

Chapter – 22

Environment & Forests

The Ninth Plan Objective

The Ninth Plan for Environment and Forests embodies the spirit of a 1992 global initiative called Agenda 21*¹ in recognition of a basic premise: environmental management and economic development are mutually supportive aspects of the same agenda. A poor environment undermines development, while inadequate development results in lack of resources for environmental protection. The Government of India's policy on Environment & Development of June 1992 encompasses a wide spectrum of developmental sectors whose policies impinge heavily upon environment and require intersectoral policy integration and coordination. Some such key sectors are agriculture, irrigation, animal husbandry, forestry, energy generation and use, industrial development, mining and quarries, tourism, transport and human settlements. At present there is no institutionalised policy - integrating and coordinating mechanism and the approach to environmental protection is compartmental with extremely indifferent results.

Pollution in Yamuna

Typically, the Yamuna Action Plan shows up lack of an integrated approach to executing a project. To illustrate, the sewer system of Delhi had lost 80% of its carrying capacity on account of age, siltage and poor maintenance, but this fact came to light only after the setting up of sewage treatment plants for the city. The result is that only 20% of the domestic waste water is being treated; the rest flows through storm water drains directly into the river. Even the treated effluent is thrown back into filthy drains as cent percent interception of sewage at the treatment points has not been achieved. The sewage treatment plants mostly remain under-utilised and, where utilised, the effect on the water quality is negligible. The treated waste water is carried along with the untreated into the Yamuna. Further, over-extraction of water from the river for irrigation cuts the minimum flow required for maintaining ecology of the river and for diluting pollutants that pour into it. A number of slums and shanties, unserved by any sewerage system, also add their bit to make the river an open sewer. The importance of integrating policies and dovetailing activities appropriately cannot be overstated.

2. Clearly, the Policy Statement on Environment & Development stipulates that economic growth indicators like GNP and GDP would include depletion costs of environmental resources, that the Government would prepare each year a natural resources budget reflecting the state and availability of land, forests, water etc. and further that these resources would be rationally allocated in keeping with principles of conservation and sustainable development. Yet no progress has been made in this direction since the Policy Statement. GNP and national income do not reflect environmental degradation or consumption of natural resources. National income accounting without environmental

* Agenda 21 is a global action plan adopted by over 100 heads of Government at the Earth Summit in Rio de Janeiro, Brazil, in 1992.

accounting limits the information available to policy makers for gauging the impact of economic activity upon the environment in its role both as a “sink” for waste and a “source” for development. It is, therefore, essential that a natural resources budget is placed before Parliament along with the economic budget each year and a State of the Environment report is presented along with the Economic Survey. A similar exercise needs to be mandated for the states.

3. Under the Environment (Protection) Act, 1986, the Central Government has wide powers to take measures to protect and improve the environment and can mandate the States to present a natural resources budget and a State of the Environment report before their legislatures to ensure judicious use of natural resources for sustained development. This should entail an accounting of States’ natural resources, both renewable and non-renewable, their quantity and quality, the nature of development activities that may be undertaken on the basis of the resources available and preparation of an action plan for sustainable development, abatement of pollution and restoration of the health of natural resources. Such accounting of natural resources by States would also be used as an input into the national natural resources budget to ensure that information regarding the ecological capital available for development is taken into account while shaping national policies. Such an approach would help mitigate and even prevent ecological disasters such as drought, for example. The capacity building required for formulating such environmental agenda would have to be provided through the Ministry of Environment & Forests (MOEF).

Financial Allocations:

4. Details of approved outlay and actual expenditure during Eight and Ninth Plans are given in Table 1. As a percentage of the total plan outlay of state and central governments, the allocation to the Environment and Forestry Sector is around one per cent. However, even the low level of outlay is not being fully utilized. The level of external assistance received has declined both in nominal and real terms: Rs.317 crores in 1997-98 but only Rs.234 crores in 1998-99 and further declined to Rs.189 crores in 1999-00.

Table 1: Central Plan Outlay/Expenditure (In Rs crores)

Year	Environ ment	NRCD	Forests & Wildlife	NAEB	Total Amount	% of Total Plan Outlay
8 th Plan outlay	325.00	350.00	250.00	275.00	1200.00*	0.48
8 th Plan expdr.	406.95	314.07	422.24	488.64	1631.90	
9 th Plan outlay	859.84	700.00	854.00	600.00	3013.84	1.1
1997-00 outlay	600.4	500.7	568.8	220.5	1947.8	0.64
1997-00 expdr.	420.6	367.2	482.4	236.4	1506.5	0.54
2000-2001 outlay	242.20	210.05	253.75	144.00	850.00	0.72

* Subsequently revised on year to year basis to Rs. 1797.50 crore.

Environmental Issues

Air & Water Pollution

5. **Outdoor Air Pollution:** - Industries, coal-based thermal power stations, vehicles and biomass burning are main sources of air pollution in urban areas. The ambient air quality has deteriorated all over the country, especially in urban and semi-urban areas. The Time Series data for 1995-98 on ambient air quality recorded for 23 cities reveals that Suspended Particulate Matter (SPM) levels remain critical (above $210 \mu\text{g}/\text{m}^3$) in 12 cities, though down marginally in most of those cities during this period. In small to medium towns such as Indore, Ahmedabad, Patna and Ludhiana, the SPM levels are higher than those prevailing in metro cities. Sulphur Dioxide and Oxides of Nitrogen levels have registered an upward trend, but they remain well within the National Ambient Air Quality Standards (NAAQS) in all the 23 cities.

