better performance through the use of drip irrigation adopting proper crop pattern, use of mechanisation etc.

Committee also recommends that propagation of cold water pisci-culture in Garhwal Mandal should also be thought of and a plan should be worked out for the training of villagers in pisci-culture.

Committee also feels that it is advisable to arrange for the navigational training of the young people from the villages around the Dam. This will help the local people to take up the navigational activities to earn their livelihood after the construction of the Dam, which will also put a brake on the fleeing of persons from Garhwal Mandal.

Committee recommends that in Pathri 3-4 revenue villages may be made so that Project Affected Families may lead their lives socially and economically as they were having in Garhwal. Sufficient water may be provided in Pathri, Raiwala and Bhaniawala for dairy farming, floriculture, apiculture and sericulture and other paying business from the cultivation of herbs etc..

Other income generating scheme for women, like handicraft work, khadi work, cottage industries, envelope making, tailorting etc. could also be started.

The interested PAPs may also be helped by the NGOs, who could be engaged by THDC for guiding the people as facilitators and to help them in getting training/taking loans from banks/other Govt. agencies, marketing etc. for a period of say 5 years. A sample list of activities which can be taken up in re-settlement colonies is given at Annexure IV.2.

NGOs will act as catalysts in propagating value added agricultural activities in the area by involving the people. They will also help in opening of growth centres with the help of State Govt. The NGOs will motivate the people by holding village level meetings so that some people come forward as rural entrepreneurs who may engage other villagers as their employees, while some others can be trained to take up marketing activity for these entrepreneurs. For this purpose, if possible, pilot projects can be arranged by the NGOs under various State Govt. schemes. In addition, the NGOs can help in training some young and energatic people as tourist guides, in mountaineering, hiking etc. NGOs will also prepare a data base on people, unskilled, skilled with type of skill etc.

These are essentially preliminary recommendations. The THDC should commission an appropriately qualified NGO or Institution to develop a detailed plan for employment generation, in collaboration with the PAPs. Such a plan must be based on a proper assessment of market potential, the skills and inclinations of PAPs, the social and economic sustainability of each activity, and the availability of finances, technology and training opportunities. The roles of various agencies in developing such employment opportunities should be clearly spelled out and agreed to by them in writing. Resources required for implementing the plan must also be earmarked and its availability assured. The implementation of the employment generation activities must also involve beneficianes.

VI.4 INSTITUTIONAL MECHANISM

1. The Co-ordination Committee chaired by the Commissioner Garhwal Division has Chairman of both the Nagar Palika and Zila Panshad Tehn as members. Suitably strengthened as under, it would perform the functions, laid down in para VI.4.2.

	Commissioner, Garhwal Division		Chairman
	C.M.D., THDC		Co-Chairman
*	District Magistrate, Tehri Garhwal		Member
	District Magistrate, Dehrodun		"
*	District Magistrate, Haridwar		44
*	Conservator of Forest concerned with	CAT	**
	Chairman, Zila Parishad, Tehri		46
*	Chairman, Nagar Palika, Tehri Town		18
*	M.L.A. Project Area		14
*	Block Pramukhs (Bhagirathi &		
	Bhilangana Valleys & Pratap Nagar Blo	ock)	**
•	2 Women Gram Mukhias, 1 each from		
	submergence and resettlement area Representatives of 2 NGOs/		4
	Institutions to be coopted by the Chair		
٠	Representatives of State Govt. in the	4	
	Departments of Revenue, Irrigation, PV		
	Urban Development and Institutional	VD,	
	Finance		
*	Director, Rehabilitation		Member Secy.

- 2 The Co-ordination Committee will perform the following functions:
- Co-ordinate with the various concerned deptts, of the State Govt, for works which relate to the Project.
- Help the Project Authorities in land acquisition.
- Help the Project Authorities in shifting the Tehn Town so that law & order does not get disrupted.
- d. Get necessary reports from THDC from time to time and follow them up.
- e. Consider general grievances of the public related to their rehabilitation/re-settlement
- 3. The Director of Rehabilitation who will be a Senior Officer in the IAS will be responsible for the entire rehalibitation and resettlement work and will exercise complete control over all the officers and staff of the various departments involved in the implementation. Director's team would be manned by Officers of the U.P. Govt. If necessary, on deputation to THDC so that these dedicated lot of officers could work with a sharper focus.
- The Director of Rehabilitation would work as a full time officer on deputation to THDC. He could work out the size of his team after assessing the speed with which Rehabilitation and consultation works are to proceed. In order to ensure that rehabilitation matters receive the importance that they deserve, it would be desirable to nominate Director of Rehabilitation to the THDC Board, which would then benefit from the first hand account of both the progress and problems of rehabilitation.

There should be one Monitoring Committee for rehabilitation and environment to be ired by Secretary, Environment & Forests, GoI, constituted by and large on the ern of Narmada Control Authority sub-group.

