

Draft Approach Paper

Environment & Forests in the
8th Plan



Planning Commission of India
1990

Cover photograph of the peaks of Ladakh, by Vasumathi Sankaran.

Preamble

In 1990, the planning commission of India decided to set up a separate division to handle matters relating to the environment, forests, and wildlife. Till then, matters relating to the environment were being handled by the science and technology division, and matters related to forests and wildlife by the agriculture division, of the planning commission. This division of work was in conformity with the practice being historically followed by the Government of India, wherein till 1980, when a separate department of environment was created, environmental matters were handled by the department of science and technology. Similarly, till the formation of a separate ministry of environment and forests, in 1985, forest and wildlife matters were being handled by the ministry of agriculture.

In 1990, I was invited to join the planning commission as an advisor and specifically to set up and head the environment and forests (E&F) division. Apart from performing the usual function of assessing and approving financial allocations and investments in the E&F sector, both for the central and state governments, the new E&F division was also given an oversight function to be involved in the assessment of investments and projects in all sectors that could have a potential impact on the natural environment.

As the planning commission had started the process of formulating the 8th five year plan, soon after I joined I was tasked to formulate the approach that embodied the heightened focus of the commission on the environment and forest sector. This approach paper was the outcome, and was formulated in consultation with Rajni Kothari, who was the member for environment and forests.

Unfortunately, the incumbent national government, and along with it the incumbent planning commission, resigned in November, 1990, and this draft chapter, though finalised internally, never saw the light of day.

Shekhar Singh
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A. INTRODUCTION

Humanity today faces the prospect of an ecological disaster whose dimensions are still not fully comprehended. Global warming, depletion of the ozone layer, destruction of forests and other ecosystems, pollution of air, water and land, and the resultant human misery, worry and dislocation are only some of its manifestations. These, in turn, contribute to many other problems : those of growing marginalisation and the resultant social unrest, of human brutalisation, social and regional sectarianism, the breakdown of democratic social institutions, and of poverty itself. Over much of the world, the most fundamental human conflicts concern access to land, water, forests and grasslands. The degradation and depletion of the environment have aggravated these conflicts, threatened traditional stable social structures and exacerbated poverty.

As a response, many governments around the world have begun "managing" their natural resources and "planning" for the future of their environment. However, governmental responses mostly seek to manage the environment rather than control its exploitation; and to protect wasteful lifestyles, rather than protect nature. Such responses only heighten social and economic disparities, globally and within nations, and push humanity closer to the brink of ecological disaster.

In India, planned management of the environment started in 1980, with the VI Plan and the setting up of the Department of Environment. Prior to this, only the commercial use of forests was managed. However, despite such management, the last decade has been one of extensive environmental degradation in the country. It has also been a decade of unprecedented increase in consumerism, with the markets being progressively flooded with the latest in luxury goods, the number of vehicles on the roads shooting up and new luxury hotels, shopping arcades and video parlours establishing the infrastructure for an opulent and wasteful lifestyle. To make all this possible, the last ten years have also seen a new initiative in consolidating and centralising governmental control over natural resources, the likes of which have not been seen since the colonial era. Today, a large majority of India's population is being increasingly denied access to the natural resources vital for their survival, while the flow of these resources to urban centres, to support luxury consumption, continues unhindered.

The challenge before the Government today is to reverse this trend and to provide for the legitimate needs and aspirations of a growing Indian population, without impoverishing, forever, the generations still to come. The challenge is to establish patterns of resource use which meet our moral obligations to nature and posterity, while being socially just.

B. THE STATE OF INDIA'S ENVIRONMENT TODAY

The present day use and consumption of natural resources is unsustainable. Current trends, if not reversed, would make it increasingly so, spelling disaster for the environment and untold misery for our present and future generations. The facts, as they are known today, are listed below:

- i. Industrial wood consumption is 28 million cu m per annum, but annual forest growth is only 12 million cu m. The remainder is made up by depletion of forests beyond their regenerative capacities.
- ii. Livestock currently requires 932 million tonnes green and 780 million tonnes dry fodder annually. Yet, only 250 and 414 million tonnes respectively are provided. The rest come from grazing in forest land. Over 90 million livestock graze in India's forests, which currently have the ability to sustainably support only 31 million.
- iii. 58.8% of Indian forests have no or inadequate regeneration, mainly because of degradation. Consequently, the productivity of India's forests is very low, averaging 0.7 cu m per hectare, per year. This is only a fourth of the Asian average.
- iv. Fuelwood consumption is estimated at 235 million tonnes per annum, while annual production is only 90 million tonnes, 40 million tonnes from forests

and the remaining from agro wastes. The balance comes from forest capital stock.