Control of Vehicular Pollution

- Twenty year-old vehicles were prohibited from plying, followed by phasing out of 17-year old and 15 year old vehicles in Delhi.
- Registration of new auto-rickshaws with front engine has been banned in Delhi from May, 1996
- Improvement in engine technology is sought through implementing Euro I (all vehicles, except 2/3 wheelers) and Euro II (for private non-commercial vehicles) norms of emissions.

Improvement of fuel quality

- Unleaded petrol has been introduced in Metro Cities and State Capitals. Refineries have been asked to ensure the benzene content in unleaded petrol within the limit of 5% (v/v) as prescribed for the leaded petrol in 1996 for the entire country and 3% (v/v) from 1998 for Delhi and other Metro cities.
- Sulphur in diesel supplied in Delhi and Taj Trapezium reduced to 0.125% in 1997
- It was expected that diesel with 0.25% sulphur be available throughout the country by September, 1999.
- In order to minimize the pollution and traffic hazards caused by tankers on the road, GAIL has taken the initiative of transporting LPG through pipelines.
- These steps have resulted in reduction of the pollution load of Delhi. Lead levels have reduced by as much as 97% from the 1995-96 levels.

Tightening of vehicle emission norms

- Emission norms for cars were tightened in the country by 50% as compared to 1996 norms.
- The norms for the year 2000, notified in August 1997 under the Motor Vehicles Rules for the entire country, require major modifications in the engine design especially in regard to fuel injection system.
- India has adopted the Euro I and Euro II norms for vehicle emissions. In Delhi Euro I norms have been enforced since 01 June 1999 and the Euro II would come into force from 01 April 2000.
- MOEF notified the specification for 2-T oil for Two-Stroke Engine, which became effective from 01.04.99 throughout the country.

Traffic management

- An efficient public transport system is needed urgently to reduce the number of people opting for individual vehicles.
- With regard to traffic management, a lot needs to be done. More fly-over and by-pass are needed to ensure a smooth flow of traffic.
- Flexible office timings may need to be considered to distribute the heavy office hour rush over a longer time period

6. **Indoor Air Pollution** - Burning of unprocessed cooking fuels in homes causes indoor air pollution particularly in rural households which rely predominantly on bio-fuels such as cow-dung, fuel-wood, and crop residues. Mineral coal is also used in some households. Pollutants released in closed, unventilated places are far more dangerous than those released outdoors. Acute Respiratory Infection (ARI), Chronic Obstructive Pulmonary Disease (COPD) such as bronchitis, lung cancer, blindness, TB, prenatal effects (low birth weight etc) cardiovascular disease and even asthma are being attributed to Indoor Pollution. Women and children are the main victims.

7. It is estimated that indoor air pollution in India's rural areas is responsible for at least 5 lakh premature deaths annually, mostly of women and children under 5. This accounts for 6% - 9% of the national total measured in terms of Disease Adjusted Life Years. These estimates make the health impact of indoor exposure larger than the burden from all but two of the other major preventable risk factors that have been quantified, malnutrition (15 per cent) and lack of clean water and sanitation (7 per cent).

8. Although better cooking technology, ventilation and extension work are immediate requirements, expert opinion suggests that moving up the energy ladder is the most important need. Since biomass is obtained by poor rural households without any direct financial cost, the shift does not seem practical in the short run, unless a highly cost-effective and innovative approach is formulated. Local and global dimensions of indoor air pollution are not altogether divergent. Apart from death and disease occurring hand in hand, there is also an adverse impact on climate through the release of greenhouse gases. This convergence justifies the flow of global financial resources, perhaps through Global Environment Fund (GEF), to support subsidised access to non-fossil based fuels for cooking in far flung, difficult and sparsely populated areas. Proposals for seeking external assistance to deal with indoor air pollution need to be explored and formulated.

Global Health Burden of Indoor Air Pollution

In India, half a million deaths each year are attributed to indoor pollution from traditional biomass fuels. A similar study in China found over 700,000 premature deaths per year from household use of solid fuels (split about 2 to 1 between biomass and coal), with more COPD and lung cancer and less ARI than for India. Since India and China together account for approximately 60 per cent of solid-fuel-using households in the developing world, this implies that, worldwide, about 2 million premature deaths each year could be attributed to household solid fuel use. Depending on the number of young children in the total, indoor exposure would account for 4-6 per cent of the global burden of disease. By comparison, urban air pollution is estimated to be responsible for 1-2 per cent of the global disease burden.

9. **Water Pollution** - The Central Pollution Control Board (CPCB) has been monitoring water quality of national aquatic resources in collaboration with the State Pollution Control Boards (SPCBs). This is done at 507 locations comprising 414 stations on rivers, 24 on ground water, 36 on lakes and 32 on canals, creeks, drains and ponds. The results indicate that organic and bacterial contamination continues to be critical forms of pollutants in aquatic resources. In more than 1/3 of the samples, the Bio Chemical Oxygen Demand (BOD) levels are higher than the prescribed level of 3 mg/litre. Similarly, total coliforms exceed the prescribed norm of 500 MPN/100 ml in more than 50% of the samples. The position with regard to faecal coliforms is even worse.

10. The Yamuna is the most polluted river in the country with high BOD and coliform levels in the 500 km. stretch between Delhi and Etawah. Other severely polluted rivers are the Sabarmati at Ahmedabad, the Gomti at Lucknow, the Kali, Adyar, Coum and Veghai at Madurai, the Musi downstream of Hyderabad, to mention only a few. So are river stretches of the Ganga, downstream of Kanauj, Kanpur, Allahabad, Varanasi and Trighat , the Godavari, downstream of Nasik, Nanded and Rajamundry, the Cauvery, downstream of Rangapattna, the KRS Dam and the Satyamangalam Bridge; the Krishna between Mahabaleshwar and Sangli; the Tapi between Neplanagar and Baranpur, the Mahanadi, downstream of Cuttack, the Mahi between Badanvar and Vasad, the Brahamani, downstream of Rourkela, Talcher and Dharmshala.

