

7.1 Strategies and Actions for Wild Biodiversity

7.1.1 Wild Biodiversity: Strategies and Actions for Enhancing Understanding and Information

Overall strategies

1. **Undertake comprehensive inventories, mapping, monitoring, and valuation of biodiversity**, including of ecosystems, species, and genes, with special emphasis on (a) threatened, endemic, and neglected biodiversity, (b) ecological/ecosystem benefits and benefits, (c) sustainable use levels, and (d) combining traditional knowledge generating tools and new ones like remote sensing and GIS;
2. **Create a multi-layered database and information regime**, including an Indian Biodiversity Information System (IBIS), linking local to national levels, and capable of conveniently being accessed by the public with adequate safeguards for traditional knowledge protection; and,
3. **Enhance knowledge of the links between cultural and biological diversity.**

7.1.1.1 Strategy: Consolidate, Increase and Update the Knowledge on Ecosystems and Taxa

Surveys and assessments are needed to upgrade knowledge and data on biodiversity in India. These need to cover at least the following aspects:

1. Inventory of biodiversity elements, including at ecosystem, species, and genetic levels.
2. Study and monitoring of the status of these elements.
3. Assessment of the current coverage of *in situ* and *ex situ* conservation, including official, community and private initiatives.
4. Study of the links between biodiversity and human uses, including cultural and linguistic diversity, impacts of resource uses, estimation of sustainability of uses, etc.
5. Systematic organisation of the existing and newly generated data, and creation of database and information systems that can service the public.

While the general actions relating to this are dealt with below, some specific aspects are also dealt with in other strategies, e.g. assessments of protected area coverage in *Strategy 7.1.2.1*, and of community conserved areas in *Strategy 7.1.2.2*. **It is therefore recommended that all these actions be taken up in a coordinated fashion, though not necessarily in a centralised manner since suggested responsibilities for each of these may be different.**

Actions

1. Undertake a Comprehensive Inventory and Status Survey of Taxonomic Groups

Undertake surveys in representative ecosystems,

- i. To inventorise taxonomic components of biodiversity, at species and genetic levels, within a statistical framework that contains acceptable sampling and estimation methods of species/genetic richness and population sizes (given the enormous difficulties and exorbitant costs of doing total biodiversity inventories);
- ii. To document the presence and status of these components, building a baseline for future monitoring;
- iii. To specially focus on (a) neglected taxonomic groups, including non-flowering or non-vascular plants (including bryophytes, fungi, ferns, lichens, and algae), amphibians, invertebrates, micro-organisms etc.; (b) endemic and threatened taxa; and (c) taxa used for special purposes by humans.

Justification: India is one of the twelve megadiversity countries in the world, but the documentation of its biodiversity is still far from complete. This is clear from the recent reports on numerous new species of plants and animals, especially from less-explored ecosystems like marine areas and rainforests. There is possibly no site of appreciable size in the country, where a total inventory of species is available. Without an adequate knowledge of the range of taxonomic diversity in the country, conservation action will remain piecemeal.

Suggested Responsibility: MoEF to lead (building on the All-India Co-ordinated Project on Taxonomy under



Biodiversity Conservation), in collaboration with Department of Ocean Development, and with key responsibilities being borne by existing national surveys and institutions, such as Botanical Survey of India, Zoological Survey of India, Fisheries Survey of India, the proposed Microbiological Survey of India, NBRI, ICFRE, NIO, Centre of Advanced Study in Marine Biology at Annamalai University, the networks of specialists set up by Zoo Outreach and other organisations, research departments in colleges and universities, and other research institutions and NGOs, along with local community groups and knowledgeable individuals.

Time Frame: Immediate initiation, and ongoing, with realistic targets set for every 2 year period, accompanied by regular evaluation of target achievement.

Steps:

- i. Collate all available taxonomic data generated by credible institutions. This also needs to be done in electronic format. Inventories of aquatic biodiversity that are known now exist mainly in hard copies. It is recommended that each taxon be inventoried electronically, each species assigned an accession number and the databases so generated be made available at websites and on CDs (building on a system of accession numbers already being developed, and CDs already generated, e.g. for some marine groups, at institutions like National Institute of Oceanography or Centre for Advanced Study in Marine Biology).
- ii. Consolidate and standardize information on taxonomic details such as nomenclature (both common and scientific names) and endemism for the biodiversity present in different ecosystems and protected areas, and evolve mechanisms for continual updating of the same. Build on the information and database developed through the Conservation Assessment & Management Plan (CAMP) workshops, by Zoo Outreach Organisation and others; also link to databases like the Electronic Catalogue of Known Faunal Species at the NDCL Pune Centre for Biodiversity Informatics (see Box 6.8), and to the Global Taxonomic Initiative.
- iii. Such collation should also include the taxonomic information developed and put together by communities, including in initiatives like Community or People's Biodiversity Registers.
- iv. Develop an all-India database on taxonomic expertise (including community-level taxonomists and para-taxonomists). Further training to develop such expertise could build upon the ongoing All-India Taxonomy project.
- v. Develop a network of taxonomic survey institutions at various levels. Given the range of India's biodiversity, all the taxonomic surveys cannot be carried out by a single agency. The surveys need to be decentralised, but with strong linkages between them. The network proposed would serve as this linkage, and also serve as a clearinghouse mechanism for information. The network could be an electronic one, hosted by a central agency that would keep track of the spatial and temporal coverage of the surveys. This needs to be linked to the Indian Biodiversity Information System being proposed under Section 7.1.1.2.
- vi. Establish a Microbiological Survey of India, with mandates similar to ZSI, BSI and FSI, and building on the CSIR network project on microbial culture collections.
- vii. Initiate thereafter complete inventorisation of a representative sample of ecosystems across the country, which should be carried out at two levels of intensity – an initial rapid survey to assess across taxa species richness, and a more detailed survey to ensure comprehensive documentation. This should also include genetic diversity within wild species. Subsequently this effort should be modified to fulfill a monitoring role.
- viii. The revised IUCN criteria should be used, through methods such as used in the CAMP exercises, to assess the conservation status of various species; the status reports should be published once in five years.



Relevant Ongoing GOI Schemes/Programmes:

- MOEF's project on Survey and Inventorization of Coastal and Marine Biodiversity, exploratory fishing activities of the Fisheries Survey of India; ICMAM and marine biodiversity inventory projects of DOD
- (i) Survey of Flora, (ii) Survey of Fauna, (iii) Forest Survey of India under Survey of Natural Resources, MoEF

2. Monitor the Status of Representative Ecosystems Across the Country

Initiate a continuous process of monitoring the state of various ecosystems in India, using clear criteria and methodologies, centrally involving community-based monitoring methods. This monitoring should involve:

- i. Assessment of the historical spread and status of representative ecosystems in India;

- ii. Assessment of the current spread and status of these ecosystems;
- iii. Creation of a comprehensive baseline database for further monitoring;
- iv. Setting up indicators and generating estimates and projections of the level of conservation or destruction of these ecosystems;
- v. Special focus on ecosystems so far neglected, including grasslands, deserts and wetlands, especially those in the mountain and hill systems of India; and on critically threatened ecosystem types such as drylands.

A broad programme on 'Ecosystems Survey of India' should be initiated for periodic mapping and monitoring of each ecosystem type. Ongoing monitoring initiatives, such as Forest Preservation Plots in several parts of the country, or vegetation monitoring by Indian Institute of Science, ATREE, etc., or monitoring by Forest Survey of India, should be built upon.

Justification: Conservation action in India today is based on piecemeal information on the status of ecosystems (and taxa), and there is almost no long-term (or even comprehensive short-term) monitoring that could establish precisely what is happening to these ecosystems. This is particularly true of the knowledge on the qualitative aspects of ecosystems, especially in terms of what is happening to the diversity of habitats, species and other taxa within these ecosystems.

Suggested Responsibility: MoEF as lead agency, in collaboration with national and state level institutions and departments including Ministry of Science and Technology, Department of Ocean Development, and others already mandated to do national surveys (ZSI, BSI, FSI, ICFRE, NIO, WII, IIRS/NRSA, etc.), NGOs, and community groups.

Time Frame: Immediate initiation, and ongoing, with periodic (every 5 years) assessments and evaluation.

Steps:

- i. Develop appropriate methods, including criteria and indicators, led by relevant national institutions including those working on community-based monitoring;
- ii. Choose an ecologically representative set of sample ecosystems across the country to start the monitoring, by first doing baseline surveys if not already available (including sites in protected areas, *see Box 7.1.1.1*; existing forest preservation plots of the Forest Department; and existing vegetation monitoring sites of various institutions and NGOs);
- iii. Develop a protocol for learning and dissemination of the findings from these initial sites;
- iv. Train local community and state-level institutions and agencies to carry out further monitoring, using a combination of methods including community knowledge as also modern computer- and satellite-based techniques;
- v. Set up electronic links between field monitoring sites and central repositories (*see Section 7.1.1.2*) to enable continuous updating; and,
- vi. Take up the remaining sites thereafter.

Relevant Ongoing GOI Schemes/Programmes:

- The Natural Resources Data Management System (NRDMS), Ministry of Science and Technology.
- The Landscape and Biodiversity Characterisation being carried out under the programme Bioprospecting and Molecular Taxonomy, Department of Biotechnology.
- The (i) Programmes of the Forest Survey of India, (ii) National Natural Resource Management System under Ministry of Environment and Forests.
- (i) Assessment of Marine Living Resources under Marine Living Resources Programme (ii) Programme on Coastal Habitats under Infrastructure, Training, R&D and Survey (iii) Surveys and inventorization of coastal and marine biodiversity; all under MoEF.

Under the proposed Ecosystems Survey of India programme, relevant institutions already working at a national level on grasslands (Indian Grasslands Research Institute), deserts (CAZRI), wetlands (SAC and SACON), coastal/marine areas (NIO), mountains (GBPIHED), and agricultural areas (ICAR) should be entrusted with moni-



toring and reporting on non-forest ecosystems, in the same manner that the Forest Survey of India does for forests. Appropriate infrastructure needs to be provided to these institutions for this purpose, and a common set of methods, which emphasise biodiversity as a central concern, needs to be developed. Socio-economic aspects also need to be built in.

This monitoring should also become part of the mandate and regular operational plan of various land and water management agencies, including *panchayati raj* institutions. This should be an ongoing programme with brief annual reporting and comprehensive periodic reporting at large intervals.

The reporting should include updated maps, apart from real-time conservation status reports on the ecosystems from all over the country. The results should feed into the preparation and updating of the Conservation Atlas of India (see Action 1 above).

3. Conduct Research on the Structure, Function, and Interactions Amongst and Within Ecosystems

Initiate short, medium, and long-term research on a range of ecological interactions, including:

- i. Plant-animal interactions (including pollinators) and ecosystem structure and functioning in all major ecosystems of the country, to enhance understanding of various ecological processes;

Box 7.1.1.1 Research and Monitoring in India's Protected Areas

(see Section 7.1.1.1, Action 3)

Research and monitoring efforts in India's PAs have been far from adequate. In a nationwide survey in the late 1980's, only 42% of the 38 surveyed national parks and 23% of the 166 surveyed sanctuaries reported that research work had been or was being undertaken, while 20% of the 46 national parks and 11% of the 193 sanctuaries reported monitoring activities (Kothari *et al.*, 1989). In the MoEF, where there is a window for research projects, out of the 13 projects related to wildlife, six are relevant to PAs. A meeting of the MoEF with the various wildlife research institutions in June 1993 revealed an inadequate coverage of rare and endangered species, and a rapidly changing scenario that required immediate attention. Most of the research on species is on large mammals and avifauna, and there is less work on smaller mammals, amphibians, reptiles and other small fauna, with practically no work on invertebrate conservation (except some on butterflies) (Rajamani Undated). Moreover, in the absence of well-defined criteria for classification of areas as national parks and sanctuaries, areas having highly endangered species continue as sanctuaries, while some areas, which are no more than zoos, are classified as national parks.

It has been stressed by concerned persons that the framework of wildlife research in PAs should be especially oriented to management and conservation of biodiversity, though basic research is also of value. Six key ecological areas identified for meeting the manager's requirement of drawing up a comprehensive management plan are (Rajamani Undated):

- **Inventory:** What plants, animals and other natural resources are present?
- **Quantification:** What numbers of each species are present and how are they distributed in space and time?
- **Ecological relationships:** Who eats what? Competes with what? What depends on what?
- **Species needs:** Habitat requirements, shelter, food, and mineral needs of species with special management significance.
- **Dynamics of change:** Colonisation of disturbed areas, serial succession of plant communities, change of river flow, evolution of swamps, invasion of new species and population trends within species.
- **Predictive manipulation of ecosystems:** Direct and indirect, short-term and long-term effects of different management options.

Based on the needs, a framework of priorities for research can be made out:

1. Long-term ecological studies in select or representative areas, including on various threats, fragmentation, species and genetic erosion, impacts of conservation, etc.
2. A greater and quicker understanding of endangered species, both flora and fauna.
3. Survey of biodiversity and state of resources like water and soil where data is lacking.

4. Integration of research on ethnic knowledge, how it can be protected, its value for communities and for modern conservation efforts, and its enhancement by combining it with formal knowledge systems.
5. Socio-economic studies to determine what the relationship of local communities is to natural ecosystems and species (including the sustainable practices of the local communities and areas where alternative means of livelihood are required).
6. Studies of what needs to be done to improve management practices in PAs.

For the above, there is a need to set up a research cell for every major PA or for a cluster of PA. This should comprise community and outside experts, from within and outside the government.

Source: Kutty and Kothari 2001.