- v. India has among the lowest per capita availability of forests in the world, of 0.11 ha, as compared to 0.50 in Thailand and 0.13 in China.
- vi. Every year nearly 6000 million tonnes of topsoil are lost by erosion. These contain over 5 million tonnes of critical plant nutrients, whose replacement value via fertiliser has been calculated to be 2500 crores of rupees.
- vii. Nearly one third (over a hundred million hectares) of India's land is eroded, saline or waterlogged.
- viii. Almost three quarters of dry land farmers have holdings below 2 ha, which are, at present levels of productivity, inadequate for self sufficiency.
- ix. Reservoirs of most dams in India are silting up at rates much higher than those anticipated, thereby reducing their expected life.
- x. The area prone to flooding has tripled since 1960, from 19 to 59 million hectares. Over half of the districts in India have suffered from both floods and droughts, between 1983 and 1986.
- xi. It is estimated that 70% of the surface water sources are polluted and that in large stretches of

major rivers, water is not even fit for bathing, leave alone drinking. Polluted water is the source of most of the diseases that affect, cripple, or kill millions of Indians every year.

- xii. Air pollution in Indian cities is among the highest in the world.
- xiii. No major Indian city is free from the threat of chemical or nuclear hazards. In Delhi and Bombay, over 1000 hazardous units and industries have been identified.
- xiv. Millions of people in rural India are finding it progressively difficult to collect water, fodder, firewood and raw materials essential for their survival.

C. NATIONAL PERSPECTIVE ON THE ENVIRONMENT

The national perspective on the environment can be defined in terms of four major priorities, each supporting the other and, in a sense, defining the approach of the Government to the environment.

1. The first priority is to ensure, for the people of India, equitable and continued access to the natural resources vital for their survival.

Whatever the level of a country's development, four basic elements are always needed for people's survival : fresh air, clean water, fertile land and a "healthy" natural ecosystem. The last three are especially critical in an agrarian society like ours, where a majority of our people are directly dependent on these elements for their survival. Yet we face the 1990s with all these elements severely degraded and depleted, by two centuries of colonialism and four decades of "planned" growth and "development". As a result, an increasingly large number of poor people are being deprived of these vital resources, and their continued survival itself is at stake.

2. The second priority is to decentralise governmental control over natural resources and thereby to reverse the prevailing trend of people's alienation from nature.

Most urban people today are insensitive to nature, and see it as only an economic resource for their

consumption. Urban educational and professional institutions reinforce such insensitivity, but also produce and house a large majority of our planners and decision makers. It is these individuals, in control of the government and articulating its social and economic policies, who have so far made decisions about the use of natural resources. It is assumed that the common person is not sufficiently concerned and informed about nature and natural processes, to make responsible decisions. The common person, especially the villager or tribal, is therefore consistently ignored in the decision making process for even those natural resources on which he or she is directly dependent.

But the resultant centralised decisions have forced the villagers and tribals into impossible situations where, in order to survive, they have to surreptitiously degrade "government" forests and lands, thereby alienating themselves from nature, from the governmental machinery and, often, from each other.

Such an alienation is inevitable where an individual or community has been isolated from the environment, by acts of the government or other institutions enforcing exclusive control and right to manage. It is aggravated when individuals and communities are denied other ways of earning their livelihood, and forced to destroy their own environment. The alienation is complete when industrial and urban demands are allowed to destroy the environment

which local communities, in the name of conservation, were not even allowed to use sustainably.

It has taken forty years of experience to learn that the natural environment cannot be protected by Government alone, often because it has to be protected from governmental activities themselves. Besides, environmental reality in India is too varied to lend itself to generalised policies, or to centralised fiats, however well meaning. But, despite this, governmental and other formal institutional structures, including those at local levels, are still without the will and ability to evolve a consensus of opinion, with the people, on the use and protection of natural resources.

They instruct, order, consult, even evoke participation, but are not able to sit with the people and agree on an optimal solution or strategy, based on the understanding, knowledge and experience of all the participants. Efforts are made to "convince" people, to "educate" them, but rarely to listen to them. It is this lack of a national dialogue and consensus that has reinforced patterns of centralised control on the environment and the consequent alienation. It has, in many parts of the country, transformed traditional social process into a war of attrition which benefits no one, least of all nature.

3. The third priority is to change the prevailing unjust and unsustainable model of development, and the

wasteful pattern of resource use and consumption inherent in it.

The last forty years have seen a steep increase in the demand for all commodities, including bio-mass products and energy. Some of this is due to the increase in population, but much of it is due to the rapid increase in consumerism and the lifestyles of the rich. Our prevailing development model, and the economic system inherent to it, have encouraged and supported this increase in consumerism and the resultant waste of natural resources. The current mechanisms of subsidies and price fixation make environmental degradation economically very attractive. Nowhere is the real economic price, or the ecological cost, of degrading the environment reflected in economic calculations.

As current prices make waste cheaper than conservation, there is little incentive to recycle water, paper or other products, or to conserve energy. Nor is there an incentive to use environmentally "friendly" materials and processes, or to develop such technology. The price of wood, however high, does not reflect even a fraction of the cost of regenerating forests, preventing and mitigating soil erosion, or of the damage caused by floods or droughts, which are aggravated by deforestation. Our fiscal policies encourage us to adopt totally inappropriate technologies, materials, processes, lifestyles and development models.

Technologies for destroying nature, and consuming natural resources, are being adopted every day. New processes are being rapidly developed to utilise natural produce, and existing markets expanded. However, the effort and technology for protecting and regenerating nature lags far behind.