11. Water pollution is caused by industrial discharge, irrigation run-off and untreated sewage. About 75% of the wastewater produced is from domestic sector. Sewage treatment facilities are inadequate in most cities and almost absent in rural India. Only 25% of Class I cities have wastewater collection, treatment and disposal facilities. And fewer than 10% of the 241 smaller towns have wastewater collection systems. Not more than 20% of all wastewater generated in Class-I cities and 2% in Class-II towns is treated. The water quality even in Delhi is not of the desired standard.

12. **Ninth Five Year Plan Water Quality Initiatives** - The Ganga Action Plan (GAP) Phase-I, National River Conservation Plan and National Lake Conservation Plan are three principal components of water quality schemes. Under GAP-I started in 1985, a capacity to intercept, divert and treat 873 mid out of 1340 mid of sewage generated in 25 Class-I towns on the banks of Ganga was to be created. Against this, a capacity of 835 mid has been created and 258 schemes out of a total 261 schemes have been completed. Although the project was expected to be completed within five years of the Seventh Plan, is continuing into its 15th year. The time and cost over-runs have been attributed to the fact that such a scheme was taken up for the first time in the country without any preparatory work in project formulation and planning. Also, states have been taking a lukewarm interest in implementation. In the Ninth Five Year Plan, this scheme has been converted from 50:50 sharing Centrally Sponsored Scheme (CSS) into a 100% CSS. In spite of this, assets created are not being adequately utilized because of lack of operation and maintenance funds. Progress of other River Action Plans has been equally slack primarily because of slow preparation of Detailed Project Reports (DPRs) by the State Governments and withholding of Central Government funds from executing agencies. A solution to the problem of operation and maintenance of assets under various National River Conservation Directorate (NRCD) programmes needs to be urgently found. Lack of motivation on the part of state governments in this national programme and the tendency of the programme degenerating into a routine municipal function needs to be seriously addressed.

13. A National Lake Conservation Plan which was carved out of the Wetland Programme to focus on urban lakes suffering from anthropogenic pressures has not taken off for want of assistance from foreign funding agencies as required by the Cabinet Committee on Economic Affairs. The Dal Lake Conservation Plan which was approved by the Planning Commission and Rs 25 crore released to the State Government as additional Plan assistance has also been slow to take off. In the meanwhile the squatter population on the lake seems to go on

increasing.

Industrial Pollution

14. Pollution Control Board has identified 1551 large and medium units in 17 categories of highly polluting industries which are contributing most to the pollution load. As per the decision of National River Conservation Authority, the CPCB has directed authorities to ensure that the polluting industries install requisite pollution control systems within specified time frame. As on 30.9.1999, 476 out of 851 units complied with the directions and 130 were closed down.

15. **Common Effluent Treatment Plants** - Under a scheme for Common Effluent Treatment Plants (CETPs) in a cluster of small-scale industries, a subsidy of 25% of the project cost each from the Central Government and the State Government is provided. A 30% cost is met through financial institutions as loan and the balance 20% is contributed by the members of the CETPs. So far, 88 CETPs have been approved for financial assistance. An independent evaluation of this scheme needs to be undertaken.

16. It has been found during an evaluation of the State Pollution Control Boards by the Project Evaluation Organisation PEO that the posts of Chairmen of the Pollution Control Boards are occupied by politicians. Full-time technically competent and qualified Member-Secretaries are absent and the posts supposed to be filled by technical experts and representatives of local bodies are lying vacant.

17. **Hazardous Wastes** - Safe disposal and handling of hazardous wastes is emerging as a problem area. An estimated 10,504 units generate such waste in the country. Current estimates are that about 5 million tons of hazardous waste is generated and it is largely concentrated in highly industrialised states such as Maharashtra, Gujarat, Andhra Pradesh and Tamil Nadu. The Hazardous Wastes (Management and Handling) Rules 1989 under Environment Protection Act were brought out by MOEF and are applicable to 18 categories of wastes listed in the Schedules to these Rules.

18. It is ironical that hospitals, nursing homes and clinics which provide succour to the ailing also create health hazards through indiscriminate disposal of bio-medical wastes. These include a variety of wastes such as hypodermic needles, scalpel blades, surgical gloves, cotton, bandages, clothes, medicines, blood and body fluid, human tissues and organs, body parts, radio-active substances and chemicals. Some of these contain harmful organisms and disease-causing agents. For instance, a reuse of discarded syringes/needles can transmit lethal diseases like AIDS and hepatitis. Similarly, incineration of wastes, particularly chlorinated organic compounds, can result in noxious emissions, including the dreaded dioxin.

19. A draft of the Municipal Solid Waste (Management and Handling) Rules has been issued and a Steering Committee has been constituted to oversee implementation of the Biomedical Wastes (Management and Handling) Rules which were finalized in 1998. However, at present there is very little infrastructure available for proper disposal of these

wastes, except for a few individual facilities in large chemical complexes.

20. Although 18 states have been provided financial assistance for management of hazardous wastes, the progress in identification of sites for safe disposal of hazardous wastes is poor. As reported by SPCBs, about 76 hazardous waste disposal sites have been identified, out of which only 12 have been notified by the States/Union Territories. As a result, large scale leaching from dumps of hazardous wastes continues to contaminate soil and ground water resources. The Supreme Court has commented adversely on the steps taken by SPCBs to monitor setting up of such facilities.

21. New approaches to this problem need to be considered. Non-profit entities with complete autonomy but independent regulatory control in partnership with SPCBs and financial institutions need to be encouraged. These could levy an appropriate user charge.