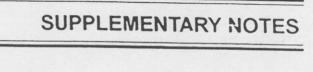
The monitoring Committee shall perform the following functions:

- Monitor the implementation of the conditions of clearance, as stipulated by the MOEF, and to advise MOEF on their compliance.
- ii) Monitor whether the environmental and rehabilitation work of the Project is proceeding pari-passu and recommend remedial activities, where required.
- Take an overview of the environmental and rehabilitation aspect of the Project and recommend additional studies and where required take action to enhance these aspect of aspect of the Project.
- 6. The Co-ordination Committee should set up a Grievances Redressal Cell, independent of THDC, which should include women members and NGO representatives so that the cell acquires a stronger focus while dealing with the resetttlement of PAFs with specialemphasis on the rehabilitation of women and upgradation of their skills.
- 7. A large number of representations have been received by the Committee considering the strong sentiments of these Project Affected Persons, the Committee recommends that these representations may be handed over to the proposed Grievances Redressal Cell for careful consideration.
- 8. In order to ensure transparency, the Coordinating Committee should from time to time, but at least once in 6 months, organise in different places, preferably through NGOs or other independent institutions contracted for the purpose, public hearings where details of past and proposed rehabilitation activities would be made public. This would include list of PAPs, valuation of their assests, details of the compensation package provided, the details of the various steps taken etc.

Other issues to be included in such public hearings would be identified, from time to time, by the Monitoring Committee and by the Coordination Committee.

We, the members of the Review Committee on the Environmental and Rehabilitation Aspects of the Tehri Hydro-Electric Project, hereby adopt this Report

New Delhi: Dated 26 October	(,(1)7
New Delhi Dated 25 October	n) and
(Ms. Anna Malhotra)	(N.D. Jayal)
Member	Member
Knitshink	
(Dr. Kirit Parikh)	(Principal Secretary (Revenue))
Member	Govt. of U.P.
N	Member
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	(Principal Chief Conservator of Forests)
(V.K. Sinha)	26 10 97 / of C' (MIL DIAL)
Member	(Principal Chief Conservator of Forests)
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(Prof. Ramaswamy R. Iyer)	My Explanding Noll 6 appended.
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(Prof. S. Parasuraman)	
Member	
///	CHIEF.CO.
//////////////////////////////////////	(Prof. C.H. Hanumuntha Rao)
(Prof. Shekhur Singh)/_	Chairperson
Member	



EXPLANATORY NOTE OF SHRI M.L.GUPTA, CMD, THDC

A. ENVIRONMENT

TERMS OF REFERENCE OF THE COMMITTEE

The Expert Committee on Environmental and Rehabilitation aspects was constituted by the Govt. of India, Ministry of Power, vide O.M. No.19/18/96-Hydel-II dated 17th September, 1996. The terms of reference of the Committee in respect of environmental issues were "to examine the implementation of various conditions of environmental clearance..... and suggest additional or improved environmental safeguards, if any, based on data and information now available". It is clear from the terms of reference that what was desired from the Committee was basically to assess whether any additional measures or improved environmental safeguards were required to be implemented, based on the data and information now available, after examining the currently on-going implementation of environmental conditions. Thus, a positive approach had been envisaged by the Government from the Committee with a view to protect and improve the environment and ecology of the area. Also, the TOR did not enjoin a de-novo examination of environment clearance accorded to the Project.

There is, however, excessive concern in the Report on issues, like adherence to the dates set by MOEF in the clearance letter, approval by MOEF of reports/studies submitted to them, etc. These matters basically fall under the Government's purview and they were fully aware of the status of these studies even before the Committee was constituted. The basic objective was to suggest improved and additional measures and the Report should have restricted itself to TOR.

In this connection, I would also invite a reference to the replies received by the Committee from the Ministry of Power, in response to letters sent to them, in which the position concerning scope of work of the Committee had been clarified. In the D.O. letter dated November 27, 1996, Secretary, Ministry of Power, had clarified to the Chairman of the Committee that the terms of reference of the Committee are basically aimed at examination of the rehabilitation policy as well as the conditions attached to the environmental clearance and to ensure that these are being implemented properly and to suggest remedial measures wherever necessary. It was stated by Secretary(Power) in that letter that the Committee need not examine the reasons leading to the

environmental clearance. This was again confirmed by the Ministry of Power in their subsequent letter dated 11.12.1996, and it was advised that some of the issues raised (by Shri Shekhar Singh in his letter of 22.11.1996) clearly did not come within the purview of the Committee. These letters clearly support my view.

While, no doubt, adherence to the time schedule of implementation would have been important keeping in view the time schedule then envisaged for the project, especially in the context of present project status the Committee should have appreciated that THDC has completed all the required studies and is committed to implement the environmental measures pari-passu with the project execution. Moreover, non-fulfilment of target dates set in the environment clearance letter of MOEF in no way conveys that environmental conditions have not been fulfilled. Therefore, the aspect of adherence to the time schedule does not deserve the importance given to it in the Committee's report.

Further, while it was no doubt necessary for the Committee to examine implementation of various studies and their recommendations, or non-implementation of any of the conditions of clearance, this had to be done in the context of improving/or expediting the implementation process, and introducing additional measures, if necessary.