Much of this ecological irrationality is inherent in an inequitable social system, where only a privileged few can enjoy the benefits of destroying nature, while most others face only the consequences.

4. The fourth priority is to ensure internally integrated and coordinated governmental action to protect and regenerate nature.

There has been the absence of an integrated governmental approach to nature and natural resources, and of a policy which integrates environmental concerns with goals pursued by different sectors of the government. The use and allocation of natural resources has been done on an ad hoc manner without either assessing the available stock, or prioritising between different demands. Very often, less important or superficial needs have been fulfilled while more fundamental ones have been denied. Industries and development projects have been allowed to destroy nature while even the most basic demands of rural communities and tribals have been not just ignored, but brushed aside as standing in the way of "progress" and "modernisation".

The lack of a policy, and of the political will and consensus to ensure that development is just and sustainable, has made us careless with nature and encouraged us to follow populist economic stances, with serious ecological consequences. The imperatives of providing food, shelter and livelihood to a nation emerging from an era of colonialism have persuaded us, in the last forty years, to frequently put short term economic goals above sustainability. The immense natural wealth of India has allowed us to do this for four decades, despite the initial ravages suffered in the hundred years or so before Independence. However, today the message is clear. Our society's life support systems are seriously endangered and if we do not begin acting now, disaster is inevitable.

D. THE MAJOR TASKS

The challenge today is to meet our economic objectives in a socially just and sustainable manner, without destroying nature. We do not have the option of saying that this is not possible. If we have to survive, it has to be made possible.

The major tasks before the government and the planning process can, therefore, be summarised as follows.

1. To protect the natural environment
2. To regenerate and restore degraded ecosystems and increase their productivity
3. To decentralise control over nature and natural resources
4. To develop and share an understanding of nature and natural processes
5. To formulate a national policy on nature and natural resources, and an appropriate legal structure in support of the policy
6. To present an annual natural resources budget, to the Parliament, assessing the availability and specifying allocations of these resources
7. To ensure co-ordinated and integrated governmental action aimed at both conserving and regenerating nature and sustainably using natural resources
8. To develop and adopt environmentally sustainable developmental models, lifestyles, technologies, processes, and materials
9. To make governmental bodies and personnel more accountable to the people, for their actions and inactions
10. To monitor the environment

These tasks are not independent of each other, but complementary and sometimes overlapping. Though in a sense they are elements of the strategy for achieving one common goal, they are also goals in themselves. What follows is only the very basic outlines of what each of these goals means, and how they can be accomplished. To ensure that these goals are actually achieved, a far more detailed strategy will have to be evolved.

Many of these tasks are already being performed, with varying success, by the central and state governments. However, it is clear that a much greater effort and investment of time and financial resources is called for, if the current trends of environmental degradation are to be reversed.

1. To Protect the Natural Environment

It is a primary task of the government to protect all natural ecosystems from degradation. The different levels and strategies of protection warranted by different areas, geographical regions, and ecological and social systems, need to be worked out in detail.

For example, a relatively small percentage of representative or unique ecosystems need to be protected from all human disturbance, and maintained as biological reference areas and gene banks. The remaining areas should be put to varying levels of use, keeping in mind their ecological functions (eg. watersheds) and the broad framework set by the

principle of sustainability.

Areas need to be identified not only on the basis of their ecological characteristics, including fragility, but also in terms of the types and severity of threats they face, the source and cause of these threats, and the level of protection they warrant. Much of the forests, range land and pastures, rivers, lakes, wetlands, and coastal ecosystems in India are under varying levels of threat. A comprehensive plan for their protection needs to be drawn up.

1.1 Types of Threats

Broadly speaking, threats are of three types: pollution, over-use and destruction.

i. Pollution is the overtaking of the assimilative ability of nature. When industrial, agricultural and domestic effluents are dumped into water, or on land, or released into the atmosphere, nature is polluted. If these effluents are not bio-degradable, or in quantities and concentrations too large for nature to assimilate, then much greater damage occurs.

ii. The second type of threat is posed by the over-use of natural ecosystems, taxing the productive and regenerative abilities of nature. If forests are clear-felled, or timber and other produce is extracted in excess of the forest's ability to regenerate, then the area is degraded. If the damage is so severe that it negatively

alters the basic soil and water conditions to such an extent that vegetation dies and does not regenerate, then the area loses its ability to heal itself. Water bodies, wetlands, grasslands, mountain ecosystems, aquatic, coastal and marine ecosystems, among others, are susceptible to such a threat.

iii. Thirdly, ecosystems are threatened with physical destruction by various projects and activities. Among the major causes for the physical destruction of ecosystems are industrial, commercial, and environmentally irresponsible developmental activities. Mines dump overburden on surrounding land, and abandon their pits without any effort at putting back the top soil and restoring the vegetative cover. Road builders destroy vegetation, and lay barren large areas of land, by blasting and triggering landslides, and carelessly dumping debris over fertile lands, forests and streams. Dams submerge huge areas and badly designed railway tracks, towns and cities, airfields, military establishments, harbours and ports, factories, and power plants all take their toll on the environment.