Biodiversity

22. India is endowed with unique bio-diversity. It is one of 12 mega bio diversity countries of the world and harbors in excess of recorded 46,000 plant species and 81,000 animal species. About 20 species of higher plants are categorized as “possibly extinct” as they have not been sighted during the last 6-10 decades. Indian Cheetah, lesser Rhino, the Pink – headed duck, the Forest outlet and the Himalayan mountain quail are reported to have become extinct. About 39 species of mammals, 72 birds, 17 reptiles, 3 amphibians, 2 fish and a large number of butterflies, moths and beetles, besides 1336 plant species, are considered vulnerable and endangered. Habitat loss, unsustainable legal and illegal harvesting, exotics, imbalance in community structure and floods, drought and cyclones are main threats to bio-diversity.

23. Current in-situ and ex-situ conservation efforts are based on a combination of holistic eco-system-based schemes and those specifically focused on apex key species. Some of these are in the form of programmes such as Bio-sphere Reserves, Tiger Reserves, National Parks and sanctuaries, Wetlands, Mangroves, Coral reefs, Deserts and Mountains.

24. Since the conservation of an entire range of species is neither practical nor possible, survey organizations may identify the keystone and umbrella species. Conserving such species ensures protection of all related species as well. Similarly, there is a need to develop models/packages for the conservation of endemic species. The process of preparation of red data books on endangered species of flora and fauna needs to be speeded up and validated using the internationally recognized revised guidelines.

Forests and Wildlife

Role of forests

25. Indian forests, though not very rich with a low productivity of 0.7 tonnes per ha per year (this contrasts with the FSI estimate that most Indian forests are capable of productivity of at least 2 cum per ha per year), are important for several reasons.

26. First for the environmental functions that they perform, such as watershed protection, prevention of soil and water run-off and groundwater recharge. Studies of different tropical forest and tree crop systems have shown that it is the understorey of grass, shrubs and leaf litter, rather than the trees themselves, which is the key element in reducing most soil erosion and surface runoff. Thus, for a given level of land management, natural forests provide the highest level of soil and moisture conservation services. This has been rightly recognized in India and the Forest Conservation Act passed in 1988 has banned commercialisation of forests.

27. Second, they are a source of sustenance to 100 million forest dwellers, more than half of them tribals, as they provide non-timber forest products (NTFPs), small timber, fuel-wood and fodder.

28. Third, most forests are located in dry and poor regions of low agricultural productivity. Hence, the potential for poverty alleviation through forestry is immense, through both livelihood products and through forest functions of stabilizing moisture regime for agriculture.

Area of dense forest cover in India (m ha)	
Year	Dense forest cover
1972-75	46.42
1980-82	36.14
1985-87	37.85
1987-89	38.50
1989-91	38.56
1991-93	38.58
1995-97	36.73

29. And last, a large number of programmes in watershed development, drinking water, agriculture, irrigation and dairy will have sustained benefits only when barren lands are put under green cover through afforestation. A single Rupee spent on forests will not only improve productivity of forests, but would enhance returns in many related sectors.

Changes in Forest Cover

30. Whereas policies in India up to 1988 emphasized the use of forests for industry and urban users, the policy since then gives primacy to environmental functions of forests and satisfying the subsistence needs of forest dwellers. Thus, the forest policy today is seen to perform an important poverty alleviation function, and forest operations are often funded from budgets meant for rural development.

31. Thanks to these policy changes the area of dense forests has now stabilised, though the country lost 1.3 m ha of dense forests (with crown cover of more than 40%) every year for the years 1972-75 and 1980-82. The pressure on forests is also reduced by liberalized wood imports (touching 1.3 billion US \$ in 1997-98), ban on felling of green trees, natural spread of *Prosopis juliflora* shrubs (an excellent coppicer with high calorific value with sale of its twigs emerging as a cottage industry for the poor, especially for women and children) and by the success of farm forestry. Finally, agriculture intensification through irrigation and use of fertilisers and reduction in poverty may have saved forests from being

diverted for food production.

Outlay for Forests

32. Forests are managed by states primarily with state funds supported by external donors. For the forestry sector, during the Eighth Plan (1992-97) the state plan outlay was Rs.3,550 crores, whereas funds received from the Ministry of E & F as centrally sponsored scheme were only about Rs.500 crores, or less than 20% of the total. This would be even less than 15% if one took into account the transfer of funds from District Rural Development Agencies (DRDA) to district field agencies for forestry related work. For the Ninth Plan the State Plan outlay is Rs 6,300 crores, whereas the contribution of centrally sponsored schemes would not be more than Rs.1,500 crores. Most externally aided projects in the forestry sector are negotiated with the states and external aid is reflected in the state budgets.

33. Investment in forestry in India is likely to decline sharply in the next two years, however, because of a ban imposed by countries like Japan and Denmark on assistance to India. Rough estimates indicate that annual external funding in the forestry sector will decline from the present level of Rs.844 crores to just Rs.300 crores by 2002-03 unless special efforts are taken to start new projects. There is likely to be a decline in assistance from the World Bank too as no new projects have been signed after UP (1997) and Kerala (1998), nor are there any in the pipeline.

34. External assistance is not without strings. DFID spends far too much on documentation. According to its own report (August 1999) DFID produced 160 consultancy reports for a small Himachal Pradesh project of Rs 40 crores in two districts. Many of these reports have never been read, let alone acted upon by Forest Department (FD) staff. It caused tremendous burden to the local staff. The gainers were the British Universities. One hopes that the MOEF as well as the Department of Environment (DOE) would closely monitor such inputs from consultants. Government of India (GOI) also does not have a strategy for prioritising the needs in the sector and then coordinating between donors. MOEF has only ensured that funds from the two largest donors do not go to the same state. There is need to improve the capability of the Ministry to monitor and guide the implementation of all forest related activities.