Further, it was also not necessary to sit on judgement on the correctness or quality of studies undertaken by the highly specialised agencies and thereby try to down-grade their utility or usefulness. The case in point would be the Studies on Water Quality, the Rim Stability, Flora by the Botanical Survey of India, and Fauna by the Zoological Survey of India. Instead of devoting much of the time on picking holes and criticising various aspects of the Studies, it would have been more appropriate to have examined these reports in the spirit of assessing what more is needed to be done and suggest additional measures, if any, to be taken in these areas.

It is also clear that the Committee was not expected to question or go into the aspects connected with environmental and economic viability of the Project. However, time and again this aspect was sought to be raised by some members of the Committee though, as conceded by the Committee themselves, these issues were outside their purview. This aspect has unfortunately found mention in the Report inspite of its being fully

aware that the Committee was neither equipped nor expected to examine the aspect of environmental and economic viability of the Project, especially when the Project had already been approved by the Government after full consideration of all relevant aspects and considerable execution is currently well under way and considerable expenditure has been incurred on project execution. The concern about the enforcement aspects, and on which the Committee need not have concerned itself, has coloured the Report, with lopsided and unwanted attention to issues which focus on negative improvement.

IMPLEMENTATION OF CONDITIONS OF ENVIRONMENT CLEARANCE

Environment clearance to the Project had been accorded by the Ministry of Environment and Forests, vide their letter dated 19th July, 1990 in which it was, interalia, required that "completion of studies, formulation of action plans and their implementation will be scheduled in such a way that their execution is paripassu with the engineering works.....". In THDC's view, what was crucial was the execution of environmental action plans, wherever called for, paripassu with construction of the Project. It is not the exact dates for completion of studies/formulation of action plans that were critical, but their implementation that had been emphasised.

TIME SCHEDULES

While it is correct that the time schedules which were laid down, were not kept up in the matter of completion of various studies, the basic fact remains that the required Studies were completed and reports submitted to the Govt. Well before the investment approval was accorded to the Project in March, 1994. Thus, while considering approval to the Project, the status of compliance with the conditions of environment clearance, including the outcome of studies required to be undertaken, had been duly taken note of by the Govt. The implementation of the Project, in its present form, as a joint project of the Govt. of India and the Govt. of UP, had thus commenced in the real sense only after March, 1994 and, therefore, the condition of pari-passu execution of action plans could become effective only thereafter.

I also like to point out that earlier also, studies on environmental aspects had been conducted before the

environment clearance was accorded by MOEF in July, 1990. Thus, it would be unfair to assume, and project in the report, that the clearances had been accorded in a vacuum. In this connection, I would like specifically to invite attention to the Press Note issued on 06.01.1987 by MOEF, in which it had been stated as under:

"The Government have cleared the project after a thorough assessment of the impact of the project on environment and after satisfying themselves that the adverse impacts on environment can be remedied through several measures as outlined above. The Government will ensure that these remedial measures are taken up alongwith the project and completed in time"

I also wish to state that extensions of time schedules had been duly sought from the Ministry of Environment and Forests and the status of implementation of environment conditions were also intimated to the Government by THDC from time to time.

Therefore, in my view, the matter concerning submission of study reports within specified dates needed to be viewed in the overall context of the project implementation and that emphasis on aspects concerning non-adherance to the time schedules is unnecessary. The basic fact remains that the required studies had been duly completed and their results were apprised to the MOEF by submission of reports to them.

APPROVAL OF STUDIES

Regarding obtaining specific approvals from MOEF on the Studies/Action Plans, it is the contention of the THDC that once various study reports etc. were submitted to the appropriate authorities, in the absence of any comments to the contrary from them, it had to be assumed that their conclusions and the formulated Plans were acceptable to the Govt.

In a few cases, like Water Quality Study and the Rim Stability Study, no specific measures were required to be undertaken and consequently no action plans were to be formulated. The Catchment Area Treatment Plan had been formulated, after the analysed data became available from the Remote Sensing Applications Centre (RSAC), UP, after a series of discussions held with the MOEF, the State Forest Deptt, the RSAC, and the Corporation. The CAT Plan thus formulated, based on

approved Govt. guidelines, had been forwarded to the Govt./MOEF and has been under implementation since then. The MOEF had subsequently wanted to have area maps with markings of catchment treatment undertaken in the past and now proposed to be undertaken under the new Plan; these were also complied with and maps furnished to MOEF. Therefore, assumption of its approval on the part of project authorities was but natural. In any case, absence of specific approval to CAT 1994 Plan has to be viewed in the context that the CAT programme has been continuously under implementation and, by now, more than 29,350 ha of high and very high erosion category areas have already been treated at the Project cost. In case of Floral and Faunal Studies by BSI and ZSI, respectively, position concerning formulation of Action Plans had been intimated to MOEF and Action Plan for Mahaseer formulated and forwarded to the Government.