1.2 Strategies of Prevention and Regulation

To meet the threats to nature, two broad strategies are possible: preventive and regulatory.

i. Strategy of Prevention: For certain types of threats, the raising of public awareness is adequate. Most people would progressively desist from harmful activities, to

which they have other options, if they are convinced of the dangers. The success of anti-smoking publicity campaigns, in many parts of the world, lend credibility to this strategy. (For details, see Task 4)

Secondly, strict laws, rigorously implemented, can also provide the required deterrence to proposed environmental destruction. It is important to adopt the strategy of punitive deterrence, both through fiscal measures by making wasteful and non-essential consumption very expensive, and through the strict application of strong laws. (also see Task 5)

However, legal and punitive methods are only effective if they are sensitive to the socio-economic constraints of the people. Unfortunately, much of our present laws and regulatory mechanisms do not distinguish between those who have a choice to destroy nature, and those who do not. In fact, they are mostly used against the poor, who are also usually without real options.

Thirdly, there must be a statutory environmental impact assessment of all projects and activities having a potential impact on the environment, before implementation.

Even projects cleared earlier, without an adequate environmental assessment, which for some reason have not yet been completed, should be required to undergo an environmental impact assessment. Based on such an assessment, a decision should be taken to abandon or modify them.

The fourth way of preventing destruction is to regenerate nature and increase the productivity of ecosystems to a point where they are not degraded by existing demands and activities. It must be recognised that, in the long run, legal regulatory methods cannot by themselves protect the environment, or promote a healthy relationship between nature and society, or society and government. Also, one cannot, for ever, deny access to vital resources if no alternatives are available. The strategies for regenerating nature are discussed in another section. (See Task 2)

ii. Strategy of Regulation. Where activities have started, or projects come up, the impact on the environment must be strictly regulated. However, despite past efforts at protecting nature through laws and regulations, the increasing degradation of our water, air, land, forests and wildlife, bears witness to the fact that this approach has not been successful. Apart from having inherent limitations, its application has been half-hearted, without involving the people. Much of the process is carried out by the government at a great remove from the people and often in secrecy. Information about the threats, their sources, and the decisions and action taken by the government is rarely made public.

To protect nature from various threats, it is also required that:

i. A detailed report should be prepared concerning the status of industrial pollution, identifying the sources and indicating, in a realistic and time bound manner, the measures required to be taken. This report should be presented to the Parliament and the Nation and the proposed time bound action initiated. The progress of the action should also be made public at regular intervals.

ii. A similar report should be prepared about domestic and agricultural pollution, especially through pesticides, with similar action and reporting components.

iii. The Central and State Pollution Control Boards should be strengthened to discharge their responsibilities more satisfactorily, and their working should be made public, so that they are answerable to the public for their actions and inaction.

iv. Comprehensive and realistic standards for environmental pollution, and procedures and standards for assessing environmental damage, should be formulated so that the arbitrariness currently existing in these matters is done away with.

v. To facilitate public participation in prevention and control of pollution and environmental degradation, the necessary technical help, at decentralised levels, should be provided to members of the public and NGOs, through designated institutions. These institutions would be obliged to investigate and provide information required to enable

aggrieved/concerned persons to move the government, and where necessary the courts, or take other appropriate action, with a view to actively prevent environmental pollution and degradation. For this to happen, central, state and local governments should set up appropriate mechanisms which can speedily respond to, investigate, and dispose of public complaints. The proposal to set up environmental courts is meant to help this process. But whether or not these are set up, the aims for which they have been proposed need to be pursued vigorously through instrumentalities of the State.

vi. To encourage people's vigilance, some incentives can be offered for the reporting of actual instances of violation of laws relating to pollution, forests, wildlife and other environmental issues.

vii. To decentralise the regulatory functions of the Government, especially in relation to pollution, essential training, and requisite equipment, should be provided to NGOs, representatives of communities, members of local institutions like schools, colleges, co-operatives, panchayats etc. This would enable local level monitoring of pollution, and encourage the affected people's involvement in preventing and controlling it.

2. To Regenerate and Restore Degraded Ecosystems

Today, much of nature lies ravaged. Forests, pastures and land are degraded, rivers and lakes polluted,

the air too dirty to breathe, and many species of animals and plants dying or dead. This degradation has a major impact both on the subsistence standards of much of India's poor, further impoverishing them, and on the ability of the environment to be productive. It is, therefore, crucial to regenerate these ecosystems, both for their own sakes, and for the sake of people's welfare and survival.

As a start, it is imperative that those individuals and organisations who degrade the environment should be either penalised or, what is much better, obliged, by law, to regenerate and restore the areas degraded by them.

For most of the degraded ecosystems, it is important to involve the people, especially the rural communities, in the task of ecological restoration and regeneration. First, without the local people's participation the system cannot be adequately restored. Secondly, such restoration tasks provide needed alternative employment inputs.

"Right to work" and Ecological Regeneration

The government has made a commitment to provide "right to work" to the citizens of India. From the various strategies available to the government, it is clear that employment related to regeneration and restoration of ecosystems, especially if these involve the tribals and economically weak segments of the society, would be among the most advantageous both in terms of costs and from the

viewpoint of social justice and sustainability. The same applies to generating employment opportunities to those displaced and rendered homeless and jobless as a result of large development projects.