- ii. The ecology and biology of those species for which information like habitat preferences, life history, reproductive modes, demography, population trends and behaviour are not available.

Justification: Understanding of the ecological interactions amongst and within ecosystems and amongst species, is even poorer than our understanding of the range of diversity in India. The ecology of even most threatened and endemic species is not properly studied. Research on plant-animal interactions is especially poor.

Suggested Responsibility: Jointly by community institutions, experts and research institutions (both governmental and non-governmental including ICFRE's centres, and State Forest Departments), university/college/ research departments involved with ecological research, and relevant NGOs.

Time Frame: Ongoing activity, given the vast scope of work.

Steps:

- i. Collate existing ecological research, and identify critical gaps;
- ii. Identify partner institutions (including communities, NGOs, and universities/colleges) for the research;
- iii. Initiate coordinated development of research programmes across the country, with periodic review of research programmes and priorities.

For all of the above actions to be implemented it is very vital that adequate capacity is built in terms of institutions and individuals. Certain areas like taxonomy and para-taxonomy need special attention and emphasis. Adequate funding support to set up various facilities, hire sufficient personnel and implement various actions must be ensured (see also Section 7.1.6).

Ongoing Relevant GOI Schemes/Programmes:

Several schemes funded by MoEF, DOD and DST, dealing with structure, function and interaction between and within ecosystems.

4. Study Ecosystem Benefits Provided by Biodiversity

Conduct research, to assess the precise nature and quantum of ecosystem benefits provided by different kinds of natural ecosystems and elements of biodiversity, including micro-organisms. For this, use available methods and develop new methods. *In particular*, focus on the **hydrological** benefits, stressing on the contribution of such ecosystems to the water security of downstream settlements including villages and cities, and the nation as a whole. Comparative assessments of intact and degraded ecosystems would be instructive. Build into such studies the local women and men's perceptions of ecosystem benefits. Such assessments should be built into the planning of each state and of the country, reflecting the true contribution of the ecosystems to the well-being of India's citizens. In so far as they can be realistically quantified, they should also be reflected in the state and national budgets.

Justification: Natural ecosystems and species provide a host of tangible and intangible services to human beings, including critical watershed and soil maintenance functions (see Section 4.2). However, the nature and quantum of these services are poorly understood, and are almost nowhere quantified for the purposes of economic planning. Given the short-term and long-term damage caused by ignoring such services, e.g. to water and health security of the country, it is critical to understand and evaluate them.

Suggested Responsibility: Academic and research institutions based in each region, such as Kumaon University for the Western Himalaya; NEHU for the north-east; KFRI, IISc, RANWA, ATREE, SACON for the Western Ghats; and WII and BNHS across various regions.

Time Frame: 5 years for key sites and services; ongoing for others.

Steps:

- i. Develop common methods for studying and evaluating ecosystem benefits, and conduct orientation sessions for key institutions across the country;
- ii. Choose a representative sample of key ecosystems and sites across the country, and conduct the research with a coordinated mechanism for exchanging research results, peer review, and collating nationwide information;
- iii. Choose a range of protected areas and community conserved areas (see Sections 7.1.2.1 and 7.1.2.2), and critically threatened ecosystems, such as mangroves and montane grasslands of southern India, within this representative sample;
- iv. Academic institutions and communities to work together to develop community-based assessment of ecosystem benefits (using the work done on community valuation of ecosystem values (e.g. Sanjay Kumar 2001));
- v. Develop on the work done in ongoing initiatives like the Millennium Ecosystem Assessment (www.millenniumassessment.org) work in India;
- vi. Ensure gender sensitivity and analysis in all of the above;
- vii. Suggest ways to integrate the results into conservation and developmental planning and budgeting at local, state and national levels (see also Section 7.1.9.2, Action 2).

By the 11th Five-Year Plan, a full range of ecosystem service values should be available to be integrated into the Plan.

5. Conduct Research on Links Between Natural and Domesticated Ecosystems and Taxa

(See Section 7.3)

6. Determine Sustainable Use Levels and Practices for Ecosystems and Taxa, Keeping in Mind Diverse Local Contexts

Conduct participatory and adaptive research involving local communities to assess the impacts of human uses of biological resources, and to determine locally appropriate sustainable use levels, taking community and outside scientific criteria of sustainability into account. Location-specific, participatory studies to be conducted on the impacts and sustainable use limits and practices of the following, in specific ecological contexts:

- i. Grazing (including trampling, seed dispersal and fertilization) and fodder collection, including through lopping;
- ii. Logging and fuelwood use;
- iii. Medicinal plant extraction;
- iv. Other non-timber forest produce extraction;
- v. Fisheries and other aquatic resource uses;
- vi. Prospecting for commercial uses;
- vii. Extraction for research and educational purposes;
- viii. Tourism and pilgrimage;
- ix. Raw material extraction by industries of various kinds;
- x. Livestock dung removal from forests and grasslands;
- xi. Human presence (effects on wild plants and animals); and;
- xii. Presence of other domestic animals like dogs.



One component of this should be the production of site-specific manuals for such research and assessment, in different languages, usable by field staff of line departments and by local NGOs and community members.

Also critical would be the documentation of past and ongoing community methods of ensuring sustainability, including those used by women, and their widespread dissemination for other communities and other parts of Indian society to learn from (*see, for instance, Section 6.1.4.2*).

Justification: Biological resources in India are subject to a host of uses, varying in level of use from light to heavy. Our understanding of the precise impact of these uses on the resources being used is limited. Even more limited is the understanding of the impacts that such uses have on the biodiversity elements dependent on these resources. The term 'sustainable use' is itself poorly understood and often misused. Research that combines the knowledge and techniques of the formal scientific sector with the scientific understanding, experience and intuition of local women and men is almost non-existent. It is impossible to ensure that resource uses are sustainable without clearer and more comprehensive understanding of this kind, and without an agreement amongst various sectors of the acceptable levels of use and the criteria for determining such levels. Such levels need not be fixed over time, but could be flexible, adjusted as per feedback based on regular monitoring.

Suggested Responsibility: Community-level organisations and individuals with local line agency staff, academic institutions, and NGOs, for site-specific standards; MoEF for a broad national framework and methodologies manual, with involvement of Ministry of Rural Development, Department of Ocean Development, Ministry of Science and Technology, Ministry of Tribal Affairs, and Department of Women and Child Development.

Time Frame: 5 years for initial representative set of ecosystems and human uses; ongoing for remaining.

Steps:

- i. Collate existing research results and methods for determining the impact of different resource uses in different ecosystems, and identify key gaps.
- ii. Evolve from these a set of standardised methods, including for participatory and gender-sensitive community-based assessment, for assessing sustainable use levels for different resource uses in each ecosystem.
- iii. Start with applying these to a representative sample of critical sites where resource uses are ongoing, including protected areas and community conserved areas; and a representative sample of resources being used, in particular highly traded/used, endemic and threatened species.
- iv. Over 5 years, assess the results, build further decentralised capacity to conduct such research, and then apply to other sites.

7. Enhance the Understanding and Use of Community Traditions, Knowledge, Practices and Livelihoods Related to Biodiversity, Amongst Other Sectors

(Link to *Strategies 7.1.1.2 (Action 3)*, *7.1.1.4 (Action 1)*, and *7.1.5.7*).

Increase participatory research and understanding of the range of gender-differentiated community traditions, knowledge, practices and livelihoods related to biodiversity, including of the following user groups:

- i. Forest-dwellers and forest resource users, including those practicing agriculture-forestry interface livelihoods and folk medicine (for both humans and livestock);
- ii. Coastal fisherfolk (including nomadic and migrant) and other dwellers utilising coastal and marine resources;
- iii. Inland fisherfolk and other wetland resource users (including nomadic and migrant);
- iv. Settled and nomadic pastoralists; and;
- v. Settled and nomadic artisans, including a range of non-pastoral nomadic groups.

This research should give special attention to recognizing the different knowledge, practices and roles of women and men. It should centrally involve community members, and where possible, facilitate research emanating from the communities themselves.



Relevant local community knowledge, skills and practices should be integrated into conservation research, planning and management, with the involvement and consent of these communities. While discrete traditional conservation models such as sacred groves or ponds are recognised, routine eco-friendly practices must also be recognised, such as rotating harvesting sites, leaving a minimum number of plants intact while harvesting, etc.

Justification: Through history, and continuing at many levels even today, communities in India have interacted with biodiversity through a complex set of traditions and practices; the livelihoods of hundreds of millions of people continue to be linked to these. Yet an in-depth understanding of these traditions and practices and the factors leading to their weakening or demise is lacking in most cases. Considerable insights on future ways of conservation and sustainable use can be gained from a greater understanding of these traditions and practices.

Respect for, and the use of, traditional practices is also a legally binding commitment by India under the Convention on Biological Diversity (Article 8j), and was recommended by the 9th Plan document: 'Local and traditional knowledge systems will have to be fully associated in the research programmes' (Report of the Working Group on Wildlife for the IX Plan (1997-2002), MoEF, May 1996, p.17). The Biological Diversity Act, 2002, also envisages local Biodiversity Management Committees empowered to chronicle, sustainably use and regulate the use of their biodiversity.

Suggested Responsibility: Respected and knowledgeable women and men of community-level institutions, including the proposed Biodiversity Management Committees to be set up under the Biological Diversity Act, and users' associations such as *Amchi* councils and women's self-help groups, on their own or in association with appropriate governmental and non-governmental institutions and movements like National Fishworkers Forum, people's science movements, etc; various government and academic agencies for integrating knowledge and practices into biodiversity and resource use planning, such as the Ministry of Rural Development, MoEF, Department of Ocean Development, Ministry of Science and Technology, Ministry of Tribal Affairs, Ministry of Social Justice and Empowerment, relevant state departments, Anthropological Survey of India and other regional or national research/survey institutes, and Wildlife Institute of India for PA Management guidelines.

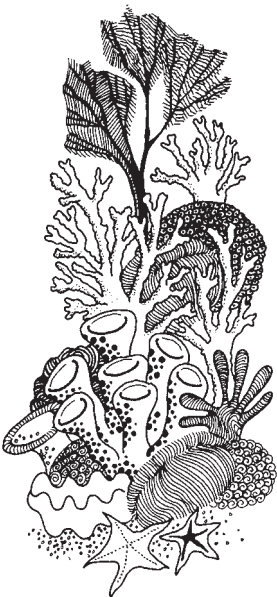
Time Frame: 5 years for an initial representative sample; ongoing for the remaining.

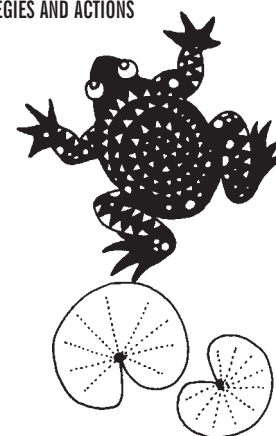
Steps:

- i. The Anthropological Survey of India as a lead agency, in collaboration with other relevant institutions and NGOs, including those skilled in gender analysis, to develop culturally- and gender-sensitive methods for such research.
- ii. Put together key available databases on this aspect, including national surveys like the All-India Ethnobiology project and the *People of India* Series, and identify key gaps.
- iii. Link these initiatives to the ongoing Community or People's Biodiversity Register work (see Sections 7.1.5.4 and 7.2.6.2).
- iv. Especially focus on neglected sectors like nomadic pastoralists and artisans, shifting cultivators, women farmers, Primitive Tribal Groups, and artisanal fisherfolk.
- v. Ensure that research results are available in local languages, and, when carried out by outside agencies, that these results are repatriated back to the communities, and that other safeguards are maintained to ensure protection of sensitive information (see Section 7.1.5.4).
- vi. Encourage community-level testing, validation, and innovative use of other communities, traditions and practices, through women's and other community sub-groups.

8. Initiate and Strengthen Research on Biodiversity Impacts of Climate Change

Strengthen ongoing research, to establish the possible impacts of climate change on India's biodiversity. This should include the following:





- i. Identification of vulnerable ecosystems and taxa, and their sensitivity, adaptive capacity, and susceptibility to climate change;
- ii. Impacts on ecosystems and taxa, directly by increases in temperatures and sea water levels, and indirectly by human population and socio-economic shifts (in particular, but not only on threatened or vulnerable ecosystems and taxa);
- iii. Impacts on biodiversity-based livelihoods, including the increase in risks and vulnerability that local communities will face;
- iv. Adaptation strategies, including the use of biodiversity itself, and of traditional coping strategies of communities responding to disasters and cyclical climate/physical changes.

Justification: Research on the impacts of climate change in India is in its infancy, and much of even what has been done has not focused on biodiversity. Given the imminent nature of global changes, and indications of the potentially catastrophic impacts these could have on natural ecosystems and species, and on coastal and agricultural land/water use systems, the urgency of research on this aspect cannot be over-emphasised.

Suggested Responsibility: Institutions like Indian Institute of Science (Centre for Ecological Sciences), Centre for Science and Environment, and Tata Energy Research Institute to lead, in collaboration with relevant government agencies and NGOs, building on an ongoing related MoEF/UNDP project.

Time Frame: 10 years to assess key impacts and coping strategies.

Steps:

- i. Identify strategies to plug key gaps in information that have already been identified, and provide funding and infrastructure support to scientific institutions to carry out the research.
- ii. Identify community institutions that would be able to help in understanding coping strategies.
- iii. Feed research results into strategies and actions (including state/national budgets) for mitigating impacts and taking preventive/ameliorative measures.