IMPLEMENTATION

I would like to note down the status of implementation in each case with which THDC was concerned:

a. WATER QUALITY

No Measures necessary in view of findings of the Study conducted by the University of Roorkee.

b. STABILITY OF VILLAGES ALONG THE RIM OF RESERVOIR

No measures necessary in view of findings of the Study conducted by the UOR.

C. CATCHMENT AREA TREATMENT

Under implementation right since 1983-84, as per the guidelines applicable from time to time. CAT 1994, formulated after detailed discussions in MOEF, based on data provided by RSAC, as required in the clearance letter of MOEF, is also under implementation. This has been duly acknowledged by MOEF in their letters dated 03.02.1997 and 24.04.1997 to the Committee in which they have confirmed that, besides an area of 22,746 ha earlier treated, an additional area of 13,500 ha in the direct draining catchment is being treated by project authorities. So far, an area of over 29,350 ha. has already been treated in the Tehri Catchment at a cost of Rs.32 crores, through the State Forest Department - also as required in the environmental conditions. It is planned to complete the remaining areas, as i programmed, before impoundment of reservoir.

The Committee in its report has now recommended a substantial enlargement of catchment area to be treated at Project cost, including its methodology and scope. These recommendations touch upon the basic policy norms decided by the Govt. and, therefore, the matter would need careful consideration by the Govt. in all its aspects, including their implications for this and other future projects.

d. FAUNA

In case of faunal study by ZSI, the following further measures were required to be taken as per their recommendations:

- Formulation of action plan for propagation of Mahaseer fish, etc.
- ii. Plantation of species of trees/plants recommended in the report, and
- iii. Undertaking monitoring and further appraisal of the faunal components, both during impoundment as well as afterwards, to formulate long term planning of the faunal conservation and management.

An action plan for conservation of Mahaseer fish was duly formulated through the Consultants and was submitted to the MOEF; the Plan is now to be implemented pari-passu with construction works. Regarding plantation of species, the State Forest Deptt., who are implementing the Catchment Area Treatment Plan in the area, were duly apprised of these recommendations and they confirmed that action was being taken/would be taken according-Regarding further studies, the THDC had specifically informed the Committee of its decision to commence further faunal studies two years before impoundment so that these could continue for one year in the post-impoundment period as per the requirements indicated by ZSI; this would help in taking such additional measures for faunal conservation and mangement, as may become necessary consequent to further studies extending over a period of three years, covering both pre and post impoundment periods. Thus, THDC had,

and is taking implementation actions as per recommendations made by ZSI. Therefore, position depicted in the report (Pages 30 & 49) on this aspect does not conform to facts. It is most unfortunate that the measures initiated by THDC have not been given due weightage in the Report.

The Report highlights the aspect of short duration of six months given for Faunal and Floral Studies. The utility of these Studies has been seriously questioned on this ground. I would, however, like to point out that:

- i. the environmental conditions of MOEF had in itself envisaged a Study of about 6-8 months, essential for the purpose of project approval;
- ii. this is not the first time that the Faunal and Floral species of the area had been studied; previous studies undertaken were duly taken into account by ZSI and BSI.
- iii. the conclusions and details given in ZSI and BSI reports are based on scientific studies and are highly useful for initiation of appropriate measures, and
- iv. this is not going to be the end of Studies. Further detailed studies, are to be initiated by THDC, covering a period of 3 years of pre and post impoundment periods.

e. FLORAL STUDY

Similarly, regarding floral study done by the BSI, necessary action for plantation of the recommended species has been initiated through the State Forest Deptt. who confirmed to the THDC that these are being/would be planted as per recommendations.

The Study, as earlier stated, has to be viewed in the perspective that this forms part of a series of studies that had been conducted in the area in the past. The present study as detailed under the conditions of clearance is only site specific and had naturally to be limited in its scope. Their report has covered both rare and non-rare species found in the area of study, taking due notice of the findings of the earlier detailed study.

In my view, the ZSI and BSI are highly specialised national level expert organisations of MOEF and are of international repute. They are fully equipped to conduct the studies and the recommendations made by them carry weight; their conclusions should not be brushed aside lightly. As against this, without plausible reason and adequate justification the Report tends to deprecate and doubt the conclusions of ZSI/BSI that no adverse effect of the proposed reservoir is contemplated.

DISASTER MANAGEMENT PLAN (DMP)

As intimated by THDC to the Committee, the DMP, as per requirements of the conditions of clearance, had been prepared and submitted to the Government, through the Ministry of Power, who forwarded it to the Nodal Ministry for this subject, the Ministry of Agriculture, for consideration. Clarifications on the comments received from the Ministry of Environment & Forests and the UP Irrigation Department, on the DMP submitted by THDC, were also furnished. Further steps in the matter could only be taken depending on the advice of the Government. Therefore, THDC had met with this condition as well.

It had also been explained to the Committee that the DMP and Action Plans formulated thereunder would become operational only after impoundment of reservoir, since these actions would relate to downstream population affected by discharge from the dam in emergencies. Till the Dam is completed and impoundment takes place, the need for activation of DMP would not be there. Impoundment is yet quite a few years away. However, Government may be requested to expedite consideration of the submitted document.