Joint Forest Management (JFM)

35. By 1997, eighteen state governments have issued enabling resolutions permitting partnerships with local people. These states have 80 percent of the country's forest land and 92 percent of its tribal population. The JFM programme has now become the central point of future forest development projects funded by the Government of India and the donor agencies. According to government data, it is estimated that 36,130 village committees are protecting about 10.2 million ha of forests (though both quality of protection and its sustainability need improvement). The area comprises 17% of the forest cover in India. With more imaginative policies and innovative silviculture, this area could be increased to 15 million ha in about a decade to cover about a quarter of the total forest cover.

Table 2: State wise Coverage Under JFM (Area in Sq. Kms.)

State	No. of committees	Total Forest Cover	Area under JFM	JFM area as % of total forest sector
Andhra Pradesh	6575	43290	16322	37.70
Arunachal Pradesh	10	68602	53	0.08
Assam	101	23824	31	0.13
Bihar	1675	26524	9350	35.25
Gujarat	706	12578	910	7.23
Haryana	350	604	607	100.50
Himachal Pradesh	203	12521	620	4.95
J & K	1599	20440	793	3.88
Karnataka	1212	32403	128	0.40
Kerala	21	10334	40	0.39
Madhya Pradesh	12038	131195	58000	44.21
Maharashtra	502	46143	947	2.05
Mizoram	103	18775	58	0.31
Nagaland	55	14221	6	0.04
Orissa	3704	46941	4193	8.93
Punjab	89	1387	390	28.12
Rajasthan	2705	13353	2356	17.64
Sikkim	98	3129	22	0.70
Tamil Nadu	599	17064	2244	13.15
Tripura	157	5546	162	2.92
Uttar Pradesh	197	33994	345	1.01
West Bengal	3431	8349	4906	58.76
Total	36130	591217	102483	17.33

36. The Guidelines for implementing JFM were revised by GOI in Feb. 2000. The important new suggestions are:

- Register JFM societies under Societies Registration Act,
- Increase participation of women,
- Permit JFM in good forest areas,
- Recognise self-initiated groups, and
- Prepare micro-plans after Participatory Rural Appraisal (PRA) exercise.

However, several problems still remain. These are discussed below.

37. **Rights of Non-protecting People** - The legal framework for joint management remains weak and controversial. First, the old rights and privileges of the people (usually established in the colonial period) have continued in most degraded forests, and often such rights include free access to expensive timber. Privileges without corresponding responsibility are counter-productive. Second, often more than one village have their rights in the same forest, with the result that it becomes difficult to promote village protection committees. Third, a large number of new settlers in a village (they may be the poorest) have no traditional rights in forests as their ancestors did not live in the village at the time of forest settlement. They get deprived of benefits and are compelled to obtain these illegally. Fourth, sometimes people living several kilometres away from the forest have customary rights in forests. With no possibility of getting involved in forest management, they have been customarily using these lands as an open-access resource without any restriction for grazing and collection of fuelwood and NTFPs. Often forest officials, while recognising the VFC (village forest committee) formed in a village with respect to a particular forest tract, give permission for collection of firewood from the same forest area to right holders from other villages who do not contribute to protection. Migratory tribes from other states too send their cattle for grazing, and their rights have been upheld by the Supreme Court.

38. Thus, a forest patch does not have a well-defined and recognised user-group and may admit the rights of an entire population of that region or of the entire forest area. This type of 'right-regime' which makes forests open-access lands is not conducive to successful protection as rights of contiguous villages protecting forests may come in conflict with those of distant villages not protecting them but still having rights to enjoy usufruct.

39. Therefore, at least in JFM areas, use rights should be reviewed in order to put them in harmony with '*care and share philosophy*' which is the basis of JFM. Even in unclassified forests where no previous settlement has been done, the task is not simple due to the practice of use by a large class of stakeholders. Elsewhere, old settlement rights may have to be modified to make these amenable to formation of viable VFCs. This is easier said than done as changing customary or legal rights would be perceived as an unpopular step and may face political hurdles. Such a policy can be made acceptable if it is accompanied by other pro-people changes in technology, nature of species, secure rights over produce, etc.

40. **Inter-village Disputes** - Most VFCs want their forest tract boundaries to be formally demarcated. Rough agreements between villages over these boundaries may be sufficient when the resource is degraded, but once valuable products are regenerated conflicts will ensue in the absence of formal notification. Often forest maps are not available which delays formalisation of boundaries. This is not a simple exercise since natural, administrative and customary boundaries do not coincide. In practice, under existing customary use, different boundaries apply to different products, e.g. grazing and fuelwood. Boundary disputes between neighbouring VFCs are likely to increase as harvesting approaches.

41. **VFCs and Panchayats** - Another legal concern is the status of VFCs versus the Village Panchayats which may cover a larger area than controlled by VFCs. State Government resolutions recommend VFCs as functional groups. However, these committees

have no legal and statutory basis and it may be difficult for them to manage resources on a long term basis. The links between panchayats and JFM groups are fairly weak, specially in AP and MP. At the moment the JFM in AP and MP is working well because the programme is flush with funds. Whether or not this is sustainable, however, remains an open question. The Orissa order prescribes that the lady Deputy Chief of the local panchayat will be the head of the VFC but the panchayats are not working well and her stewardship is not seen as legitimate by the indigenous VFCs.

42. Unlike panchayats, powers to the VFC are not given under any law, which may affect its right to check free-riding in the longer run. Thus, most successful VFCs charge fees for collection of forest produce, although this practice is technically against the Forest Act. The illegality can be removed if the allotment of forest land to VFCs is done under section 28 of the Forest Act. At present it is done administratively. Often in the same region, such as UP hills, the World Bank has promoted different committees, one for forests, a second for drinking water, and a third for education, and these may be all distinct from panchayats!