9. Integrate Monitoring and Evaluation into Ongoing Schemes, Projects, and Processes

Build in continuous, participatory, and gender- and equity-sensitive monitoring and evaluation (M&E) methods and procedures into all schemes, projects and processes, which have a bearing on biodiversity. These should include the following:

- i. Monitoring of impacts on biodiversity and biodiversity-based livelihoods;
- ii. Evaluation of the achievement of targets and objectives, in relation to biodiversity and biodiversity-based livelihoods; and;
- iii. Feedback mechanisms to influence the remaining course of the scheme, project, or process.

Justification: Government and NGO projects and processes have conventionally been weak on M&E, and even when this is done, it is often piecemeal and does not involve the affected populations. For any project/programme/scheme to be successful, it is important that M&E based on appropriate targets and indicators is an important component from the beginning. It is also important to make the plan flexible enough so that it can be appropriately adapted as a result of M&E. Further support to projects should be based on the achievements (or lack of them) that the M&E process brings to light. Various government, corporate and NGO programmes can enhance their efficacy by involving users in M&E. Indeed, it is especially important that the women and men of communities are involved in M&E, including through the use of their own indicators and methods. Participatory M&E can also be a powerful tool for the empowerment of local communities and underprivileged sections within them.

Suggested Responsibility: Development of Participatory M&E methods by appropriate research institutions, including WII, IIFM, ATREE, GBIHED, IBRAD, TISS, Centre for Women's Development Studies, ISEC, MIDS, etc., and their integration and implementation by all relevant government agencies at local to national levels, in collaboration with NGOs and community groups.

Time Frame: One year for development of methods, and ongoing thereafter.

Steps:

(See also *Box 7.1.1.2* on specific steps suggested in various BSAPs)

- i. M&E to become an integral part of all existing biodiversity-related schemes of the central and state government, to be mandatorily conducted by the implementing agencies; this could include the wildlife-related schemes of the Ministry of Environment and Forests, the extension and subsidy schemes of the Ministry of Agriculture, the fisheries schemes of the Fisheries Department, the livestock programmes of the Animal Husbandry Department, etc.
- ii. M&E to be required in all programmes and projects that have an impact on biodiversity, and integrated into relevant legislation including the Environment Protection Act (and its component EIA procedures and guidelines).
- iii. Develop ecologically and culturally sensitive methodologies, and a set of guidelines for the above, including a full set of criteria and indicators to assess performance. Such a set must include indigenous/local community criteria and indicators, along with formal/modern criteria and indicators. Monitoring mechanisms have to be in place before starting the process.
- iv. Develop a set of bio-indicators for different ecosystems, in particular to judge the success or otherwise of conservation measures by increase/decrease in wildlife diversity and numbers, and the presence/absence of sensitive species.
- v. Develop M&E training modules, and their incorporation into the curricula of relevant research and village-level institutions, including those dealing with natural resource-related training. Build the capacity of institutions and line departments to carry out participatory M&E. Develop site-specific M&E manuals in regional languages. The modules and manuals can be pilot tested at some representative sites, and then further revised if necessary for wider application.
- vi. Create specific institutional mechanisms for participatory M&E, or empower appropriate existing ones, as part of project planning. These could be housed in the proposed Biodiversity Management Committees at local levels, and State Biodiversity Boards at state levels.
- vii. Ensure adequate budgets for carrying out the above.

Box 7.1.1.2 Monitoring and Evaluation

(Recommendations in various BSAPs)

- *Haryana State BSAP* mentions the need for baseline surveys to initiate monitoring mechanisms, and stresses monitoring of fisheries.
- *Uttara Kannada Sub-state BSAP* has suggested the establishment of a Centre that would involve local people (through Village Forest Committees) and the use of local knowledge for monitoring particularly for marine biodiversity.
- *Rajasthan State BSAP* recommends a comprehensive programme for M&E, which includes broad indicators and a comprehensive set of guidelines; it also suggests a focus on protected areas and the desert ecosystem.
- *Manipur State BSAP* suggests that scientific methods and tools be identified for the rapid monitoring and identification of threats to biodiversity.
- *Madhya Pradesh, Pondicherry, Punjab, and Mizoram State BSAPs*, and the *Aravallis Ecoregional BSAP* recommend that monitoring systems should be set up; Madhya Pradesh particularly focuses on agro-ecosystems.
- *Uttaranchal State BSAP* suggests the establishment of one or more long-term monitoring plots in key habitats, in particular in protected areas and Forest Divisions.
- *Gujarat State BSAP* suggests M&E to be developed for wetlands.
- *Meghalaya State BSAP* suggests that local capacity must be strengthened for M&E to be carried out successfully.
- *Karnataka State BSAP* recommends capacity building of school and college teachers, government officials and folk ecologists for the purpose of participatory M&E. The *Deccan Andhra Sub-state BSAP* urges that women be involved in documenting agro-biodiversity, and using this as baseline data for M&E.
- *Kerala State BSAP* suggests that independent agencies at the local, national and international level should be involved to actively monitor threats and changes in ecosystems.
- *Kachchh Sub-state BSAP* recommends a Kachchh District Biodiversity Board (KDDB), which will have a technical expert group to monitor different programmes.
- *Western Ghats Ecoregional BSAP* suggests a Western Ghats Conservation Planning and Development Authority, which will also be responsible for M&E.
- *Central Forest Belt Ecoregional BSAP* suggests two separate bodies to look after M&E: The Central Forest Ecoregional Biodiversity Management and Regulatory Authority (CFEBMRA) and the Wetlands Biodiversity Authority.

10. Encourage the Widespread Use of Community Methods and Techniques for Information Generation

Identify, document and support traditional/indigenous and new methods employed by communities, for generating information, including informal observations and analysis in the process of using ecosystems and resources, informal and institutionalised group processes of exchanging and analysing information such as the Study Circles of Mendha (Lekha) (see Section 6.1.1.2), and participatory mapping. Build such methods into the training programmes of academic and research institutions and line departments.

Justification: Formal research programmes in India have so far almost exclusively focused on formal methods of information generation, and have ignored the powerful and often informal methods used by communities. Those used by village women are in particular ignored by the larger research system. Their encouragement, and linkages with the formal systems, would greatly strengthen the research efforts relating to biodiversity.

Suggested Responsibility: Institutions and organisations dealing with community-based research and learning (such as Indian Institute of Biosocial Research and Development, Indian Institute of Forest Management, People's Science Movement, Society for Participatory Research in Asia, Ashoka Trust for Ecology and Environment, Foundation for Ecological Security, G B Pant Institute of Himalayan Environment and Development, Centre for Ecological Sciences (at the IISc), Centre for Women's Development Studies, SNTD Women's University, TISS, Foundation for Revitalisation of Local Health Traditions, National Institute of Rural Development, local universities/colleges, etc.) and local community institutions such as Tarun Bharat Sangh, Nari Bikas Sangh, Ekta Parishad and Mazdoor Kisan Sangharsh Samiti, with inputs from the Ministry of Tribal Affairs, Ministry of Social Justice and Empowerment, University Grants Commission, Anthropological Survey of India, Indian Council of Social Science Research, public administration institutes, and other relevant central and state government institutions/departments.

Time Frame: Ongoing

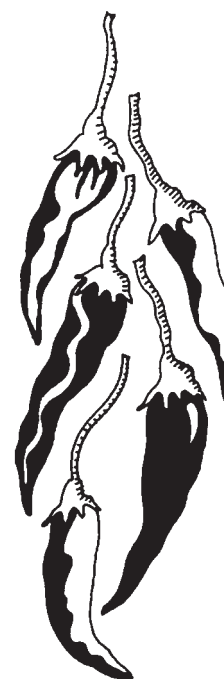
Steps:

- i. Anthropological Survey of India or other appropriate institution to collate available studies and information on community methods of information generation, and to identify key gaps in coverage;
- ii. Organise a series of workshops of key community institutions and networks, along with institutions and agencies such as those named above, to evolve common methodologies or techniques of enhancing understanding on the subject, and to identify key community and women's groups and individuals who could be resource persons for the next steps;
- iii. Develop guidelines, with central involvement of such resource persons, for encouraging the use of community learning methods through village institutions and women's associations/networks;
- iv. Issue guidance, from relevant ministries and institutions like University Grants Commission, for academic institutions to integrate community learning methods into their curricula and teaching practices;
- v. Widely disseminate these methods to formal sector information generation agencies, including through the development of multilingual database and information tools and best practice handbooks; and
- vi. Build a roster of women and men community experts who could guide academic institutions on the subject.

11. Spread the Use of New Information Generation Methods and Technologies and Dovetail These With Traditional Community Methods

Promote widespread public application of new information generation technologies, including remote sensing and GIS, and encourage the conjunctive use of these with community methods.

Justification: A host of new methodologies and technologies are available, including space and aerial imagery, but these are not in as widespread use as desirable; also, they are still out of reach of the majority of people, and are not fully dovetailed with the grassroots research of many formal institutions and of communities. Additionally, remote sensing technologies are of little use without 'ground truthing', which could be provided by community-based research methods. Such wider application and dovetailing will create powerful synergies in information generation.



Suggested Responsibility: Collaboratively between Indian Institute of Remote Sensing, Space Applications Centre, and National Remote Sensing Agency, building on the ongoing Natural Resources Data Management System (NRDMS); collaboration also with groups like ATREE, IISc, SACON, Foundation for Ecological Society, and others mentioned in *Action 1 in Strategy 7.1.1.1*, to provide the interface with NGOs and community institutions.

Time Frame: Ongoing; development of methods to integrate new and traditional methods/technologies within 2 years.

Steps:

- i. Identify key gaps in the use of new technologies and methods, building on the *Remote Sensing for Biodiversity Sub-thematic Review* and development of projects to fill these gaps;
- ii. Develop standards for the use of tools and techniques in creating geo-spatial databases;
- iii. Develop methodologies to synergise traditional and new community-based methods with the new formal sector methods and technologies;
- iv. Integrate such synergised methods into the training curricula of research institutions and line departments, and into orientation sessions for their personnel, as also for village level institutions;
- v. Provide special focus on participatory mapping and information registration methodologies;
- vi. Promote wider public access to new methods and technologies.

7.1.1.2 Strategy: Create and Maintain a Comprehensive, Multi-Layered Database and Information System

Actions

1. Create an Indian Biodiversity Information System (IBIS)

Create and maintain an Indian Biodiversity Information System (IBIS), layered at local, state and national levels. This should be built on existing databases and services like the Biodiversity Information System (BIS) of the Indian Institute of Remote Sensing, Environment Information System (ENVIS) of Ministry of Environment and Forests, BTISNET of Department of Biotechnology, NCL's National Centre on Biodiversity Informatics, National Innovations Foundation's database, WWF's Indira Gandhi Conservation Monitoring Centre database, etc. (see *Section 6.1.1.2 and Boxes 6.3 and 6.10*). Such a system should be:

- i. Interactive and multi-lingual, allowing for maximum possible public access (while keeping in mind the needs of protecting traditional knowledge, as per *Strategy 7.1.5.4*);
- ii. Geared to meeting the needs of decision-makers (including local communities), managers, educators, scientists, and so on;
- iii. Allowing further analysis and integration into other databases (inter-operability);
- iv. Capable of continuous updating; and
- v. Involving collaborative work amongst many institutions and organisations.

Justification: While considerable information and data on India's biodiversity exists at various levels, there is no networking and systematising of the scattered information. Official database and information systems as well as non-governmental ones, need to be linked up in a way that makes the information comparable and easily exchangeable. This will help to consolidate the information for policy making, conservation assessment, scientific analysis, EIA, and education, and also enable its dissemination. This system should be in the public domain so that easy access to all those interested is guaranteed; but with appropriate methods for protecting traditional knowledge and cultural heritage against piracy (see *Strategy 7.1.5.4*), sourcing all information to its origin as far as possible, registering it for legal and physical protection, devising penalties and measures to deal with violations, etc. This database system should integrate or make active on-line linkages to all other relevant databases that already exist, like the ones maintained by Forest Departments, research institutions like WII, and others.

Suggested Responsibility: MoEF to set up a collaborative partnership amongst relevant institutions, including all those currently maintaining key databases and information systems, including IIRS/NRSA, WWF-I, NIF, and others.



Time Frame: 5 years

Steps:

- i. Identify the key relevant institutions currently maintaining database and information systems, and community level initiatives, and the major gaps in these;
- ii. Provide ENVIS with a more autonomous status, and a corpus fund; link this to the BIS programme of IIRS, and form IBIS in an independent but government-linked organisation;
- iii. Create state-level database and information systems at appropriate nodal agencies, ideally the Planning or Environment Departments;
- iv. Put into place a system to link the local, state, and national nodal agencies, and an interactive, easily accessible electronic network amongst them;
- v. Undertake a series of training sessions for personnel of these national, regional, and local database repositories;
- vi. The database at various levels should be constantly updated, and detailed reports with analysis should be released once in three years.

Relevant Ongoing GOI Schemes/Programmes:

- Digital Inventorisation, Resource-Based Projects, National Bioresources Development Board
- Natural Resources Data Management System, Ministry of Science and Technology.
- National Natural Resource Management System, MoEF

2. Prepare a Biodiversity Conservation Atlas of India

Prepare an atlas containing maps of the following:

- i. various biogeographic, ecological and other regions, specific ecosystems of India, and vegetation types (using standardised definitions and methods);
- ii. locations of protected areas, other official conservation sites (biosphere reserves, Ramsar sites, heritage sites, ecologically sensitive areas, medicinal plant conservation areas, and others), sacred groves, other community conserved areas, and regional hotspots of biodiversity;
- iii. geographical ranges of threatened and endemic species;
- iv. locations of high agricultural biodiversity and cultural diversity (see also Section 7.2.2);
- v. locations of microbial gene pools;
- vi. locations of highly destructive human intrusion, including from development projects and processes such as mining, dams, industries, urban growth, infrastructure, agricultural expansion, etc.