SOCIO-ECONOMIC STUDY

As per the requirements of environmental conditions of MOEF, a Socio-economic Study concerning the living standards of oustee families was conducted through the Administrative Staff College of India, Hyderabad, and their report, received on 31.3.1993, had been forwarded to the MOEF through Ministry of Power. Thus, this condition of environment clearance was also duly complied with.

In my view, therefore, whatever actions were required to be taken as per conditions of environment clearance, were duly taken by THDC, though not within the dates

given by MOEF because of various compelling circumstances. Non-adherance to the time limits should not, however, sideline the fact of having completed various Studies and initiated actions, where required.

I would like to emphasise that the THDC is fully committed and willing to take all further additional measures recommended and decided by the Government and no effort would be spared by the Project authorities in improving the environment and ecology of the region.

The conditions concerning submission of Command Area Development Plan and setting up of the Bhagirathi Basin Management Authority on a statutory basis through legislative action, were to be complied with by the State Government, regarding which the Govt. is aware of the position. As per understanding available to the THDC and as indicated by Govt. of UP to the MOEF, plans connected with the utilisation of water releases from Tehri Dam for irrigation in the Command areas are being implemented and considerable work has already been completed. Further, an overall approach is also being considered by the UPID in consultation with the Central Water Commission.

RECOMMENDATIONS CONCERNING ENVIRONMENTAL CLEARANCE

In the Recommendations in regard to observance environmental conditions (page 32 of the report), views of some members of the Committee (who were in minority) have been recorded, as per which the Project was neither assessed from the environmental angle, nor properly costed in terms of environmental and rehabilitation requirements before clearance, albiet conditional, accorded. I would like to record that this view is incorrect and is not justified. Before project was accorded clearance/approval, all connected environmental and rehabilitation aspects had been carefully gone into by the Government and their costs had duly been taken into account. Further, these some members minority) have also expressed the view that the environmental and economic viability of the project should be reassessed and that the work of the project must be suspended till such time an assessment is completed. This approach has very serious implications, involving heavy escalations in costs. The other members of Committee (who were in majority) disagreed with view of minority members. This view of some members also was in relation to an aspect which was beyond the terms of reference of the Committee. These studies were basically designed to assist in taking remedial measures to mitigate the adverse impacts on environment, if any. This is clear from the reading of the conditionalities of environment clearance issued in July, 1990.

The Committee, in its conclusion, as a part of "Recommendations". has observed, in general, about the practice of according environmental clearance to projects before all necessary studies have been completed the environmental viability of the project established; also, that the economic implications must be fully assessed and taken into consideration while according economic clearance. I had clarified to the Committee, this connection, that the project was examined carefully by the Government, including environmental issues, and the project was accorded environmental clearance, after the perusal of the records of various scientific bodies of experts and only after the Government was fully satisfied. Further, project was approved by the Govt., from investment angle only in March, 1994 after various studies required as per environmental conditions had been completed and their results were known to the Government. The various environmental and rehabilitation costs had been duly included in the cost estimates of Tehri project.

However, it is clear from the Committee's recommendation (page-32) that this is a general observation/recommendation about projects in future, and not connected with the Tehri Project.

There is also a recommendation that the environment clearance should be given only for a specified period, say two years, at a time and the project authorities must subsequently have the clearance renewed based on their record of compliance with environmental safeguards. This proposition, in my view, is not feasible to adopt in case of major infrastructural projects, like Power Projects. Once environmental and project approval has been accorded, works are commenced and major contracts are entered into, both for civil works and E&M equipments. It is not feasible to implement major power projects in an atmosphere of uncertainity. The proper thing may be to review implementation of environmental safeguards periodically and make midcourse corrections, wherever called for. The Government may, therefore, give a careful consideration to the implications of this recommendation in regard to execution of various projects.

ADDITIONAL ISSUES

DUST POLLUTION

It had been explained to the Committee that in major civil work of Dam construction, involving stripping operations, transportation and placement of huge quantities of earth and rock fill materials, raising of dust is inevitable. While efforts are made to minimise the raising of by regular sprinkling of water on approach roads, would be impracticable to propose that the volume of dust must always be contained within specified parameters/standards. When it indicated that such standards do not exist irrigation/hydel projects, the Committee wanted these to be formulated by CPCB, who should also set up monitoring stations, with dust level readings being published on a weekly basis.

In my view, this whole approach in the matter is impracticable and would seriously hinder the execution of this major project within the envisaged time schedule. Instead of the suggested measures, it would be more appropriate to hasten the process of shifting the population from areas adjoining the dam construction site, particularly the population of Old Tehri Town, who was to be rehabilitated within Phase-I of rehabilitation programme connected with the Coffer Dam. compensations have already been paid to them and allotments also given by and large to most of them. As far as workers are concerned, adequate steps would be taken to limit the dust levels to minimum possible extent through use of water sprinklers and provision of masks to those who are within susceptible areas.