If millions of jobs are to be provided in the construction sector, it would involve huge financial investments, diversion of scarce raw materials, and transportation of materials over long distances. Similarly, jobs in the industrial sector would involve all these, along with requirements of energy and markets. In the agricultural sector, adequate cultivable land would be hard to come by, and there would also be a continuously escalating requirement for various inputs like fertilisers, pesticides, and irrigation. All these could also be environmentally damaging. Better, that existing agricultural lands are made more productive, through ecological regeneration, and soil and water conserved and replenished, otherwise even the current agricultural production would be threatened.

The creation of jobs, for ecological restoration, has relatively few requirements and great returns. There exist huge areas of degraded land (between 60 and 100 million hectares) which could be made available for regeneration and restoration. Apart from wages, little other input is required, especially if the activities are organised at local levels by the local communities themselves.

Much of this land needs basic water and soil conservation measures, some amount of plantation work, and protection against pressures. Very soon this land would start producing fuel, fodder and raw materials for village consumption in a sustainable manner. This would not only meet the basic needs of local communities, but allow them to sell the surplus, thereby earning money for themselves and ensuring availability of biomass to the nation. By protecting, regenerating and restoring degraded land, the pressure on the remaining land, forests and pastures could also be reduced to within sustainable levels. Similar activities could be designed to restore, in an integrated manner, other natural areas.

Of course, if local communities are to restore and regenerate degraded ecosystems like land and forests, they must be allowed adequate access to these ecosystems. They must also have a right to a just share of the produce of these rejuvenated ecosystems. It would, therefore, be necessary to involve state governments, especially state forest departments, in this effort and to change existing laws, to ensure for the people such access and rights.

The experience, in West Bengal, with Forest Protection Committees, can serve as an example of a successful effort at shared responsibility. Starting with a pilot project in the Arabari forest tract, today 1250 villages in West Bengal have Forest Protection Committees, covering 152,000 hectares of forests. The villagers have

exclusive rights to restrict access to, and use of, minor forest products, and a share in the timber. Consequently, the costs of regenerating these forests have come down to 5% of what they used to be, before the people took over.

To take up such work, there is need to restructure and expand the National Wastelands Development Board and to link its activities to the promised "right to work". It should have the responsibility of liaising with State Governments to formulate and support programmes of ecological regeneration and restoration, by involving the people and local communities.

3.To Decentralise Control

The Government cannot protect, regenerate and ensure sustainable use of natural resources on its own. Besides, centralised control over nature and natural resources has meant that "national priorities", which often mean the priorities of the rich and powerful, get precedence over common and local needs. It is essential, therefore, to decentralise control over natural resources. However, decentralisation, in this context, does not mean the transfer of control from central to state governments, or from state governments to district authorities. In reality, it means transferring control from the government to the people.

It is, therefore, imperative that control over their local natural surrounds and resources be progressively

transferred to the people. To make it possible for the people to responsibly exercise this control, it is important that conditions be created where their own social and institutional structures can grow stronger. The people must also have access to information, and to professional knowledge, and must be able to call upon technical bodies for advice and support. However, at the same time, they must not be forced to act upon other peoples expertise or "wisdom", but be left free to choose their own path of action.

The Government must support such a simultaneous process of empowerment and back up services for the people, and be willing and able to intervene when called upon, or when mutually agreed norms are being violated.

The responsibility, therefore, becomes a shared one, where local control rests with local communities : to be exercised within conventions and norms evolved by the people, in consultation with the Government. The Government helps and supports this process in whatever way it is called upon to do so, but can only intervene on its own, perfectly at local levels, if the agreed upon conventions and norms are violated.

Such a system is absolutely essential in the case of tribals and other traditional communities who are totally dependent on nature. The traditional wisdom and lifestyles of such communities must be respected and any changes affecting them must be planned and implemented after consulting them.

It is required to start the process of identifying communities, and areas, where this process of decentralisation can begin, on an experimental basis. Local voluntary organisations must be involved in this effort, and in formulating the detailed conventions and guidelines which will determine the use and protection of the area. This effort must be gradually expanded, to cover more areas and communities, and modified on the basis of experience from the initial experiments. Much can already be learnt from successful similar efforts, like the ones in West Bengal, discussed earlier (Task 2).

Even in urban areas, the protection of water bodies, or green areas, can be progressively handed over to the community, initially on an experimental basis.

4. To Develop and Share an Understanding of Nature and Natural Processes

There has been, for the last many years, a tendency of isolation and distancing of professional bodies from the people. As a result of this, the growing scientific understanding of nature and natural processes has been shared or developed in partnership with the people, especially the rural and tribal communities who have their own traditional wisdom on these matters. This has resulted in at least two distinct epistemological cultures, one based on experience and historical understanding, and the other mainly on modern science and theoretical hypotheses. The synthesis, and consequent enrichment, of these two cultures has not been

adequate, resulting in a breakdown of communication, even a mutual hostility, between scientists and professional environmental managers, on the one hand, and those communities who have been interacting and living with nature for centuries, on the other.