The atlas could be a combination of maps at 1:50,000 to 1:250,000 scale, the former for on-ground use, and the latter for broader regional or national overviews.

Justification: There is at the moment no comprehensive mapping system and consolidated series of maps that could be used for conservation purposes. Several individual institutions are carrying out mapping of individual ecosystems and themes, but these need to be put together into a consolidated atlas.

Suggested Responsibility: MoEF as overall lead agency through IBIS, and mapping and collation jointly by governmental and non-governmental agencies with experience in working with spatial databases and GIS at a landscape level, including the National Remote Sensing Agency, Indian Institute of Remote Sensing, Space Applications Centre, Forest Survey of India, National Institute of Oceanography, Ministry of Rural Development, Ministry of Science and Technology, State Forest and Agricultural Departments, departments related to soil, water and mineral surveys, Botanical Survey of India, Zoological Survey of India, Fisheries Survey of India, University research departments, CSIR and its various laboratories/institutions, the National Bureaus of Plant, Animal, and Fish Genetic Resources, Indian Grassland Research Institute, National Botanical Research Institute, Indian Council for Forestry Research and Education, Central Arid Zone Research Institute, Wildlife Institute of India, Salim Ali Centre for Ornithology and Natural History, French Institute, Ashoka Trust for Environment and Ecology, Bombay Natural History Society, Foundation for Ecological Security and other NGOs, with ground-level truthing involving local community institutions.





Time Frame: 5 years, with updating every 5 years thereafter.

Steps:

MoEF should set up a process involving the above-mentioned institutions and groups, to develop a comprehensive methodology for this task. Since this will involve considerable fieldwork apart from use of remote sensing data and mapping, at least five years will be required for a dedicated team with all the facilities to accomplish this goal. The use of various information generation technologies, including community mapping, remote sensing, GIS and surveillance technologies should be optimised for this purpose (*see Strategy 7.1.1.4*). The use of mobile computing could help retrieve these maps in the field, for maximum use and constant updating.

Relevant Ongoing GOI Schemes/Programmes:

- i. All India Soil and Land Use Survey Schemes under Natural Resource Management
- ii. Technology Development Extension and Training (TDET) under Other Schemes of Wasteland Development, Ministry of Rural Development.
- iii. Scientific Surveys and Services through Survey of India and National Atlas and Thematic Mapping Organisation, Ministry of Science and Technology.

3. Digitise and Photograph All Existing Specimens in Herbaria, Museums, and Other Collections

Provide all existing specimens in various collections (including herbaria, museums, and so on within and outside the government) with electronic and visual identities, and pool the resulting digital and photographic database into IBIS.

Justification: Scattered across India in public and private sector repositories is a vast collection of plant and animal specimens and micro-organisms (e.g. 60 BSI-related herbaria alone hold 3.6 million specimens). Unfortunately this collection has not been digitised or in most part even photographed, which becomes very important both because many of these are type collections that would not be replicable, and because their age means that they are getting more and more fragile. Hence there is a need to digitise the information.

Suggested Responsibility: MoEF, through ZSI, BSI, Fisheries Survey of India, National Museum of Natural History, Bombay Natural History Society, National Zoological Authority, Institute of Microbial Technology and other microbial repositories, and other key institutions with collections; also in collaboration with key individuals having such collections.

Time Frame: 5 years.

Steps:

- i. Identify key repositories and collections (governmental, institutional and private);
- ii. Provide facilities and resources to digitise these collections, in standard format;
- iii. Feed the information into a central database, housed in the proposed IBIS, and to the proposed regional repositories;
- iv. Develop a mechanism of updating the records periodically.

4. Encourage Community Maintenance of Biodiversity-Related Community Knowledge Repositories, and Database of Formal Scientific Information, in Appropriate forms Including Oral, Written, Visual, Audio, and Electronic media. (Link to *Strategies 7.1.1.1 (Action 8), 7.1.5.7 (Action 3), and 7.2.6.2.*)

Justification: Local community knowledge of natural ecosystems and wild taxa is widespread and significant, yet the formal systems of research and information have not adequately respected or supported such knowledge. Facing erosion due to various factors, there is a critical need to facilitate the continuation, systematisation, and, where appropriate, recording of such knowledge and information. Secondly, communities often do not have access to relevant information and data from outside sources, and it is important to find ways of making this locally accessible to them. All this will help in adding to, or reviving value of, local knowledge.

Suggested Responsibility: Traditional and formal village-level institutions, including women's associations/SHGs, and Biodiversity Management Committees to be set up under the Biological Diversity Act (*see Section 7.3*), on their own or in association with academic/research institutions and NGOs or government agencies such as National Bureau of Plant Genetic Resources, MoEF, National Bioresources Development Board, NBRI, Ministry of Science and Technology, Ministry of Tribal Affairs, Ministry of Social Justice and Empowerment, National Innovations Foundation, and groups working on Community or Peoples' Biodiversity Registers (*see Section 7.2.6.2 Action 4, and Section 7.1.5.4*).

Time Frame: 10 years, keeping in mind the different pace of different communities and sections, the need to build capacity to handle databases, and to take adequate measures to protect the knowledge (*see Strategy 7.1.5.4 on traditional/community knowledge protection*).

Steps:

- i. Facilitate exchange visits of community members to sites where community level knowledge management is ongoing, including villages where Community or People's Biodiversity Registers have been produced by the communities themselves; in this, especially facilitate women's travel.
- ii. Develop manuals containing culturally sensitive methods for information management, methods for combining oral, written, audio, visuals, and electronic media in mutually respectful ways, and methods for protecting traditional knowledge. For this, build on lessons learnt from the experience of groups like Centre for Ecological Sciences, Deccan Development Society, Foundation for Revitalisation of Local Health Traditions, Navdanya, and National Innovations Foundation.
- iii. Provide appropriate database management facilities to village institutions, and link such repositories with the state and national level biodiversity information systems.
- iv. Provide all relevant outside information to the women and men of village communities, in local languages and also pictorially (*see also Strategy 7.1.8.8 on Right to Information*).

A special challenge is the linking of nomadic communities to such database and information systems. In all this, the focus should be on maintaining the oral traditions of knowledge maintenance and transmission, supplemented by other media where appropriate.

5. Set Up Regional Biological Diversity Repositories or Museums

Create or strengthen repositories and museums for each major biogeographic region, displaying and storing plant and animal specimens that belong to that region. Existing institutional repositories/museums or NGO/individual collections could be strengthened and consolidated. These repositories should have regular links to IBIS.

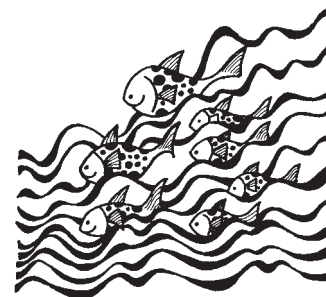
Justification: Identification of species by students, researchers, and ecosystem managers is often difficult, in the absence of repositories to refer to. Such facilities would also help in further research, and in educational and training initiatives.

Suggested Responsibility: The National Museum of Natural History to lead, in collaboration with institutions like ZSI, BSI, NBPGR, NBFGR, NBAGR, BNHS, FRLHT, zoological and botanical gardens, etc.; support from international institutions like International Council of Museums.

Time Frame: 10 years

Steps:

- i. Inventorise the specimens and exhibits already in place in existing repositories and museums (including collections maintained by NGOs and individuals), and identify key gaps;
- ii. Conduct nationwide search for specimens to fill these gaps, without taking any from the wild and minimising the need for additional collections;
- iii. The use of digitised information should be maximised in new repositories, to minimise the need for physical specimens;



- iv. Provide greater facilities to existing repositories and museums to upgrade the displays and storage, and create repositories/museums in regions where they do not already exist; and;
- v. Carry out capacity-building and provide educational tools to be used for personnel of such repositories.

Relevant Ongoing GOI Schemes/Programmes:

- The Scheme for Establishment and Maintenance of Seed Bank, Ministry of Agriculture
- (i) Division of Germplasm Conservation, (ii) National Genebank, NBPGR.
- Bioprospecting and Molecular Taxonomy under Research and Development, Department of Biotechnology

7.1.1.3 Strategy: Enhance Understanding of Links Between Cultural (Including Linguistic) Diversity and Biological Diversity

Study and document the relationship between biodiversity and cultural diversity (linguistic, lifestyles, spiritual/religious beliefs and practices, art/dance/music/crafts, kinship and other intra-community ties, etc.), in the case of various ethnic communities and various ecological contexts, and for both women and men. In particular, document the links between biodiversity, cultural practices, and ecosystem benefits like hydrological functions, e.g. in sacred groves. For such studies, build on the oral history of the women and men of communities, documentation by and with communities, anthropological work, the *Culture and Biodiversity Thematic BSAP*, and other work that would provide an insight into this relationship.

Justification: While it is evident that the enormous cultural diversity of India is at least partly a response to diverse ecological conditions, and that various cultures have helped to sustain nature and natural resources, there is little systematic understanding of the myriad ways in which this relationship has been manifested. Available information on this is scattered, both amongst communities themselves and in various academic and activist works. Cultural practices that lead to biodiversity destruction, especially in changed circumstances, are also important to understand. In the absence of such consolidated and systematic understanding, the potential of diverse cultural practices to help in conservation and sustainable use remains under-utilised; the contribution of biodiversity to the maintenance of cultural heritage and dynamism remains under-recognised; and methods to facilitate the modification of cultural practices that are ecologically destructive cannot be developed. Enhanced understanding would aid in plugging these gaps, as also in implementing crucial policies, laws, and programmes related to conservation and to people’s livelihoods and rights.

Suggested Responsibility: Community institutions and networks including local women’s associations, and NGOs/academic institutions working with communities, with guidance from the Anthropological Survey of India, Indian Council of Social Science Research (ICSSR), Indian Council of Cultural Relations (ICCR), Tata Institute of Social Science (TISS), MoTA, various national biodiversity-related survey organisations, and relevant institutions like IGNCA, Indian Statistical Institute, National Museum of Man, various centres for Tribal Research and centres for Women’s Studies, etc.

Time Frame: One year to collate existing information, identify gaps and frame methodologies; ongoing thereafter.

Steps:

- i. ICSSR and ICCR, with MoTA, to collate and assess existing documentation on the subject, identify key gaps in coverage of communities, ecological contexts, and topics, and work with community members on a commonly acceptable methodology and framework of study;
- ii. Set up gender balanced inter-disciplinary teams from universities/colleges and research institutions to carry out the studies;
- iii. Initiate nationwide studies, by community institutions in partnership with the above-mentioned teams and others, on a range of topics including: (a) relationship between linguistic and biological diversity; (b) links between cultural practices of various kinds (including the ones mentioned above) and biodiversity; (c) current biodiversity significance and relevance of existing cultural practices and heritage, especially how this



- could be used to further biodiversity conservation, sustainable use, and equity goals; (d) culturally valued species that could also be 'keystone' species; and (e) threats posed by cultural practices that have changed or are inappropriate in changed circumstances, and how these could be modified;
- iv. Collate this information into local/regional/national databases, linked to IBIS (*Strategy 7.1.1.2*), with appropriate safeguards to protect traditional knowledge from piracy (*see Strategy 7.1.5.4*);
 - v. Feed results of this research into policies and programmes relating to education, social welfare, environment, community development, and other sectors.

7.1.2 Wild Biodiversity: Strategies and Actions for *in Situ* Conservation

(**Note:** This chapter should be read in conjunction with the National Wildlife Action Plan 2002 and the National Forestry Action Plan 2000. The key points from these documents relevant to the NBSAP have been incorporated below, but this chapter goes well beyond what is contained therein. Also to be referred to in conjunction with this chapter are the *Wild Animal Diversity*, *Wild Plant Diversity*, *Natural Terrestrial Ecosystems*, *Natural Aquatic Ecosystems*, and *Micro-organisms Biodiversity BSAPs*, prepared under the NBSAP.)

Overall strategies:

1. **Achieve a Coverage of At Least 10% of India's Territory Under Various Conservation Categories (With At Least 2% Inviolate on an Average, Higher for Hotspot Areas)**, of the following kinds (with various participatory management and control regimes suggested below and in *Section 7.1.2.2*):
 - i. National parks, sanctuaries, conservation reserves, and community reserves, under the Wild Life (Amendment) Act, 2002;
 - ii. Biodiversity heritage sites under the Biological Diversity Act, 2002;
 - iii. Community Conserved Areas under various central and state laws, or through customary law and spiritual/religious protection (including 'hotspecks' – small areas rich in biodiversity)
 - iv. Biosphere Reserves, World Heritage Sites, Ramsar Sites, Ecologically Sensitive Areas, and ecosystems of special conservation status such as mangroves and coral reefs, under various central and state laws.
2. **Enhance *in situ* conservation across the rest of the landscape and seascape**, including in areas controlled/managed by private, institutional, corporate, urban, and government agencies (including armed forces); enhance the potential by **regenerating/restoring degraded areas** as close to the original ecosystem as possible.
3. **Provide special attention to threatened and endemic species and taxa**, including their protection across their entire range, and reintroduction and population enhancement where possible; **also provide special attention to hitherto neglected groups**, such as 'smaller' fauna and non-flowering plants.
4. **Tackle non-utilisation threats** to wildlife, including invasive species, pollution and toxics, etc.
5. **Tackle human-wildlife conflicts**, both to safeguard wildlife populations from any backlash, and to minimise the crop/livestock/property/life damage caused.
6. **Strengthen trans-boundary conservation measures**

7.1.2.1 Strategy: Strengthen and Expand the Official Protected Areas Network

Actions

1. Review Currently Prevalent Management Practices from the Point of View of Biodiversity, and Prepare Comprehensive Management Plans

Carry out a participatory impact assessment, from the biodiversity point of view, of wildlife management practices currently employed in PAs, including zoning, water provision, fire control, grassland burning, salt licks, tree plantation, pasture development, soil and water conservation, infrastructure development, etc.