Marketing of NTFPs

43. As the commercial importance of non-timber forest products increased in the past, the state governments nationalised during the 1960's and 70's almost all important NTFPs. This has meant that these can be sold only to government agencies or to agencies so nominated by the government. In theory, this right was acquired ostensibly to protect the interest of the poor against exploitation by private traders and middlemen. In practice, such rights were sublet to private traders and industry. Thus, a hierarchy of objectives developed: industry and other large end-users had the first charge on the product at low and subsidised rates; revenue was maximised subject to the first objective which implied that there was no consistent policy to encourage value addition at lower levels; and tribal and the interest of the poor was relegated to the last level or completely ignored. Old restrictions imposed in the past on NTFP processing and sale are still in place. The poor have no right to process these items and sell them freely in the market.

44. Practical considerations would show that government is incapable effectively to administer complete control and do buying and selling of NTFPs itself. It is better for government to facilitate private trade and to act as a watchdog rather than try to eliminate it. Monopoly purchase by government requires sustained political support and excellent bureaucratic machinery. It is difficult to ensure these over a long period and hence nationalisation has often increased exploitation of the poor. Experience shows that open markets may give producers the best chance of gaining a competitive price for their products. For marketing NTFPs, government should not have a monopoly nor create such a monopoly for traders and mills. The solution is to denationalise NTFPs gradually so as to encourage healthy competition. Government should set up promotional Marketing Boards, as distinct from commercial corporations (which are inefficient and hence demand nationalisation), with responsibility for dissemination of information about markets and prices to the gatherers. The Boards would help in bridging the gap between what consumers pay and what gatherers get. Free purchase by all and sundry would also be in tune with current liberalisation and open market climate. Encouraging setting up of processing units within tribal areas is also to be recommended.

45. **NTFP Issues in Schedule V states** - Doing away with government monopoly is urgent also because GOI has passed a new legislation for Tribal areas (called Schedule V areas) of Central India according to which Gram Sabha/ Panchayat, and not government, is the owner of NTFPs. Although this law has been on the statute since December 1996, unfortunately its implications for tribal incomes or the sustainability of JFM has not been fully understood by the states and they have not passed laws to honour the commitment of the Constitution. The Ministry of E & F wrote to all state governments in July, 1998 against monopolies and in favour of open market purchases, but unfortunately it did not pursue the compliance of its own orders, with the result that no change took place despite a strong Central law and the letter from Secretary, MOEF.

Kendu Leaf (KL) Collection in Orissa

- 15 lakh poorest people - mostly women get 10% to 40% of their annual income from KL
- As compared to AP and MP, Orissa leaves are of a better quality, yet pluckers get lower wages
- Orissa govt gets Rs.150 crores as royalty - for every rupee paid to plucker royalty is 3 rupees
- On Bauxite, the royalty is Rs 30 per tonne; on KL Rs.12,000 per tonne
- Unlike MP, no sharing of royalty with pluckers as bonus, no group insurance scheme
- Often payment is delayed by 3 to 4 months forcing the pluckers to mortgage their cards
- **Suggestions**
- Share 50% royalty with pluckers - it will give additional Income of Rs.1,000 to Rs.1,500 annually to households
- The rest 50% royalty should go to panchayats
- Promote Self-Help Groups, introduce Group Insurance
- Ensure prompt payment

46. **New Initiative on Bamboo, 1999** - Cane, bamboo and basket weavers total more than a million. For them, the procedure of obtaining bamboo from forests is complicated, especially for artisans located outside the district. The procedure can be completed only through involvement of contractors and agents in the whole process, which makes sale in the black market a good possibility. Although there has been liberalisation of procedure for farm forestry, no such initiative has been taken so far for bamboo workers, with the result that both production of bamboo on private farms as well as access of artisans to bamboo has suffered. A new scheme has been launched by the Prime Minister on the World Environment Day to augment bamboo resources in the country. The scheme can generate up to 50 lakh mandays in rural employment. However, for the scheme to succeed, the State Governments will have to make modifications in many rules and regulations governing bamboo.

47. The artisans require young and green bamboo, which is not produced by the FD; in fact the present silvicultural practices ban felling of green bamboo. Traditionally the department's bamboo harvesting policy systematically maximizes dry bamboo output for paper mills rather than green bamboo output for artisans. In fact, if bamboo forests are carefully worked and green bamboos regularly harvested, bamboo output of an average clump would jump. Artisans who are living close to forests can be involved in management

of bamboo forests so that they extract bamboo themselves without damaging the clump.

48. **JFM & Poor** - JFM has often failed to give fair attention to the poorest forest dependent communities such as artisans, headloaders and podu (shifting) cultivators. Although FD does not evict podu cultivators, it includes old podu lands within the scope of JFM. This increases fears of the tribals that after wage earning programmes are withdrawn their food security would be jeopardised.

JFM & Poor

In forest villages, the poor are supposed to protect the natural resources. But have they developed a sense of ownership about those resources?

A chief Minister sought to find this out when he went to a JFM village in his state recently. There, the CM pointedly asked a tribal why he was participating in the programme.

The reply was just as direct. "I get here Rs.65 as wages," the tribal said. "Elsewhere, I will get only about two-thirds that money."

CM asked again: "Who owns these trees?"

"Forest Department," replied the tribal. He had no clue what long-term benefit, if any, he would get from protecting those trees.

Elsewhere, as the CM met several thousand women, he tried to check out if they got as much wages as men got. "Those of you who fail to get same wages, put up your hand," he urged his audience.