The social alienation of many of the modern sciences has led to developments, in the "spirit of discovery", which have been harmful, sometimes even disastrous, to human well-being. The huge amounts of money being spent in research and development on armaments is one glaring example of this. The other is the amounts spent on hazardous technologies that may fulfil immediate consumer needs to elite strata but lead to massive accumulation of waste that cannot be absorbed or recycled in the foreseeable future.

It is, therefore, important to link research and education with grassroots reality and imbide it with social and moral values. It is not enough to do research in libraries and laboratories. The tradition of action research, of discovering by doing, must be strengthened. The common forms of dissemination, through the printed word or through showing films and giving lectures, are not enough. Much greater learning is gained through actually observing, on the ground, the results of applied research and of social movements.

The current research, training and awareness programmes need to be reviewed for their content and methodology. Research areas must be selected with care, so that effort and resources are not wasted in studying peripheral issues while important questions remain unresolved. Though there is need for pure research, this should be seen more as a task of universities and professional bodies, than of government departments and institutes. The thrust of research activities within the Ministry of Environment and Forests, and the Planning Commission, and within their associated institutes, should be related to specific social, managerial and scientific issues relevant to solving problems on the ground.

It is proposed to set up a national body, preferably through an act of Parliament, which would have members from among different professions and disciplines, as also from among NGOs and a cross section of the public. It would be the responsibility of this body to identify research priorities and monitor the state of research in the country, on nature and natural resources. A monitoring network, discussed later, should also function under this body.

The disbursement of at least a part of the research grants must be decentralised, with a proportion of available funds reserved for short-term local studies related to ongoing threats or problems. The allocation of these funds, and the selection of suitable studies, should be made by

committees of concerned academics and representatives of NGOs, constituted in different regions for the purpose. A part of the research funds allocated to learned institutes should also be reserved for short-term research studies aimed at investigating specific local problems.

Environmental training and education of professionals and administrators is crucial to the establishment of an environmentally rational governmental and social system. Unfortunately, this aspect has been seriously neglected to date. It is proposed, therefore, to develop a detailed training plan, based on the perceived needs of professionals and administrators and in keeping with the national perspective on environment. Such a plan could be implemented with the help of selected institutes and NGOs. A major stress of such training programmes would be to discuss how economic development can be pursued without being socially and environmentally destructive, but by protecting and regenerating nature and strengthening social institutions.

Of equal importance is the task of raising public awareness of environmental issues, especially among the youth. Apart from building up public opinion in support of environmental protection and regeneration, awareness programmes must also be aimed at encouraging non-formal participative activities which develop a sensitivity to social and ecological justice and a commitment to act in its defence.

5. To Formulate Policies and Laws

5.1 The Policy

An important task before the Government is the formulation of a national policy on nature and natural resources. This policy should contain sections on major elements like land, water, forests, and air, and on significant sectors like agriculture, energy, housing, industry, mining, roads, etc. This policy must be evolved in consultation with the people, and must have the support of the government, across departments and levels.

Such a policy, and the resultant action plans and laws, would include strategies of the Government for ensuring just and sustainable development. It is essential, therefore, that the finalisation of the policy is preceded by a national debate on the prevailing model of development, and its options and inevitabilities (See also Task 8). The policy must take a position regarding the environmental rights of the weaker sections of society, like tribals and nomads, and of women and children, especially in terms of access to, and control over, natural resources.

From such a policy must follow national, and regional, land use plans, which specify long term land use patterns for the country and for each region.

5.2: The Laws

Several laws relating to the environment have been enacted in the last two decades, but these merely attempt to regulate the after-effects of natural resource use and industrial enterprise. The basic laws which regulate natural resource acquisition and distribution are almost all of colonial heritage, of little relevance to present day environmental and social concerns in India. Amongst these are the Land Acquisition Act, The Mines and Minerals Act, the Indian Forest Act, The River Boards Act, and various irrigation and other acts, controlling land, forests and water resources.

Unless these laws, controlling use and distribution of natural resources, are in tune with the current environmental and social thinking, there is little hope of establishing a system of just and sustainable development. What is required, therefore, is a review of existing laws to bring them in line with the proposed natural resources policy. These laws must also reflect the social and economic reality of our country, and recognise compulsions of poverty and lack of real choices as mitigative factors.

All relevant laws must grant locus standi to non-governmental individuals and organisations. These laws, and the related procedures, should be "people-friendly", accessible to all, and should be backed by comprehensive and realistic standards for various environmental parameters (water pollution, land pollution, etc.), ensuring that they

take into consideration accumulative impacts, both over time and from multiple sources.

6. To Present an Annual Natural Resources Budget to the Parliament

It is proposed that the the Government of India would present an annual natural resources budget to the Parliament, which would outline the proposed use of water, land, forest and other resources. This budget would be based on a realistic assessment of the state of the resources, and would allocate the surplus available over ecological requirements.

For example, it would allocate, for human use, the surplus waters of rivers and lakes, beyond what is required for maintaining their ecological balance. Similarly, it would allocate surplus forest resources, or land.