Prepare comprehensive management plans for all PAs based on the above and other research inputs outlined in Strategy 7.1.1.1. These plans should contain baseline information on the PA, analysis of major threats and opportunities, a historical account of land/water use changes relevant to biodiversity, the key conservation priorities in the area, assessment of ongoing management inputs, and a detailed blueprint on management which provides at least a 10-year perspective. These plans should be made by and with the full involvement of the primary right-



holders and stakeholders of the area, including local officials and local communities (*see Action 7 below*). These detailed management plans would form the basis of accessing funding/support from outside.

Justification: PA management has some set prescriptions, in terms of zoning, water, fire, forage, and other needs of wildlife. Many of these have been implemented for years, without any long-term assessment of their biodiversity impacts. It is now known that some practices, like grassland burning for ungulates, may be causing serious damage to other elements of biodiversity. Tree plantation, may do more harm than good, e.g. on grasslands. Also, in many PAs, management activities have focused on developing infrastructure, including concrete structures which do not go well with the landscape values of the PA. Waterholes, check dams, roads and causeways, could adversely affect the habitat and many species. The entire approach to management intervention needs a thorough and comprehensive review. Actions that clearly impinge on the biodiversity values that the PA has been created for should not be undertaken. Also PA management often focuses on individual animals rather than populations, e.g. in intervening to save individual animals that are sick or injured. PAs should really be managing populations and flora-fauna assemblages, and their long-term viability and evolutionary potential.

While many PAs have zonation, very often this exists only on a map, with the exception of the national parks and sanctuaries that receive high levels of attention. At times, zones have been established more on the basis of administrative convenience rather than on ecological grounds. Where established on an ecological basis, zoning has at times ignored the existing socio-economic context, and has therefore been a failure or led to conflict with local communities, who have without their knowledge been put into 'core zones' and are therefore threatened with displacement or severe resource access restrictions.

Different PAs have different objectives, ecological conditions, and socio-economic contexts. Based on these and depending on the objective for which each PA has been set up, comprehensive management planning would be required. Many PAs lack such a planning process, and many of them have only very brief workplan-cum-budgets by which they operate.

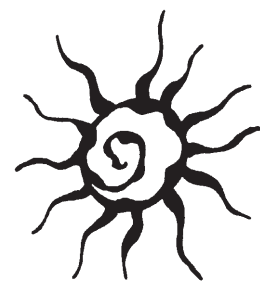
Suggested Responsibility: State forest/wildlife departments including PA management authorities, in collaboration with wildlife research institutions such as WII, IISc, BNHS and SACON, relevant local NGOs, and knowledgeable experts (including members of local communities).

Time Frame: 2 years for representative set of sites; ongoing every 3 years for all PAs thereafter.

Steps:

- i. Collate existing studies of the impact of management activities on biodiversity;
- ii. Identify major gaps in these studies, and institutions/experts who could take these up;
- iii. Frame a protocol for impact assessment, with common indicators and methodologies; these should include local community indicators and methods where relevant;
- iv. Carry out 5-year studies in a selected sample of PAs, representing biogeographic types and covering the full range of management interventions;
- v. Assess the results for management recommendations, and use these in further management planning, including through a circular that could be issued to all PAs regarding prescribed management interventions;
- vi. Carry out similar studies at other sites, and further studies at the earlier set of sites, including of the new management prescriptions;
- vii. Review current zonation in/around PAs, and undertake revisions, as also fresh zonation where it does not currently exist. The basis for zonation should be ecological information and prevailing socio-economic realities, rather than administrative convenience. It is imperative that more innovative zoning categories be created, depending upon the local ecology of the system, the status and ecology of the target species, and the socio-economic needs of the local communities.
- viii. Prepare, through a joint team of government officials, NGOs, and local community experts, management plans with a long-term perspective for each PA.





Relevant Ongoing GOI Schemes/Programmes:

MoEF's (i) Biosphere Reserves Programme, (ii) Development of National Parks and Sanctuaries, Project Tiger, and Project Elephant activities, under Conservation of Natural Resources Programme.

2. Improve the Effectiveness of Protected Area Management

Review the adequacy of staff, funding and equipment provided for protected area management. This needs to be linked with the objectives for which the PA was set up and the results of the review of its effective functioning. Staffing patterns also need to be redesigned, taking into account the changing socio-economic and conservation scenario in India. Innovative mechanisms, including recruiting people from communities (as in Kalakad-Mundanthurai Wildlife Sanctuary, Tamil Nadu), NGOs, and academic institutions, should be considered for a variety of tasks (in conjunction with Action 7 below).

Justification: Protected areas have generally suffered from lack of human, financial and material resources. Even when fully staffed, the personnel in most PAs need to cover huge areas often running into tens of square kilometres per person, and are severely under-trained to perform the difficult tasks they are entrusted with. Given the increasing threats faced by PAs, there is an urgent need to provide adequate resources and staff to meet these threats to the habitat and species.

Suggested Responsibility: State Wildlife Advisory Boards (through nodal departments) with the Wildlife Division of MoEF, in association with Revenue and Tribal Welfare Departments, academic/training institutions such as WII, IIFM, IISc, FRLHT, CEE, state Forestry Training Institutes, and conservation NGOs like ATREE, BNHS, CPREEC, etc.

Time Frame: 5 years

Steps:

- i. Set up a task force in each state, under the State Wildlife Advisory Board, to carry out surveys of the adequacy of management tools in each PA, starting with a set of priority PAs in each state;
- ii. Identify resources and facilities to plug the shortfall of management inputs;
- iii. Conduct training and orientation programmes for PA staff, to help them tackle new challenges and opportunities in conservation. These should include participatory methods of conservation, use of indigenous knowledge, emerging medicinal and biotechnological values, gender and equity issues, threats from globalisation, climate change, integration of livelihoods into conservation planning, biological diversity legislation, monitoring and feedback for adaptive management and so on. The training programmes must incorporate visits to successful PAs and community conservation sites;
- iv. Recruit new staff to help reduce the average age of forest staff (which is now quite high); if need be, provide exemption to ecological sectors from the government policy prohibiting new recruitments.

Relevant Ongoing GOI Schemes/Programmes:

MoEF's (i) Beneficiary/Oriented Scheme for Tribal Development Objectives and Components, (ii) Eco-development Scheme in and around National Parks and Sanctuaries including Tiger Reserves, and (iii) India Eco-development Project under Conservation of Natural Resources Programme.

3. Settle the Rights of People Inside Protected Areas

Settle, through a participatory process, the rights of communities and individuals within and around protected areas, and of mobile/nomadic communities that traditionally use protected areas. This process must be based on updated records and information, carried out in a fully transparent manner, involve the concerned communities, and while giving priority to the conservation objectives of each protected area, also provide for livelihood security to traditional users. These actions need to be taken keeping in mind the relevant Supreme Court orders on this subject.

Justification: The process of settling the rights of people within protected areas has been subject to considerable arbitrariness, delays, conflicts, and unscientific and non-participatory decision-making. A Supreme Court ruling on this issue in 1997 did not help matters, as no clear guidelines were issued. As of 2003, rights have still not been settled in a large number of PAs, and there continue to be disputes and suffering on account of ad hoc settlement in others (see Box 6.47). This continuing situation places serious hurdles in the way of rational management of PAs, and causes continued harassment to local people. A systematic, guided, and participatory process of settlement is therefore very urgently needed.

Suggested Responsibility: State governments, in association with national and state-/local-level institutions and NGOs, with full involvement of community institutions.

Time Frame: 3 years (subject to Supreme Court orders on this subject).

Steps:

- i. WII or other similar institute to formulate a set of guidelines for carrying out the settlement process, building on guiding notes developed by some states such as Maharashtra and NGOs such as Kalpavriksh, and on innovative rights recording processes such as that carried out by NGOs in Melghat Tiger Reserve, Maharashtra;
- ii. Teams of people representing communities, the district administration, the Forest Department, Tribal Welfare Department, local NGOs and research groups should spend at least one year determining resource uses in each PA (and not just rights recorded in official documents), analysing indicators to assess the ecological impacts of these uses, consulting with the concerned communities, and deciding on what activities may and may not continue depending on the conservation objectives of the area and the needs of livelihood security (it may be worthwhile trying out the process in a few PAs first, maybe one per state, and then use the lessons learnt for the rest of the country's PAs);
- iii. Establish clear and unambiguous rights for activities that are considered justified, and provide mutually acceptable alternatives and/or compensation for those that need to be stopped;
- iv. Set up a system of periodic updating of the exercise of rights, in particular monitoring the impact of activities that may be increasing in extent or intensity;
- v. Review the rights every 5 years, through a participatory process similar to Step (ii) above.

4. Take Action to Tackle Threats to PAs, Based on a Full Review of Their Current Status

(To be read with *Strategy 7.1.2.6*)

Review the current conservation status of protected areas, building on available or ongoing assessments, such as those mentioned in Action 8 in this section and *Section 7.1.1.1*, and bring in measures to enhance this status by tackling the major threats. Efforts should include realignment of PA boundaries to achieve better ecological coverage and more effective legal protection, including through the exclusion or re-categorisation of densely populated and ecologically unimportant areas, while ensuring that no realignment should take place for non-ecological or non-conservation reasons.

Justification: Most protected areas in India face a series of management and conservation problems, and there are many PAs, which exist only on paper. A review as suggested will clearly identify the effectiveness of each protected area, and also identify the specific threats faced by each PA. This can lead to a more objective prioritisation of the PAs, and their re-categorisation if necessary. The specific identification of threats will also enable the preparation of a more effective and targeted management plan for each PA, and deployment of human and financial resources towards tackling these threats.

Suggested Responsibility: Coordination by WII or other suitable national institution, through conservation NGOs and university research departments, in collaboration with local communities and forest/wildlife departments.

Time Frame: 3 years for an initial set of priority PAs, and 10 years for the full network.



Steps:

- i. WII or other relevant institution to develop a flexible set of guidelines, including criteria (formal and community) and participatory assessment methods, to assess the status of different kinds of PAs (*see also Strategy 7.1.1.1*);
- ii. Train state-level institutions, NGOs, government agencies and communities to carry out the status survey using these guidelines (ensuring their adaptation to site-specific situations through a participatory process);
- iii. Identify a set of priority PAs (at least one in each state) to carry out the surveys; these should build on studies that may already exist including those at national level like WII's and IIPA's studies, and those at state level (*see Chapter 6.1.1.2*);
- iv. Facilitate the surveys – with coordination by the same national institution – and frequent exchanges of experience and results;
- v. Prepare a consolidated report for public dissemination, with recommendations for action by state governments and others;
- vi. Facilitate appropriate action by state governments and others; such action should be immediate for areas where the status is already known and there are imminent or ongoing threats; the action should ensure that key 'development' or industrial projects threatening biodiversity in such areas are relocated or appropriately modified (*see also strategies/actions on development sectors, including water development (7.1.7.2), energy and infrastructure (7.1.7.3), mining (7.1.7.4), power stations (Box 7.1.7.1), paper mills (Box 7.1.10.1), etc.; focus also on the impacts of fire*);
- vii. Provide a mechanism to regulate large-scale development or commercialisation in the buffer zone, or in a 5-km radius around the PA, whichever is larger; extension of the Ecologically Sensitive Areas provision of the Environment Protection Act could be considered for this;
- viii. Carry forward the survey to other PAs, with the same follow-up steps.

5. Take Special Measures for PAs and Other Sensitive Ecosystems Affected by Armed Conflicts

Adopt special measures regarding PAs and other sensitive ecosystems that are affected by armed conflicts, taking care to base these measures on a careful understanding of the root causes of the situation, and fully utilising the potential for conservation through dialogue and mediation.

Justification: Several important PAs and non-PA ecosystems particularly in border areas are badly affected by militant activities. This could be because of the activities of militant groups themselves, or poachers/timber thieves/others taking advantage of the situation, or the related activities of the police and armed forces. In very many cases, the official response to such situations has been to either step up forces, or to withdraw altogether. More innovative strategies are needed, which maximise the potential of conservation based on dialogue with the militant groups.

Suggested Responsibility: MoEF, Ministry of Home Affairs, state governments including Forest Departments, national and local NGOs working on the issue, including those with a potential for dialogue with militant groups, and the militant groups themselves.

Steps:

- i. Bring out a status report on areas affected by armed conflicts, and the historical roots of the conflicts; such a report should be based on independent evaluations by a mix of national and local conservation and human rights NGOs;
- ii. Carry out consultations amongst populations affected by armed conflicts and other concerned groups, and identify sections of these populations that are working on or willing to work on conservation initiatives (e.g. sections of the Bodo tribal youth are very willing to assist in the conservation of Manas Tiger Reserve, Assam; tribal youth in Manipur are involved with conservation of the Sangai deer and Loktak lake; groups from amongst militants in central and eastern India are concerned about deforestation, and so on);
- iii. While ensuring that local community role in the process is not displaced or side-lined, initiate dialogue with militant groups, especially on the plank of how important conservation is for the future of their own communities, and also through demonstration of the livelihood benefits that conservation could provide;
- iv. Where such dialogue does not work, despite repeated attempts, increase the presence and effectiveness of official conservation agencies with appropriate provision of security;



- v. Establish trans-boundary links with neighbouring countries, or between states, to work out mutual conservation and anti-poaching/anti-timber theft activities (see *Strategy 7.1.2.9*).