Almost all the women raised their hands as government officials looked embarrassingly on. The officials had earlier told the CM that the women workers were being paid equal wages in all government programmes.

49. **Links with Watershed Development** - One of the least understood but a most useful concept is the complementarity between forests and agriculture. If it is strengthened, the local community develops a stake in the preservation of forests which can deter individual attempts at encroachments or degradation. Traditional agro-forestry patterns are a reflection of farmers' own perception of complementarity between trees and crops, but the issue is wider than one between trees and crops. To enrich this complementarity, one of the main objectives of forest management should be preservation of soil and moisture in a demonstrative fashion.

50. Soil and water conservation measures such as contour trenching, vegetative bunding and small check-dams can enhance soil moisture and accumulation of top soil, accelerating the rehabilitation of micro-environment. This by itself helps in regeneration and better survival of plants. However, the fund allocation in forestry projects for soil conservation measures do not appear to be adequate. The Ministry of Rural Areas and Employment recently permitted its funds to be used in watershed schemes by the FD, but a similar initiative is needed from the Ministry of Agriculture too.

Other Policy Issues

51. There are several other areas where action by government is needed. Here are some

of them:

- Verifiable indicators to measure the progress of poverty alleviation, tribal welfare and women's empowerment do not exist; these have been neither stressed nor monitored and, therefore, not achieved. Benefits to the poor beyond wages are limited.
- Integrated land use planning is not being attempted and common lands adjacent to forests get a low priority in projects after 1991.
- Focus on farm forestry has been surprisingly diluted since 1991 despite its enormous potential, especially in agriculturally backward areas. There are better social returns in promoting agro forestry models in rainfed or semi-arid regions which make up most of India's marginal lands. It is in this region the JFM Projects need to take a big initiative. Similarly, tree plantation on marginal and wastelands belonging to the poor is not encouraged in forest projects.
- Growing of short rotation crops on forests still continues, thus reducing the size of the market available to farmers. Unfortunately, both AP and UP projects are funding eucalyptus plantations on government forests. Since the demand for marketed wood in India is limited, duplicating species like eucalyptus on forest lands as on farm lands ultimately cuts into the profits of farmers and, thus, undermines the farm forestry programme itself.
- Continuing subsidies on government supply of wood and bamboo to industries act as a disincentive to industry to pay remunerative price to farmers. Governments need to examine the pattern of subsidy to forest based industries and wipe out that subsidy in a time-bound manner so as to improve valuation of forests. This will also give a big boost to farm forestry.
- In the current import policy, government must review its decision to allow cheap and duty free import of pulp. While free import of timber may continue, as it reduces pressure on forests, such facility for pulp hits farmers as both eucalyptus and bamboo are short gestation crops eminently suitable for the farm sector.
- Funds meant for the forestry sector are often diverted to other areas, especially to pay salaries. MOEF should examine setting up Forest Development Agencies at the field level to ensure timely availability of funds for this sector.
- There is poor understanding of the social implication of technology. FD should consider changing forest technology by shifting attention from timber to floor management and production of more gatherable biomass.

52. **Multiplicity of Schemes** - Out of the three schemes run by the National Afforestation and Eco Development Board (NAEB), two are similar in nature and must be merged. The Ministry should also consider running the merged scheme only in those states which do not have an externally funded project or which has just completed such a project. Running the scheme in all the states means dilution of efforts; on the other hand, confining it only to a few states will help in ensuring stabilisation of the efforts made earlier in the projects.

Forestry Research Education & Training :

53. The prime institution responsible to undertake, aid, promote and co-ordinate forestry research, education and training in the country is the Indian Council of Forestry Research and

Education (ICFRE) Eight institutes and three advanced centres of the Council cater to research needs of the different eco-climatic zones.

54. Research and technology development does not form part of an integrated strategy for development of forestry. There has been good research in some states by ICFRE but it is spotty and variable. The states have endeavoured to do their own work in research. Though there is nothing wrong with this, the state efforts could have been made more effective and productive through better linkages with other state level as well as national and international organisations. Another shortcoming is that research is not currently driven by problems encountered in the field. Other problems are:

- Current projects give less than adequate attention to research in NTFPs production and processing which should ideally be high on the state research agenda.
- Dissemination of research through field level functionaries does not receive adequate attention.
- Development of new technologies for rainfed areas does not find adequate part in the research agenda.
- Improvement in seed quality, seed & seed sources and seed handling, nursery improvement, plant propagation, silvicultural management and fire protection should be the central points of research agenda.

55. The incentive framework is not geared towards high quality research. In forestry, important research positions in research institutes are occupied by officers of the Indian Forest Service (IFS) who are frequently transferred and hence are not able to keep up with the rapid advances in science. This could also be a major reason why forestry research has lagged behind agricultural research in India. Agricultural research is not run by administrators. At the same time one should add that the quality of papers produced by non-foresters in Forest Research Institutes is quite poor when compared to International standards. Unfortunately there is no simple solution to reforming this basic problem on the research front.

56. The World Bank-assisted Forestry Research, Education and Extension (FREE) project is being implemented by ICFRE. The implementation experience of the project has not been easy. It was classified as a problem project by the mid-term review mission of the World Bank because of poor project achievements, poor disbursement, procurement delays, staffing, constraints and failure to comply with critical legal covenants. In addition, implementation of the eco-development component of the project has run into problems.

An evaluation study done by Winrock International Institute has pointed out that a proper mechanism is required to establish strategic missions, identify programme focus and set research priorities. Effective coordination is lacking and there are overlaps and duplication in various projects being undertaken by different Institutes. It brings out the isolation of scientists working in those Institutes from other institutes in the country as well as international Institutes. The report has emphasized deployment of research personnel in projects suited to their area of expertise and experience, more focused training of the staff as also the need for research on issues like national forest eco-systems, forest hydrology and

social sciences.