The allocations would be both for the local communities dependent on these resources, and for diversion to urban areas, industry, and development projects, reflecting the priorities of the government, as spelled out in the proposed natural resources policy (Task 5). The assessment of the available "stock", and the usable surplus, would be based on research and detailed monitoring (Tasks 4, 10).

The "revenue" of such a budget would consist of planted or regenerated forests, enhanced water availability

through catchment area treatment or conservation of water, and availability of clean air and water through progressive control and prevention of pollution.

The financial budget of the government, and the plans of central ministries and state governments, would be within the parameters of the natural resources budget.

7. To Ensure Co-ordinated Governmental Action

Among the most important tasks before the government is to ensure coordinated governmental action on environmental issues. The last decade has seen a growing conflict of views and interests between various central ministries, and occasionally between state and central governments, on questions of environmental protection. These conflicts have been behind the frequent difference of perceptions, within the government, on policies, programmes and projects. Another manifestation of these conflicts has been an unfortunate polarisation of views, where different sections of the government, and sections and classes within society, see themselves as adversaries, rather than as partners contributing to sustainable development. All this has resulted in a dissipation of national energies and negatively affected efforts at both conservation and development.

The proposed strategy for ensuring co-ordinated governmental action involves two tasks. First, it involves the formulation of a natural resources policy and the

presentation of an annual natural resources budget. Both these have been discussed in greater detail elsewhere in this paper (Tasks 5,6).

Secondly, based on the proposed natural resources policy, there must evolve a process of planning and assessment for all policies, laws, programmes, and activities, which could have an impact on the environment. It should be the responsibility of the Planning Commission to ensure that plans of different ministries and states have been assessed and approved after the environmental implications have been carefully considered. This would, on the one hand, prevent the forcing of ministries and states into the role of adversaries, and, on the other hand, keep within bounds the building up of interest groups around projects, programmes, and policies whose environmental viability is examined much after they have been formulated, and occasionally, implemented.

To assist the ministries and states in this task, it is proposed to set up an environmental planning cell, at the Planning Commission, with the responsibility of working with various ministries and state governments in formulating their plans and activities in an environmentally acceptable manner. This cell would be required to assist ministries and states to integrate, into their activities, developmental priorities with ecological concerns.

Some of the areas requiring such integration, along with possible thrusts, are listed below:

i. Irrigation: Strategies to optimally achieve irrigation targets in states, and through central intervention, by minimising ecological damage. Some of the thrust areas could be: conservation of water; development and adoption of alternate water harvesting technologies, especially involving micro-irrigation projects and traditional methodologies; identification and adoption of water saving agricultural practices; development and adoption of environmental management strategies for irrigation projects.

ii. Energy: increased use of alternative and non-conventional sources; energy conservation; developing and adopting mini-hydel generation capacities; environmentally managing thermal, hydro and other energy programmes.

iii. Agriculture and Rural Development: minimising the use of pesticides and inorganic fertilisers; developing and adopting ecologically regenerative land and water practices; development of low input, organic, agricultural practices, especially in arid zones; designing and adopting environmentally regenerative and protective rural development programmes.

iv. Industry: prevention and control of pollution, and control of hazards; optimal location of industrial units; recycling of industrial wastes; developing and adopting

energy efficient technology; developing and adopting environmentally friendly processes and materials.

v. Urban Development, Housing and Rehabilitation: managing urban environments; developing and adopting environmentally harmonious materials and designs; ensuring a right to housing and to the natural resources required for the fulfillment of this right; reviewing the state of rehabilitation and developing and adopting socially just and environmentally sustainable rehabilitation strategies.

vi. Others: Some of the other areas of interest would be health and occupational health hazards (Ministries/Departments of Labour, Health, Chemicals and Petroleum); environmental education (Education); vehicular pollution (Transport, Industry); coastal, marine and aquatic environment (Fisheries, Ocean Development, Shipping, Inland Waters); environmental aspects of mining and oil and gas extraction (Mines, Coal, Steel, Petroleum); fiscal policies affecting the environment (Finance); data and information about nature, natural processes and the use of natural resources (Indian Remote Sensing Organisation, Census Directorate, Ground Water Board, Meteorological Department, National Sample Survey Organisation, Departments of Statistics, Irrigation boards and departments, etc.); environmentally safe technologies (Science and Technology, Industry, Non-Conventional Energy Sources).

8. To Develop Environmentally Sustainable Alternatives

Considering the overpowering imperatives within the Indian society, it becomes difficult to hold up the pursuance of economic goals, albeit short-term, on purely environmental grounds. It is important, therefore, to develop and adopt alternate methods of achieving the important economic goals through the use of processes, technologies, and materials, which are environmentally sustainable. In fact, it has now become crucial to adopt a model of development which is just and sustainable. But to do this, the thinking and approach of many people and the government has to be changed. This can only be done gradually, by making it progressively difficult to adopt non-sustainable processes, technologies, and even life-styles, and progressively attractive to adopt sustainable ones.