6. Manage Buffer Areas Around PAs as Ecologically Sensitive Areas, Within a Landscape/Seascape Approach

Declare buffer areas around each PA where feasible, varying in size and shape depending on the local ecological and social contexts. Entrust their management to joint or community-based institutions along with the PA authorities, with a view to support the conservation objectives of the concerned PA, while ensuring the security of natural resource based livelihoods and customary rights. Benefits derived from the PA (such as those from tourism revenues) could be channelised to benefit communities in this buffer zone. A landscape or seascape approach would be most suited for this purpose (see *Section 7.0.1*). Legal backing can be provided by declaring such areas as Ecologically Sensitive Areas under the Environment Protection Act (as recommended in the National Wildlife Action Plan), and enabling communities and civic authorities to check haphazard development. Community or joint forest management (modified as per *Strategy 7.1.4.3, Action 4*, and *7.1.5.3, Action 3*), could be promoted in appropriate lands in the buffer zone.

Existing experience of tiger reserves, and other protected areas where external buffers have been declared in the past, should be used to learn lessons and draw up appropriate measures for all new buffers.

7. Move Towards a System of Joint or Participatory Management

(To be read in conjunction with the settlement of people's rights, see *Action 3 above*).

Ensure the participation of local communities and other citizens in PA management, through legal, administrative, and institutional measures that involve them from planning to implementation and monitoring stages.

Justification: The need for people's participation has been expressed in a number of recent documents and workshop reports brought out by government agencies and NGOs. To give some examples:

'There is increasing recognition of the need to broad-base the support for wildlife conservation to all sectors of society, especially by involving local communities as central partners in the management of conservation areas and related programmes, and ensuring their livelihood security in harmony with conservation objectives' (Report of the Working Group on Wildlife for the IXth Plan (1997-2002), MoEF, May 1996, pg. 16).

'The entire landscape level planning, including ecodevelopment, PA management and zonation, will need to be carried out in a collaborative/participatory manner, involving various stakeholders. In this, decision-making should be jointly done by 'primary stakeholders' (defined to include local communities and the PA authorities) while other stakeholders should be part of the consultative process' (Draft recommendations of the National Workshop on Ecodocumentation, Wildlife Institute of India, 24-26th November, 1998).

'Joint custodianship include joint planning, decision-making, implementation and monitoring for protection of species and habitats and for the use and sharing of resources, both within PAs and other conservation areas. The respective roles and responsibilities of each custodian group be defined clearly, and appropriate joint institutions for each area be constituted.' (Proceedings of Workshop on Biodiversity Conservation in Maharashtra: Vision Beyond 2000, 3-5 September, 1998, Maharashtra State Forest Department).

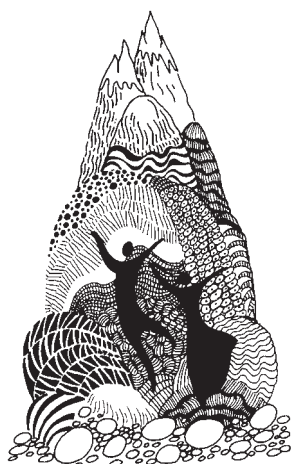
The National Wildlife Action Plan (NWAP) also contains a number of recommendations to move towards greater participation.

Suggested Responsibility: (as given in individual steps below).

Time Frame: (as given in individual steps below)

Steps:

- i. Evolve guidelines to centrally involve local communities in planning and managing PAs, in equal partnership

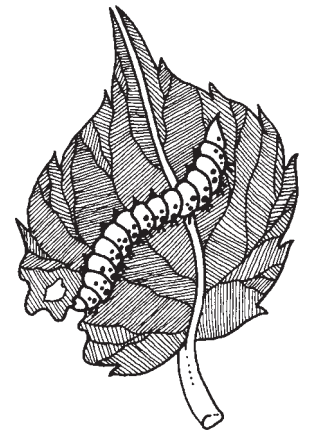


with the Forest Department and other relevant departments. Ecodevelopment (defined as ecologically sound development) would be one component of this. These guidelines would complement the relevant sections of WII's Guidelines for Management Planning of PAs.

Suggested Responsibility: WII, MoEF, IBWL, in collaboration with national NGOs and select community-based organisations such as Tarun Bharat Sangh, Kerala Sastra Sahitya Parishad, etc.

Time Frame: 6 months

- ii. Initiate pilot projects for such participatory/joint management of selected PAs, and subsequently expand the models thus evolved into other areas. Some of the current ecodevelopment sites (such as Kalakad Mundanthurai in Tamil Nadu and Periyar in Kerala), or others where local communities and NGOs are well-organised and already involved in conservation activities (such as Sariska and Kailadevi in Rajasthan and Melghat in Maharashtra), could be taken up as pilot sites. The initial sample should as far as possible be biogeographically and culturally representative, also keeping in mind the state of readiness amongst local officials and communities. Continuous research and monitoring would help to derive lessons from these cases, for use in other areas.



Suggested Responsibility: State Forest or Wildlife Departments, local NGOs, with support from MoEF

Time Frame: (for pilot projects) Initiation within one year, projects continuing on experimental basis for 5 years; next phase of expansion ongoing thereafter.

- iii. Create institutions for joint or participatory management, as per the National Wildlife Action Plan, and as partly provided for in the Wild Life Protection (Amendment) Act 2002. These institutions could be Joint Management Boards or Committees for each relevant PA, incorporating local self-government-level Biodiversity Management Committees as per the Biological Diversity Act 2002, with appropriate weightage to professional managers or local community members according to the legal category of the site. In addition, more active involvement of local community representatives in larger bodies ensuring gender balance in their membership (at regional/district/state level), including the State Wildlife Advisory Boards, should be encouraged. At all these levels, community decision-making should be encouraged at the full *gram sabha* (village assembly) level, and there should be special effort to involve women and other underprivileged sections. It is equally important to build local capacity for monitoring of the efficacy of ongoing management through appropriate criteria and indicators and chronicling etc., so as to make the process flexible and participatory, as being attempted in the village botanists training programme initiated by FRLHT.

[**Note:** Such institutions were recommended in the 9th Plan: 'It is proposed that for each wildlife reserve a Management Committee, having representatives of panchayats of all the villages located within and around 10 km radius of the reserve is formed. The Committees should be involved both in the finalisation of the ecodevelopment strategy for the area and implementation of the management plan for the wildlife reserve' (Report of the Working Group on Wildlife for the IX Plan (1997-2002), MoEF, May 1996, pg. 33).

Suggested Responsibility: State Forest or Wildlife Departments, with support from MoEF

Time Frame: Within 1 year of initiation of participatory management at each site.

- iv. Evolve an action plan to provide a series of incentive and benefit-sharing measures to encourage local community members and other citizens to participate in wildlife conservation in PAs (*see Strategy 7.1.2.3, Action 2*).
- v. Ensure, through independent monitoring and the use of appropriate criteria, that resettlement of people from PAs is voluntary and ecologically appropriate, and achieves the minimum standards of resettlement and

rehabilitation, including the measurable upgradation of livelihoods and cultural integrity for the affected populations. Appropriate guidelines for this may be drawn up, which include the pre-requisite of making forest land available for such resettlement, after careful impact assessment of such a move.

[**Note:** Project Tiger and the GEF-funded ecodevelopment project have both resolved not to cause any forced displacement, and the 9th Plan document on wildlife provides for this under the Beneficiary-Oriented Scheme: 'The relocation would be taken up only in respect of those families who agree to move outside willingly' (Report of the Working Group on Wildlife for the IX Plan (1997-2002), MoEF, May 1996, pg. 35). The NWAP also stresses on voluntary relocation.]

Suggested Responsibility: Development of guidelines for voluntary relocation, with monitoring by appropriate local/national institutions (e.g. Tata Institute of Social Studies, Indian Social Institute), supported by MoEF; relocation by relevant government departments with full involvement of community institutions, and social work and action groups.

Time Frame: 6 months for guidelines, building on already existing proposals on R&R by a number of NGOs; 1-5 years for experimental sites such as Koyna in Maharashtra, Bandhavagarh in Madhya Pradesh, and Sariska in Rajasthan; ongoing for other areas subsequently.

- vi. Organise, at each existing PA, dialogues with affected populations, with the aim of understanding their perceptions and difficulties, initiating participatory management processes dealing with these difficulties, and helping in re-designation, zoning and other measures suggested in other Actions in this section. Set up a regular forum for such dialogues, to meet at least once in the 6 months for the entire PA, and more frequently in individual settlements.

Suggested Responsibility: State Forest or Wildlife Departments, Revenue and Tribal Welfare Departments, local NGOs, Panchayat bodies, and other village level institutions such as VFCs and EDCs.

Time Frame: Immediate initiation in as many PAs as possible, ongoing thereafter.

- vii. Hold public hearings before declaring new PAs and other special conservation measures, at locations in/around the proposed sites. This is also as required by the Biological Diversity Act 2002. Ensure that these hearings are well-attended, and that underprivileged sections including women have a full voice in them; where this is difficult, organise separate hearings with the underprivileged sections to ascertain their opinions and needs.

Suggested Responsibility: State Forest or Wildlife Departments, with support from Revenue & Tribal Welfare Departments, local NGOs and MoEF, and Panchayat bodies.

Time Frame: Prior to any new PA being proposed for declaration.

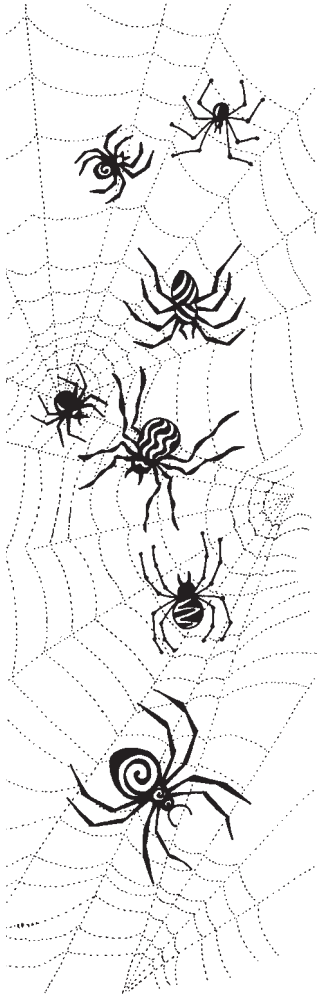
- viii. Provide rules or guidelines within the Wild Life Protection (Amendment) Act 2002, or amend it as necessary, to give legal backing to the above steps.

Ongoing Relevant GOI Schemes/Programmes:

(i) Beneficiary/Oriented Scheme for Tribal Development Objectives and Components, (ii) Eco-development Scheme in and around National Parks and Sanctuaries including Tiger Reserves, and (iii) India Eco-development Project activities under Conservation of Natural Resources Programme the MoEF.

8. Analyse the Current Protected Area Coverage and Suggest Changes/Additions to Make It Representative of India's Biodiversity

Undertake a comprehensive analysis of the protected area coverage of ecosystems and taxa, to assess gaps in coverage and recommend a more comprehensive coverage. This exercise should involve:



- i. Consolidating the Biogeographic report of Wildlife Institute of India (WII), IISc, the Biodiversity Conservation Prioritisation Project (BCPP) led by WWF, the Important Bird Areas Project (IBA) coordinated by BNHS (see *IBA Sub-thematic Review*), the PA survey by Indian Institute of Public Administration, Conservation Assessment & Management Plan (CAMP) Workshop recommendations compiled by ZOO & FRLHT, the Community Conserved Areas Directory work of Kalpavriksh, and the recommendations made in various BSAPs under the NBSAP (see *Box 7.1.2.1*);
- ii. Further analysis to assess if the recommendations from the above would cover the full range of ecosystems, ecosystem benefits, species and species assemblages, threatened and endemic species, and regional hotspots for biodiversity; special attention should be paid to neglected elements of biodiversity such as 'lesser' plants and animals, marine/coastal and grassland ecosystems (see *box 7.1.2.1*), and so on. This is especially relevant for marine protected areas where protection extends only up to the water's edge or only the islands, but not the actual waterways beyond and in between which also harbour rich biodiversity. Attention is also needed for critical trans-boundary sites (see *Strategy 7.1.2.9*);
- iii. Integrating socio-economic parameters into the above exercises, including from earlier and ongoing studies such as that by the Indian Institute of Public Administration (see *Section 6.1.2*);
- iv. Developing a set of ecological and socio-economic criteria for determining whether an area should be included in the PA network or not, what category of PA it should be, and what size it should have; in such a framework, size of the area to be declared should be a secondary criterion to others like uniqueness, biodiversity richness, endemism and representativeness, so that even very small areas can qualify; assess current Reserved Forests and Protected Forests for possible inclusion into the PA network;
- v. Assessing the efficacy and rationale of current 'core zones' and 'inviolable' areas in PAs, and mapping, in consultation with wildlife scientists and local communities, a national network of areas within and outside official PAs, for total protection (see *Action 9 below*);
- vi. Assessing whether the current PAs are rationally categorised from the point of view of the above criteria, and recommending changes, if any, including re-designation into the new PA categories of Community Reserves and Conservation Reserves under the Wild Life (Protection) Amendment Act, 2002, or other categories under other relevant legislation including the Environment Protection Act, and the Biological Diversity Act.