As it is, it may not be feasible to implement the recommendations in their present form as these do not take into account realities of the situation and, when implemented, may impede the construction programme of this Project. I may also add that dust pollution is a major issue in India, what with greenery being eroded because of population pressures. This issue needs to be tackled at the national level, instead of projecting Tehri as a test case for worst case scenario for each environmental issue.

WATER QUALITY

The Study had been completed long back by the University of Roorkee and their findings had also been apparently accepted by the Government (including MOEF). was hardly any justification to doubt the find-There ings of the Roorkee University by refering their Report to the Wadia Institute of Himalayan Geology and the NEERI, who hurriedly examined (without holding any discussions whatsoever either with the UOR or the THDC) and sent comments highlighting the loopholes, lapses possible inadequates in the Studies. Instead of criticising the UOR Study, the Committee could have, suo-moto, recommended any additional Study which they wanted to be conducted. As it is, they have simply created issues on which, in their own word, "the Committee is not in a position to express authoritative views on the various issues involved."

RESERVOIR RIM STABILITY

The position is similar in regard to the Study conducted by the Earthquake Engineering Department of the University of Roorkee to evaluate the stability of the hill slopes along the reservoir rim, with reference to villages located within 500 meters of FRL, as per requirements of the conditions of environment clearance. The Study had conclusively established that the villages around the rim would be stable even after the impoundment of reservoir. The Report had been forwarded to MOEF in November, 1992, and its findings were obviously accepted.

Therefore, there should have been no cause to doubt the accuracy of these findings. However, it is unfortunate that an assessment of Wadia Institute of Himalayan Geology on the findings of UOR Study was sought, which leads one to believe that either the UOR was not competent enough or the veracity of its conclusions were doubted. The Committee also invited three experts, two of whom had been involved in the Study of reservoir slopes, whose opinions have supported the findings of UOR. It is not surprising that it could not be feasible for the Committee to reach any conclusion and have merely recommended MOEF to carefully examine and take appropriate remedial measures.

While, the Committee was well within its terms to have recommended any additional measures, and in this direction to discuss with the experts, in my view it was

not right to have approached WIHG to examine UOR Study for so called independent assessment, especially when there was no material available with the Committee necessitating this step.

WATER AVAILABILITY & DISCHARGE SEDIMENT LOAD DATA

Unfortunately, the approach has been not to trust any assessment done or arranged to have been undertaken by the THDC, or for that matter by any Government Undertaking/Agency. Also, too much trust was placed on the WIHG to give their assessment on every issue, even on matters which they are not equipped to handle or which are outside their range of activities.

Some water discharge data was got collected from the CWC - the THDC is not aware in what form the data was given to them and entrusted it to WIHG, who have within an amazingly short time analysed and produced a report highlighting the so called inconsistencies in both the water discharge and sediment load It is all the more surprising that they did not consider it even necessary to discuss these perceived inconsistencies with the Central Water Commission, who are the concerned organisation for independently monitoring and compiling the water discharge and sediment flow data in major rivers in the country. The result a highly flawed analysis by WIHG, which only indicates that they have not been able to fully appreciate data. It is, therefore, not surprising that the Committee has found itself unable to take a view one way or the other, and has merely recommended MOEF to carefully examine the same. The entire exercise served no purpose excepting to cast doubt on the silt load assessment intimated by the THDC, which as earlier mentioned is indicative of distrust. It is my considered view that hasty analysis is no substitute for scientific conclusions.

In conclusion, I would like to reiterate that the Report should have restricted itself to the scope envisaged as per the TOR. By examining aspects unrelated to the scope of the Committee, the efforts to focus on desired issues got dissipated. In my view, it was also not right to debunk scientific studies in favour of generalised prescriptions. Most appropriately, the Report should have adopted a positive approach, and made constructive suggestions capable of being implemented.

B. REHABILITATION

1. MAJOR ISSUES EMERGING FROM ANALYSIS OF LAND ACQUISITION PROCESS

In the Chapter on Rehabilitation there is a mention about the alleged corruption in the compensations and evaluation etc. and the committee has recommended that the Government may appoint a committee to examine the incidence of corruption. As explained to the Committee, acquisition of land and properties, their evaluation and payment of compensations etc. are directly undertaken by the State authorities; THDC deposits the required funds with them. However as far as THDC is concerned, the Corporation has got a mechanism and an institutional set up to look into allegations of corruption, including a Director (Vigilance) appointed by the Government. Cases involving serious allegations, which are not many, are duly examined at length and appropriate action taken. Any specific cases could be looked into by the Govt. independently, instead of appointing a separate Committee.

 CASE FOR REDEFINING REHABILITATION PACKAGE -EXPERIENCE FROM OTHER PROJECTS

In the Chapter on Rehabilitation in Section-5, there is a mention for treating major sons and major unmarried daughters as separate family. Similarly, in the recommendations at Sl. No.II, III, IV, V & VI there are provisions for redefining the family, and revision of package for these additional family members in the rural and urban rehabilitation. On these aspects, THDC's views have already been mentioned in Section 5 on page 20 & 21 of the report, which would no doubt be considered by the Govt.

Paper.