To this end, a major effort is required to formulate a national development strategy, which is socially just and environmentally sustainable. This must be evolved as a consensus strategy, with support from all major political parties, as it can only succeed if imported by all sectors of the government, by large segments of the public, and over the long term. Such an effort should be initiated at the highest level in the country, and with the involvement of national leaders, professionals, social activists, NGOs and community leaders.

Meanwhile, as an immediate task, it is proposed to set up a task force to identify and prioritise those technologies, processes, materials, programmes and fiscal and other policies that are environmentally destructive and unsustainable, and therefore in need of immediate replacement. Some of the thrust areas for this task force could be: review of the pricing and tax structure to rationalise prices and taxes so that it becomes cheaper to adopt environmentally friendly and socially just options, where these are available; alternatives for wood based products; for energy intensive products and processes; for polluting processes, technologies and materials; for non-recyclable products and materials; adopting environmentally appropriate building designs and materials; environmentally appropriate city and town planning; among many others.

9. To Make the Government More Accountable

To be a watchdog of environmental interests should not be the function primarily of the government, but of the people. In fact, the people should be allowed and encouraged not only to monitor the environment, but also the government's role in protecting it.

It is expected that many of the earlier listed tasks would contribute to governmental accountability. For example, the enunciation of a policy, and the presentation of a budget, dealing with natural resources (Tasks 5,6), would force the Government to make public their environmental

priorities. The government can then be held responsible for following inappropriate priorities, or for actions and inaction which are in deviation of its policy and budget. This would remove much of the ad hocism that has marked the allocation of natural resources in the past, and allowed the government to function arbitrarily, without any accountability.

Some of the other measures needed to enhance governmental accountability are listed below:

a. Ensuring freedom of information. The main impediment in ensuring governmental accountability so far has been secrecy. It is proposed, therefore, to make it statutorily binding on the government to make public all relevant information concerning nature and natural processes, and governmental decisions and actions concerning them.

b. Having laws and procedures which allow citizens to intervene on matters concerning the allocation, use and protection of natural resources. Many of the laws dealing with nature and natural resources do not, at present, allow access to non-governmental individuals and organisations. This must be urgently changed. (See task 5)

c. Involving concerned and affected citizens in the process of decision making, through committees and public debates. This has to be made a mandatory part of major decision making processes.

d. Fixing responsibility, and taking action, against officers guilty of action or inaction in violation of environmental policies and laws. This is especially important when it is based on a complaint from the public.

10. To Monitor the Environment

Considering its critical state, it is important to set up a system by which important parameters of the natural environment are constantly monitored. This must be seen as an obligation that is fulfilled by the government through its institutions and departments, but one in which an active role is assigned to environment groups and activists and organisations of the people at large, carried out at both macro and decentralised levels.

The governmental machinery should be ready to act, where urgent preventive or remedial measures are required, and to ensure that all precautions are being taken to safeguard the environment. Crucial to performing this task are two aspects : the capacity to enforce strict adherence to norms, and access to critical information.

At present, various institutions like the Zoological and Botanical Surveys of India, the National Remote Sensing Agency, the Forest Survey of India, and the Pollution Control Boards are involved in gathering information on, and monitoring, the environment. However, despite this, reliable information on most environmental parameters is not easily available. Many projects and

activities are delayed or inadequately assessed for the lack of even basic information. Also, even the little information that is available is often not made public. In short, the ability of departments of the government, entrusted with the task of protecting and preserving the environment, to meaningfully monitor it, is still very limited.

It is proposed, therefore, to set up a comprehensive environmental monitoring network, that would have the responsibility of regularly monitoring the environment and presenting annual reports to the Parliament and the public, through the mass media and dissemination to environmental NGOs.

E. SUMMARY OF RECOMMENDATIONS

It is proposed to protect the environment through a package of measures, involving among other things prevention through education, deterrence and assessment, and through regenerating degraded ecosystems; regulation through strengthening of laws and procedures, and by making them more accessible to the general public. It is sought to promote ecologically regenerative employment opportunities which would be sustainable and beneficial to the environment, and go a long way towards fulfilling the promised "right to work".

Control over nature and natural resources is sought to be decentralised, from the government to the people, and

it is proposed to make environmental research and education more responsive to grass roots reality. It is proposed to set up a body, preferably through an act of Parliament, with the purpose of encouraging and supporting research on, and monitoring of, nature and natural processes. It would be the responsibility of this body to keep the Parliament and the Nation informed about the state of the environment.

It is proposed to formulate and implement a national policy on nature and natural resources, supported by appropriate laws, and to present an annual natural resources budget in Parliament. By ensuring prior appraisal of plans and policies, in accordance with the policy and budget, and by setting up an environmental planning cell, in the Planning Commission, to assist ministries and state governments, it is proposed to ensure coordinated governmental action, across departments and levels, on environmental issues.

A major effort is needed to formulate a national strategy for sustainable development, and to evolve a political consensus around it. It is also proposed to set up a task force to look into the question of developing and adopting alternate, environmentally sustainable, technologies, processes and materials.

As a method of ensuring that the government's efforts towards achieving these tasks neither flag nor are diverted, it is proposed to make governmental bodies and personnel more accountable to the people through various

methods, including the provision of public access to information regarding governmental action and inaction.