Justification: A number of studies (including those mentioned above) have identified many key gaps in the PA network, and suggested priority areas for conservation on the basis of biogeography and ecology. However, more work is needed to bring in the full range of biodiversity concerns, and to consolidate the recommendations from these different reports into one cohesive document. It is also necessary to reconsider the current categorisation, as there are inadequate criteria and non-systematic processes used in the current system, often creating legal anomalies like having villages inside national parks, or creating unnecessary conflicts with local communities. Now two additional PA categories are available within the Wild Life Protection Act, and also given that other PA-like categories may be available under laws like the EPA and the Biological Diversity Act 2002, a thorough review of categorisation would be highly productive.

Suggested Responsibility: MoEF and state Forest or Wildlife Departments, through WII, BNHS, WWF, IISc, and other research, conservation and social action organisations such as SACON, ATREE and Kalpavriksh, with state revenue departments.

Time Frame: 2 years.

Steps:

- i. MoEF to set up a working group consisting of members of WII, BNHS, and other groups to take up the tasks set out above, by seeking inputs from wildlife and biodiversity experts (including local community members, NGOs and government officials) across the country, carrying out consultations and public hearings in different regions, and preparing a comprehensive, cohesive set of recommendations;
- ii. MoEF to put up the report to the National Board for Wildlife, and to State Wildlife Advisory Boards for necessary action (see *Action 9 below*).



Ongoing Relevant GOI Schemes/Programmes:

(i) Wildlife Conservation, (ii) Coral Reefs, (iii) Mangroves, (iv) Wetland Conservation Programme, and (v) Biosphere Reserves sub-programmes under Conservation of Natural Resources programme of MoEF.

**Box 7.1.2.1 Conserving Neglected Ecosystems:
Grasslands, Wetlands, and Coastal/Marine Areas**

(Recommendations in various BSAPs)

The **Natural Terrestrial Ecosystems Thematic BSAP** and **Natural Aquatic Ecosystems Thematic BSAP** suggest the need to add under-represented ecosystems in the protected area network, or conserve them through other means. This includes grasslands, freshwater wetlands, and coastal/marine areas. Some other BSAPs that have recommended specific strategies for these ecosystems include (this is not a comprehensive list, only an indicative one):

Grassland Ecosystems

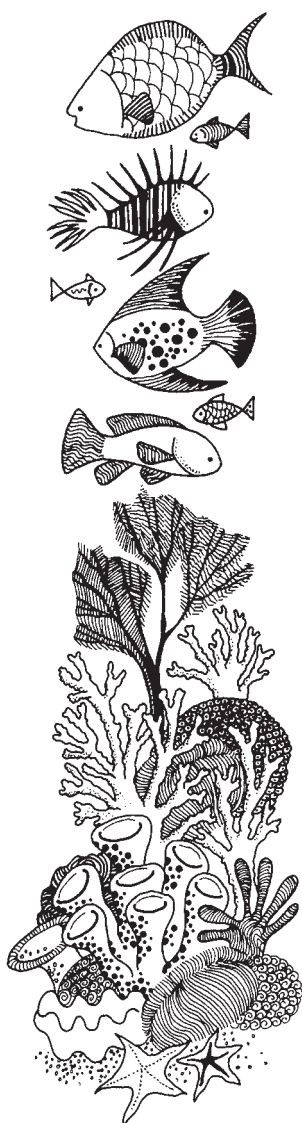
- The **Assam State BSAP**, while listing the names of specific grasslands in the State, has highlighted the need for a study towards their regeneration and restoration.
- The **Rajasthan State BSAP** has a specific strategy for grasslands, which indicates the need to 'set up a network of preserved or protected grasslands habitats, representative of the diversity of overall grassland resources of the state and mark these as out of bounds for general development activities, possibly by bringing these under the category of protected areas.'
- The **Western Himalaya Ecoregional BSAP** repeatedly stresses the importance of conserving grasslands, especially due to their critical ecosystem benefits, through participatory management with resident and nomadic communities.
- The **Gujarat State BSAP** stresses improved protection and restoration of grasslands, gradual removal of *Prosopis juliflora*, soil moisture conservation work and development programmes for grazier communities such as Maldharis.

Marine/Coastal Ecosystems

- The **East Coast Ecoregional BSAP** has an action point for the identification of highly disturbed/degraded sites as PAs.
- The **West Coast Ecoregional BSAP** highlights the need for protecting the existing biodiversity-rich and ecologically sensitive areas by declaring them as protected areas, and lists some potential sites.
- The **Kachchh Sub-state Site BSAP** recommends granting sanctuary status to specified inland wetlands and coastal/marine ecosystems in the region.
- The **West Bengal State BSAP** focuses on the Sundarbans as a unique ecosystem, and highlights the need to 'find practical, workable livelihood solutions for the people' who reside here.
- The **Kerala State BSAP** suggests that mangrove areas be declared protected areas entrusting the management with local bodies.
- The **Gujarat State BSAP** recommends the declaration of the Gulf of Kachchh and Gulf of Khambhat as twin marine biosphere reserves, and urgent protection of mangrove patches.

Freshwater Wetland Ecosystems

- The **Gangetic Plains Ecoregional BSAP** points to the enormous wetland diversity of the ecoregion, and suggests an integrated system of conserving them including legal protection, participatory management, control on commercial fisheries, restriction on introduction of exotics, and control of pollution.
- The **West Bengal State BSAP** notes that other than 54 natural and 9 human-made wetlands of over 100



ha each, there are innumerable small waterbodies that are important; it suggests that such records should be maintained at district level, with classification according to biodiversity and livelihood significance, and appropriate conservation strategies;

- The **Manipur State BSAP** focuses not only on strategies for the unique Loktak wetland, but also several others in the Imphal Valley that are of biodiversity significance but have so far been neglected.
- The **Haryana State BSAP** suggests the declaration of deep pools in the rivers Yamuna and Ghaggar as fish sanctuaries, and overall conservation steps in these two rivers.
- The **Assam State BSAP** points to the need to conserve Majuli, the biggest river island in the world, situated in the Brahmaputra. It recommends preparation of a master plan incorporating flood and erosion control measures, conservation of the wetlands and the grasslands, conservation of the traditional institutions (*satras*), and declaration of some waterfowl concentration sites as bird sanctuaries.

9. Expand and Modify the Protected Area Network As Per the Suggestions Emanating from the Above Actions

Strengthen the protected area network by plugging the key gaps identified in the exercise above, and notify new areas or re-designate existing ones, under appropriate PA categories. *Move towards a coverage of at least 10% of the country (with at least 2% inviolate) under conservation areas, including protected areas (subject to the steps on consultation suggested below, and to Action 7 in this section), community conserved areas (see Strategy 7.1.2.2), and others (see Strategy 7.1.2.3).* Such re-designation in the case of marine national parks and sanctuaries must explicitly cover all waterways within the PA as well as adjacent waterways whose biodiversity is interlinked with the habitat that is being protected. Action can be immediately initiated in the case of areas recommended for protection by the existing reports mentioned in *Action 8* in this section. While implementing these recommendations, it is important that state governments undertake prior and full consultations with local communities (in the spirit of the recommendations of the National Wildlife Action Plan and the Biological Diversity Act, 2002), and take their concerns and priorities on board.

Justification: As in *Action 8* of this section, noting also that many of the proposed new areas as well as the existing ones are facing serious threats – hence the urgency of bringing them under appropriate protection regimes. This step also needs to be sensitive to socio-economic concerns, and to be taken in conjunction with other actions and strategies for moving towards participatory conservation models.

Suggested Responsibility: State Forest/Wildlife Departments, in consultation with MoEF, revenue authorities, and local institutions, NGOs, and experts.

Time Frame: 5 years.

Steps:

- State Forest/Wildlife Departments to take on board the recommendations as proposed in *Action 8* of this section;
- Conduct transparent public hearings and consultations in each of the proposed new sites, as well as existing ones, to discuss the proposals with potentially affected people and other concerned citizens;
- In the case of Community Conserved Areas that are sought to be made Community Reserves under the Wild Life (Amendment) Act, 2002, seek the informed consent of the communities before notifying them as per steps (iv) and (v) below (see also Strategy 7.1.2.2, *Action 3*);
- Notify, under the Wild Life (Protection) Act or other relevant legislation, the new areas proposed and accepted through the public hearing process;
- Re-designate the areas as proposed above into new categories under the WLPA or other relevant legislation;
- Notify, under relevant legislation including the WLPA and the Biological Diversity Act 2002, at least 2% of India's territory (including wetlands and coasts) as inviolate areas for wildlife conservation. This should be based on the assessment mentioned under *Action 8* of this section, and should include appropriate core



zones of officially designated protected areas, and relevant parts sacred groves and landscapes/waterscapes, community-conserved areas, and other ecologically sensitive or critical areas. Community consultation and consent for these areas is critical, to ensure that the extent and boundaries of the inviolate areas are agreed to (in the absence of which there is little chance of them remaining inviolate).

Ongoing Relevant GOI Schemes/Programmes:

(i) Wildlife Conservation, (ii) Coral Reefs, (iii) Mangroves, (iv) Wetland Conservation Programme, (v) Biosphere Reserves sub-programmes under Conservation of Natural Resources Programme of MoEF.

7.1.2.2 Strategy: Strengthen and Support Community Conservation Areas, Including Sacred Sites

Actions

1. Undertake an Assessment of the Biogeographic Coverage and Ecological Values of Community Conservation Areas (CCAs)

Conduct an assessment and mapping of the spread of community conserved areas (CCAs) in relation to biogeographic regions, and of their ecological, biodiversity, livelihood and cultural value. This would include sacred sites (groves, tanks, river stretches, mangrove/coastal areas and landscapes), resource reserves, village tanks, common lands, and other areas that are served (see Section 6.1.2.2).

Justification: Though there are possibly thousands of CCAs in India, there has been no comprehensive survey of these sites, or of their importance to conservation and livelihoods. CCAs have significant biodiversity (and livelihood/cultural) values, e.g. sacred sites and other community conserved groves in most parts of India are known to be critically linked to water sources and watersheds. In some cases, they represent surviving traditions of integrating conservation with sustainable livelihoods, as in the case of the Bishnois or the safety and supply forests in Mizoram. CCAs also form an important complementary system to official PAs, and can provide critical lessons in governance and management. A proper assessment as suggested here is urgently needed.

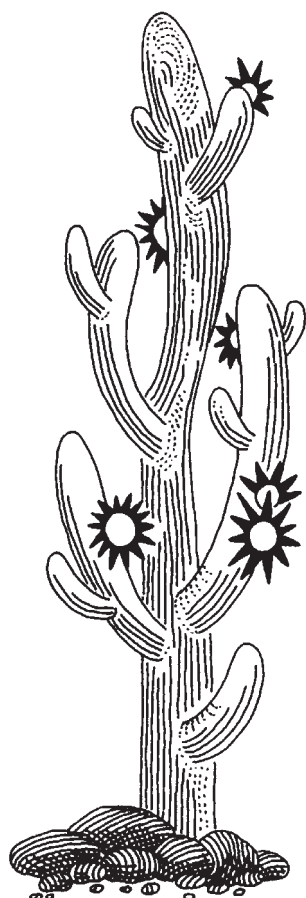
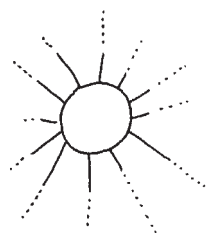
Suggested Responsibility: WII, Kalpavriksh, and other such organisations involved with CCAs, and in the case of sacred sites, the institutions mentioned in Action 3 below, in collaboration with local partners (including the communities) conserving the sites in each state and their associations/federations, with support from MoEF and relevant state government departments.

For this, build on the ongoing work on sacred sites by groups such as those mentioned in Action 3, and the task of preparing CCA directories and case studies by groups like Kalpavriksh (see Annexure 11), INTACH and VIKSAT, and community forestry networks in Orissa, Uttaranchal, Himachal Pradesh, etc. The ecological assessments could be done for a selected set of sites to start with (chosen according to biogeographical/ecological and ethnic coverage, and CCA type), and then expanded to others.

Time Frame: 3 years for a representative sample; 10 years for the rest.

Steps:

- i. MoEF to commission the above-mentioned groups to identify existing information and documentation on CCAs, building on the directories and case studies already carried out by these groups and others, and thereby identifying gaps in coverage;
- ii. These groups to facilitate a national process involving communities, NGOs, government officials and researchers, to discuss these gaps and plan for ways to fill them;
- iii. A report to be produced, akin to (but more inclusive of social aspects) WII's report on the biogeographic coverage of protected areas, relating to the existing biogeographic and cultural coverage by CCAs, and the additional sites that could be protected, supported, and/or declared, in order to fill these gaps.



- iv. Incorporate CCA location and mapping into the proposed Biodiversity Conservation Atlas (*strategy 7.1.1.1, Action 2*).

2. Review the Current Status of CCAs, and Strengthen Them Through Appropriate Means, Including Legal Notification

List currently known CCAs, assess their biogeographic coverage, analyse the threats they face, and develop appropriate support systems for them through a transparent consultative process in order to protect and enhance them, and to achieve better conservation and livelihood security. CCAs that deserve such support can be determined on the basis of criteria that are developed by communities, NGOs, and official agencies, keeping in mind the key motivating factors behind the creation of such CCAs in the first place. Such measures could include legal, institutional, technical, social, and/or financial backing. Part of this exercise should be aimed at identifying, demarcating and declaring appropriate CCAs under relevant legislation.

Justification: As in the case of PAs, many CCAs are under serious threat, often from forces which communities are not able to deal with on their own. Action to tackle the threats (which would often require outside help) is urgently needed.