(M.L.GUPTA)
CHAIRMAN & MANAGING DIRECTOR, THDC
MEMBER, EXPERT COMMITTEE ON
REHABILITATION & ENVIRONMENT,
TEHRI PROJECT

A Note necessitated by the Explanatory Note of the CMD, THDC

- 1 The explanatory note written by Shri M.L. Gupta, Chairman and Managing Director (CMD), Tehri Hydro Development Corporation (THDC), makes many points which were already discussed by the committee. After due consideration the committee had come to the views that are expressed in the report. However, there are some additional issues, my responses to which are given below.
- 2 The first of these issues is raised in the section titled 'TIME SCHEDULES' (page 90). The CMD has stated that all the required reports were submitted to the Government before the investment approval was accorded to the Project in March 1994. He has further stated that the Government had taken note of the status of compliance with the conditions of environmental clearance, while considering investment approval of the project.

The committee concluded in its report that some of the required reports had still not been completed. It also concluded that some of the environmental conditions of clearance had also not been complied with. Therefore, it is not possible to accept the CMD's contention that, as far back as in March 1994, the required studies had been completed and were in accordance with the conditions of clearance.

Besides, while giving investment clearance, the environmental conditionalities and their compliance thereof are not considered. It is expected that a project, which is posed for investment clearance, has been accorded environmental clearance. It is the responsibility of the Ministry of Environment and Forests (MoEF) to revoke the environmental clearance in case the conditions of clearance have not been complied with. The committee has already noted in its report that the MoEF was remiss in not fulfilling its obligations.

Also, no papers were brought before the committee to establish that the status of compliance of environmental conditions had been taken into consideration by the government while according investment clearance. However, even if this was the case, given the findings of the committee, the government was either misinformed or mistaken if it at all concluded that all the environmental conditions of clearance had been complied with. The secretary, MoEF, while speaking to the committees, on 01.04.1997, had also confirmed that environmental conditions had not been complied with. The relevant extract from the minutes, as subsequently seen and agreed to by the Secretary, MoEF, is quoted below:

"On a specific query whether in his opinion, the various environmental reports had been submitted in time and, consequently, the conditions of clearance complied with, he sated that they had not been and therefore, all the conditions of clearance had not been complied with However, he stated, as already mentioned earlier, it became difficult for the MOEF to stop construction work even though this was what was prescribed under the conditions of clearance."

Further, in its letters to the committee (dated 3 February, 1997 and 24 April, 1997) the MoEF confirmed that some of the conditions of clearance had still not been complied with.

On the next page, and in the same section, the CMD mentions and quotes a press note reportedly issued on January 6, 1987, by the MoEF, stating that the Tehri project had been cleared from the environmental angle

It is surprising that this press note was never brought before the committee during its deliberations. Also, the same Ministry saw fit, in 1989, to refer the Tehri project for environmental assessment to its environmental appraisal committee, and issued a conditional clearance in 1990, three and a half years after this reported press note. It is this 1990 environmental clearance, along with its conditionalities, whose implementation the committee was asked to assess.

However, if this press note had been placed before the committee the matter could have been sorted out by seeking the required clarifications from the MoEF.

4. The CMD has stated, in the section on 'FAUNA', that it was not correct to be critical because only six months were given for fauna and flora studies, as the MoEF "had in itself envisaged a study of about 6-8 months, essential for the purpose of project approval". However, the Zoological Survey of India, which did the fauna study, itself indicated that six months was clearly inadequate to do such a study. Nothing stopped the THDC from continuing the study, for assessing and mitigating environmental impacts, even after the first report had been presented to the MoEF. Also, In a discussion with Dr. Maudgal of the MOEF, a point was raised whether the time frame given in the letter of clearance was realistic, considering the time required to conduct the said studies and take other prescribed action. Dr. Maudgal clarified that the time schedule given in the letter of clearance was not imposed by them but was indicated by the Ministry of Power itself. Given below is the relevant extract from the minutes of the meeting:

"On a query from Shri M.L. Gupta whether the dates given in the clearance letter can be achieved, Dr. Maudgal mentioned that these are the dates which were given by the Project authorities themselves. They had then claimed that the studies were already well under way and there would be no problem in completing them by the dates they indicated."

5. There are some general criticisms of the report, which need to be put in proper perspective. For one, the CMD has in various places criticised the committee for subjecting the reports submitted by various organisations to a detailed scrutiny. According to the CMD, the committee's report should have restricted itself to only suggesting new and additional things that needed to be done rather than analysing what had already been done.

However, it is difficult to understand on what basis the additional measures that are needed could have been recommended, before clearly understanding and evaluating what had already been done.