Wildlife

57. From 10 National Parks and 127 sanctuaries occupying some 2.5 million ha in 1970, the total coverage in 1996-97 went up to 83 National Parks and 447 sanctuaries over 15 million ha. On the whole the status of these Protected Areas (PAs) is somewhat unsatisfactory vis-à-vis biodiversity conservation. Only 40% of National Parks and 16% of Wildlife Sanctuaries have completed their legal procedures. These are under intense pressure from human population living within them (> 55%) and around them (< 80%); from traditional rights and leases in these areas (40%); from traditional grazing by livestock (> 40%), fodder extraction (>15%), timber extraction (>16%); and non-timber forest products (NTFP) extraction (>35%). In addition a significant number of them are used by government agencies (> 55%) for public thoroughfares (> 45%) and plantations (> 45%). Protected areas also experience illegal occupation and use (> 8%), encroachment (> 7%) and poaching (> 55%). In terms of PA management some have plans (> 30%) with zoning (>20%) and some have populations that need relocation (> 5%). As is quite apparent from the current scenario, PA management strategies need to be upgraded so that protected areas may function efficiently as systems for conservation of biodiversity.

58. **Confusion about strategy** - Eco-Development Projects (EDP) have two main thrust areas: improvement in PA management and involvement of local people. The strategy is to conserve biodiversity by addressing both the impact of local people on PA and the impact of PA on the local people. Implementation of the EDP has not been smooth because welfare activities undertaken by the project authorities are not reducing people's pressure on forests.

59. Eco-development is different from social forestry in old projects in one respect; that is, it is a non-forestry Programme implemented in villages close to forests, whereas social forestry was plantation of trees generally in areas remote from forests. However, the two share a common assumption: if resources outside forests become more productive, people will give up gathering from forests.

60. It is based on the belief that if projects support village development in the broadest way - cattle, veterinary inputs, schools, health, water, roads, etc. then people will appreciate role of the forest and help in its protection. Empirical evidence linking prosperity with reduction in gathering is not very conclusive. By itself, poverty alleviation does not reduce dependence on open resources unless people develop a sense of ownership about PAs. Only when people are given greater security of access to forest products and a sense of partnership in forest management will they develop a sense of ownership and have a greater motivation to ensure that the forest resource is not degraded. Thus JFM and EDP must go hand in hand in a complementary sense; in isolation, EDP would not be effective.

61. In the Andhra Pradesh project, an understanding of the concept of eco-development appears to be unclear as noted in the MTR (Jan-Feb 1997): "In particular it is necessary to ensure that there is a clear understanding of the concept and objectives of eco development among all staff, participating NGOs and EDCs to avoid the danger of eco development

becoming a more rural development type Programme, without the direct linkage to improved PA protection and reduction of dependency on PA resources that constitute its central rationale. The Mission noted that in some cases, eco development investments were not focused on addressing the actual pressures on the PA; rather it was being directed to achieving social welfare of the local communities.”

62. **Other Problems** - In addition there are problems of financial procedure and adequacy of staff. Spending as an indicator in all states shows dismal progress. In the World Bank project, in the last three years less than Rs.25 crores has been spent on the project against a target of Rs.150 crores. During the period 1999 - 2000 an amount of Rs.100 crores was to be spent on the project, but the expected real spending is only a quarter of the amount. Government of Rajasthan has not released any money for the eco-development project this year; so has Government of Bihar for the past two years. The project is scheduled to be completed by September 2001. Expectations from this project seem to be low. Many feel that only 10% of the objectives would be achieved by then.

63. Although the main premise of the project is to involve local communities in management, at the village level people have not understood the project objectives at all. It is estimated that only 10% would have any rudimentary understanding of what the project is about.

64. Even though there are components in the project where coordination with the Department of Rural Development is required, no complementarity exists between the two departments. West Bengal is the only state that is approaching the project through its Village Panchayats.

65. Forest offices in reserved areas also are usually short of staff; even the sanctioned posts are not filled. For example, the forest offices in the Corbett National Park and at the Kaziranga National Park are 20% short of the staff sanctioned for them. Therefore, even when the funds are available, the forest department cannot spend it.

66. The ecodevelopment project has a component of voluntary relocation of the local communities. However, in reserved areas like Buxa and Palamau, there is no space to relocate these people. In the case of Buxa, during pre-independence times the Forest Department had settled villages within the forest to help in the harvesting; now, it wishes to relocate them. Along with the problem of no available space, the people who are now living within the reserved area will not be willing to move out.

Summing up

67. Subsidies which encourage inefficient resource allocation and sub-optimal use of finite natural resources should be phased out especially in water, energy, fertilizers etc. Personal automobiles are to be discouraged through fiscal policies. User charges based on Long Run Marginal Cost of resources are essential. Tradable Emission rights and markets for environmental resources need to be evolved. Incentives for clean process and green products

need to be introduced. Unless environment measures make good business sense and improve the bottom-line, in the long-run industry will continue to evade its corporate responsibility especially when the cost of penalty is lower than that of compliance and the enforcement system is weak. Focussed research in industrial economics is called for.

68. On the whole, performance in forestry in India has been satisfactory, but it has not been able to realise the full potential of this sector, particularly the poverty alleviation focus of the 1988 Indian Forest Policy.

69. India could have been on the verge of achieving a revolution in forestry, both in producing market oriented products on farms and in protecting forests for environmental benefits and for sustaining the livelihoods of the forest dwellers if only appropriate lessons from the experience of the last two decades were drawn by governments. We have failed to consolidate on both the spectacular success of farm forestry and the current happy phase of JFM by not making strategic policy shifts and undertaking long term planning.