- 6 The CMI) has also criticised the report for focussing too much on whether the conditions of clearance were complied with within the prescribed time-frame and whether the approval of the reports by the MoEF were obtained, as stipulated in the clearance letter. However, in actual fact the report has taken cognizance of all aspects of implementation of conditionalities, and not just focused on the procedural aspects. It has not only highlighted the delays but has also given reasons why such delays were significant, rather than just procedural. It has gone beyond procedural aspects and looked at the substance of the studies. reports, recommendations and their implementation. It is unfair to expect all inconvenient issues and aspects to be ignored.
- 7. The CMD has also criticised the report for questioning "highly specialised national level expert organisations" (page 94 and elsewhere). However, if all that had been said by national organisations was to be accepted without question, what was the need to set up the review committee. Also, whenever the committee expressed any reservations about any of the methodologies used, or conclusions arrived at, by these organisations, it gave detailed reasons for its views. Very often it only highlighted the constraints that these national organisations themselves recognised and mentioned in their reports.
- 8. The CMD has himself criticised various national level expert institutions, like the National Environmental Engineering Research Institute, Nagpur and the Wadia Institute of Himalayan Geology, Dehradun, (page 99 and elsewhere), because they very quickly gave their opinions without holding detailed discussions with various other agencies and doing various other things. It is important to state that both these institutions were initially hesitant to give the required responses within the short-time frame available to the committee. However, it was at the special request of the committee that they agreed to do this. They had both wanted a longer period of time and some funding and access to data, in order to do a comprehensive assessment. The committee assured them that this was not required at this stage and asked them to perform a limited task, which they both very kindly did.
- 9. The CMD refers (in section titled "RECOMMENDATIONS CONCERNING ENVIRONMENTAL CLEARANCE") to a minority view in the report. He states that it is incorrect to say that the project was neither properly assessed from the environmental angle nor properly costed in terms of environmental and rehabilitation requirements, before clearance, albeit conditional, was accorded.

However, considering the impacts of the project on fauna, flora, water quality, downstream flows, command area, disaster potential etc. had not been determined when clearance was accorded, how can it be believed that the project was properly assessed from the environmental angle.

The Secretary, MoEF, also confirms this view. Extracts from the minutes, as

agreed to by him, are given below:

"Secretary, MoEF met the Committee Members at 12.30 p.m. on 01 04 1997 and held discussions. During discussions he informed that records indicate that the decision for conditional clearance of the

project was taken not by MoEF, which did not favour clearance, but at a higher level".....

The Secretary was also asked to comment on how the MoEF could have determined that the Tehri Project was environmentally viable, and consequently given environmental clearance, when the various studies which were to assess the environmental impact of the project, had not been completed. The Secretary agreed that the MoEF could not determine the environmental viability of the project prior to the studies being completed and reiterated that environmental clearance had not been given at the behest of MoEF but at the behest of a higher level."

[Extract from the Record Note of discussion of the 9th meeting of the expert committee on Rehabilitation and Environmental Aspects held on 31st March & 1st April, 1997.

If the environmental impacts had not been assessed, then clearly the cost of mitigating the adverse environmental impacts could not have been calculated

10. The CMD has also referred, in the same section, to the views of some members that, once the required studies are complete, the environmental and economic viability of the project should be reassessed and that the work on the project must be suspended till such an assessment is completed. He has stated that such an approach has serious implication, involving heavy escalation in costs.

However, to not follow this approach has implications, which are much more serious. As seen above, the environmental and, consequently, the economic viability of the project is yet to be established. Therefore, it cannot be any one's contention that one should push ahead with the project even if it has not been established to be viable.

(Shekhar Singh

Review Committee

MINORITY VIEW ON REHABILITATION

Our signature to the Report is subject to the minority view expressed on page 22 & 23 paragraph 1 to 3 regarding provision of land to project affected people.

(N.D. Jayal)

Member, Expert Committee

" William was

(S. Parasuraman) Member, Expert Committee

A NOTE

I have no reservations on or disagreements with the Committee's observations and recommendations in its Report. I am writing this note mainly because of a certain uneasiness regarding the limited nature of the task of the Committee. The fundamental questions regarding this Project are the following:

-ls this major intervention in nature really inescapable? Are there no alternative ways of realizing the objectives of the Project partially if not wholly?

-Can it be said with confidence that <u>all</u> the human, social and environmental consequences of the Project have been foreseen, and that all of them can be either compensated for or mitigated?

-How realistic are the projected benefits, and will they be such as to justify the imposition of hardships on the people in the catchment and submergence areas?

-When all the environmental, human and social costs are fully taken into account, will the Project remain viable?

-In the light of such a thoroughgoing examination will it be desirable to proceed with the Project, or even at this late stage would it be better to stop work on the project and explore alternatives?

Unfortunately, the very limited Terms of Reference of the Committee (to which it adhered scrupulously) precluded it from undertaking such an examination. The Report takes the Project as given, and tries merely to make recommendations on environmental and rehabilitation aspects with a view to achieving improvements, enhancement of benefits, removal of perceived injustices, anomalies and inequities, and so on. I am not suggesting that this was not worth doing. The recommendations over which we laboured hard will undoubtedly be beneficial. However, it does not follow that if all our recommendations are fully accepted and implemented the Project will turn out to be a benign one. The basic questions raised above will still need to be asked and answered. I am not implying that the answers are bound to be unfavourable to the Project, but merely saying that the examination has to be undertaken,

(Ramaswamy R.lyer)