Suggested Responsibility: MoEF and state governments, research institutions like IISc, JNU, GBPIHED, NEHU, KFRI, IIFM, CPRF, RANWA, Kalpavriksh etc. at the request of communities and associated groups.

Time Frame: 2 years for an initial set of representative and critically important sites; 10 years for the rest.

Steps:

- i. MoEF to set up a team of experts and activists from institutions and NGOs, to list known CCAs (for preliminary list, *see Annexure 11*), and assist communities in carrying out the status assessment;
- ii. The team to identify, in consultation with the respective communities, an initial set of CCAs that can be declared as Community Reserves under the Wildlife (Amendment) Act, 2002, (as recommended in NWAP, and with appropriate interpretations or modifications of the current text of the Act to facilitate community decision-making processes, diverse institutional structures, and inclusion of government lands, rather than imposing standard rules on them and allowing them only on non-governmental land), as Heritage Sites under the Biodiversity Act, 2002 (also appropriate rules empowering the community), as Ecologically Sensitive Areas under EPA (*see Box 6.17*), as Village Forests under IFA, or as community areas under any other relevant law including PESA.
- iii. State governments to notify these sites in a consultative manner with the local communities, experts and NGOs. For every such site, it must be ensured that declaration takes place only on the request of or after the explicit consent of the communities concerned, that the existing institutional structure that is managing the CCA is not disturbed or replaced except where necessary to ensure equity, that there is no decision-making intervention or imposition of officials in a decision-making position by the government, and that the legal status of the land is not considered a barrier to extension of CCA status. This requires that a community-centred set of rules be built into each of the above laws, with appropriate flexibility to allow for site-specific variations in management and extension of CCAs to all kinds of lands; on no account should there be an imposition of a centralised, single-model structure on areas to be notified under these laws;
- iv. Initiate support measures, including administrative, financial and technical support, and a range of social and economic incentives for continued conservation (*see Strategy 7.1.2.3, Action 2*), based on the status assessment at each site (including those to be notified under any of the above-mentioned laws);
- v. Based on experience of the first set of CCAs that are legally notified or given appropriate support, extend such measures to other CCAs; and support these as well as non-notified CCAs through other programmes such as watershed development schemes;
- vi. Support related cultural activities, such as festivals, displays and exhibits, and youth competitions; give recognition to folk healers, farmers, conservers, and so on;
- vii. Facilitate a continuous process of information and personnel exchange, and other networking amongst CCAs;



- viii. Emphasise the revival of customary practices and laws, and encourage traditional modes of community learning and participation, with appropriate emphasis on women and other underprivileged sections;
- ix. Learn and disseminate lessons from various kinds of CCAs, including those initiated by communities themselves as well as those initiated by government agencies (e.g. People's Protected Areas in Madhya Pradesh and Chhattisgarh) or NGOs;
- x. Advocate the recognition of and support for CCAs in global agreements and databases relevant to biodiversity, e.g. the CBD forums, IUCN/World Commission on Protected Areas, UNESCO, and others (*see also Section 7.1.11*).

3. Protect, Revive, and Revitalise Sacred Sites

(See also *Culture and Biodiversity Thematic BSAP*).

Consolidate the documentation of, and provide strategic support to, sacred sites, to enable their continued or renewed conservation by communities. Sacred sites that are 'hotspecks', and therefore very significant from the biodiversity point of view, could be given special focus.

Suggested Responsibility: Community institutions and people's groups, facilitated and supported by MoEF, MoTA, and relevant state government agencies (Environment/Forests/Culture/Tribal welfare departments), in association with Forest Survey of India, Anthropological Survey of India, ZSI and BSI, Indira Gandhi Rashtriya Manav Sangrahalaya, IIFM, WII, SACON, BNHS, CPREEC, WWF-I, CEE, Indian Statistical Institute, IISc, GBPHED, NEHU, KFRI, CPRF, IGRMS, JNU, RANWA, BVEERI, regional associations such as the North-East Council, appropriate religious institutions, and others.

Time Frame: Two years for the inventory, and other actions ongoing.

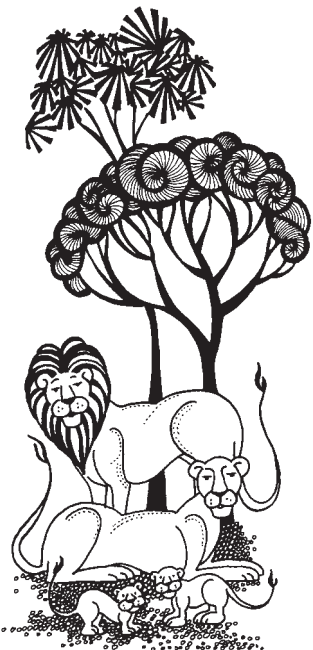
Steps:

- i. Prepare a comprehensive inventory of existing sacred sites (including groves, tanks/ponds, grasslands, coastal/mangrove areas, riverine stretches and landscapes), consolidating and building on several existing inventories; identify sacred sites that are biodiversity 'hotspecks'.
- ii. Sacred sites should also be mapped (and integrated into the proposed National Biodiversity Conservation Atlas, *see Strategy 7.1.1.1, Action 2*), studied for their biodiversity and cultural/livelihood significance, and the threats facing them.
- iii. MoEF to consider producing a strategy or policy document on sacred sites, building on the proposed policy by CPR Environment Education Centre and other groups.
- iv. Channelise strategic support to sacred sites, through appropriate community institutions, with facilitation by locally active NGOs, institutions and government departments.
- v. Provide legal protection to the sites, as appropriate, and if approved by the concerned communities.

4. Expand the Network of CCAs (Including in 'Hotspot' Areas and to Cover 'Hotspecks')

Based on the surveys mentioned in the Actions above, and on recommendations made in various action plans under NBSAP (*see Box 7.1.2.2*), facilitate the creation of new CCAs (other than sacred sites that are not contained within larger CCAs, for which see *Action 3* above). This should include the re-designation of some existing PAs where considered suitable, the conversion of RFs and PFs and JFM/CFM sites where appropriate, and the inclusion of marine/coastal areas and other common lands which have current or potential conservation value and can be managed by communities. Efforts should be made to achieve representative coverage of biogeographic, agro-ecological and cultural regions of India, including sites within biodiversity 'hotspot' regions. Particular attention could also be on 'hotspecks', areas that are small in size but rich or significant from biodiversity point of view.

Justification: It is not possible for the government to protect more than a fraction of the vast land and water areas of conservation value in India. Protection becomes possible only if conducive conditions are created for communities to start managing them. In places where communities have shown the capacity and willingness to do this, new CCAs should be encouraged and supported.



Suggested Responsibility: Community institutions and their networks, on their own or with support from relevant state and central government agencies, NGOs, PRIs, institutions, outside individuals, etc.

Time Frame: 5 years to achieve representative coverage, or to cover areas that are ready for declaration under the legislations mentioned in Action 3 of this section; ongoing for other areas.

Steps:

- i. Facilitate communities and community-based organisations to identify gaps in the network of CCAs, and the potential to plug these gaps through creation of new CCAs or through strengthening existing ones;
- ii. Arrange exchange visits of people from the new areas to established CCAs, to learn from their experiences;
- iii. Consider a range of incentives to encourage such a process;
- iv. Regularly monitor the spread of the CCA network, and its efficacy in conservation.

Box 7.1.2.2 Community Conserved Areas

(Recommendations from various BSAPs)

States

The **Chhattisgarh State BSAP** has proposed specific actions to rejuvenate the traditional village-level institutions and mechanisms for natural resource management especially of CPRs; it has cited its People's Protected Area initiative as an example.

The **Mizoram State BSAP** has recommended the revival and strengthening of the traditional system of village safety, supply and bamboo reserves.

The identification of CCAs, understanding the motivational factors in communities, and motivating other communities to take up similar practices has been proposed in the **Punjab State BSAP**.

The **Rajasthan State BSAP**, as part of its overall strategies for Protected Areas, has presented the need to 'develop policy measures and incentives for establishment of private and community protected areas in the state and their legal recognition and support'.

The creation of a network of community and conservation reserves has been suggested in the **Uttaranchal State BSAP**.

The **Gujarat State BSAP** recommends community-based wetland conservation, and incentives for wildlife conservation (e.g. Sarus crane nests) on private and community lands; the **Community Conserved Areas (CCAs) in Gujarat Sub-thematic Review** has listed a series of measures to encourage such areas.

Ecoregions

The **Aravalli Ecoregional BSAP** has recommended 'provision for declaring community lands as sanctuaries if the local community so desires, without infringing the traditional rights over the area.'

The establishment of Community Managed Conservation Sites (CMCS) has been suggested in the **Central Forest Belt Ecoregional BSAP**.

The **West Himalaya Ecoregional BSAP** has recommended that the 'time-tested and unique institution of Van Panchayat of Uttaranchal needs to be improved and extended to other states of the Western Himalaya.'

The **North-East Ecoregional BSAP** recommends the conservation of village/community forests, through a complete inventory of all types of community forests in all the 8 states of the region, regeneration of selected village supply and safety forests of Mizoram, establishment of community forest regeneration models using the native species in an attempt to regenerate degraded forests, involvement of traditional institutions, and capacity-building amongst communities.

Sub-state Sites

The **Arvari Sub-state Site BSAP** proposes community initiatives through capacity-building of the people's groups or individuals for sustainable natural resource management (including revival of water and bio-resources).

Legal support to community driven regeneration and restoration of mangrove forests, preventing diversion for any developmental or industrial needs, has been proposed in the **Kachchh Sub-state Site BSAP**.

5. Assess the Experience of CCAs for Lessons to be Applied to PAs, and Vice versa

Justification: CCAs and official PAs have their respective strengths and weaknesses, and a sharing of experiences would help greatly in synergising the strengths and tackling the weaknesses.

Suggested Responsibility: The teams mentioned at various levels in Step (iv) below.

Time Frame: 5 years

Steps:

- i. Analyse the experiences of managing CCAs, and learn lessons from these for application to officially designated or government-managed PAs, especially to aid in moving towards participatory or joint management (see Strategy 7.1.2.1, Action 5).
- ii. Also apply lessons, especially for wildlife and habitat management, from PAs to CCAs. In so doing, build on the learning already developed by organisations working with/on CCAs.
- iii. Facilitate exchange visits of personnel between CCAs and PAs. Provide recognition to CCA managers as 'honorary wildlife wardens' for nearby PAs/ districts.
- iv. At national level, MoEF or National Board for Wildlife to set up an expert team, consisting of members experienced in official PAs and in CCAs; at local levels, joint teams of PA officials and community representatives, with help from local NGOs.

6. Facilitate a National CCA Network

Encourage the creation of a national CCA system and network, which can help to link various CCA institutions, facilitate exchange visits, generate support, collectively lobby and resist threats, etc.

Justification: Most CCAs today are scattered, isolated initiatives. Networking would greatly strengthen them.

Suggested Responsibility: Community institutions from key CCAs, with help from relevant NGOs and government agencies.

Time Frame: Initiation within one year.

Steps:

- i. Review the recommendations of a national workshop on CCAs organized by Kalpavriksh and IIFM (2002), in particular related to networking;
- ii. MoEF to facilitate through an appropriate community institution and with help of NGOs like Kalpavriksh, various networking activities such as information exchange, newsletters (in various languages), regional meetings, and exchange visits among CCAs.

7.1.2.3 Strategy: Strengthen Conservation Outside PAs and CCAs, Across the Entire Rural Landscape/Waterscape

(Link to the overall context of a landscape and waterscape approach; see Section 7.0)

Actions

1. Strengthen and Encourage Community-Based Species Conservation

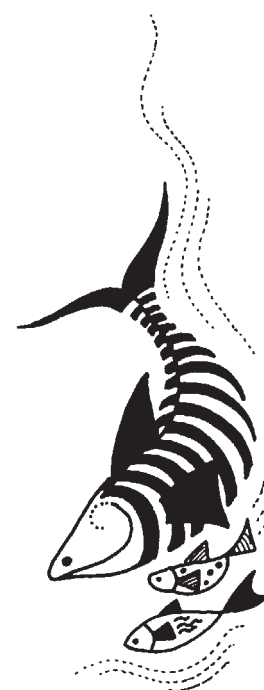
Document, strengthen, and provide further incentives such as recognition, reward, publicity etc., for the protection of species considered sacred or important by communities (or simply tolerated) at levels that ensure viable populations. This includes ficus and other tree species, sacred plants other than trees, ungulates and primates, and other animals (other details as in other Actions in this section).

2. Provide a Range of Incentives for Community-Based Conservation Across the Landscape/Waterscape

Evolve an action plan to provide a series of incentives such as recognition, reward, publicity etc., and benefit-sharing measures to encourage local community members and other citizens to participate in wildlife conservation (in and outside PAs and other conservation areas), including:

- Recognition and encouragement to traditional practices of restrained resource use and abstinence, which help in conservation;
- Rewards and public honours for commendable work in conservation or in harmonising livelihood and wildlife conservation objectives; incentives (as appropriate, and not necessarily financial) to protect wildlife on cultivated lands, pastures, village tanks and other waterbodies, and other human-dominated ecosystems (both private and common);
- Biomass and water resource rights for *bonafide* use, within the ecological limits of the area, especially for traditional communities who voluntarily maintain lifestyles in harmony with nature;
- Compensation or remuneration for ecosystem benefits where natural sites are actively conserved/managed by communities;
- Financial, legal and other assistance for community conserved species;
- Employment in local conservation- and development-related activities; (as recommended by the 9th 5-year Plan document, for landless and poor people)
- First charge on benefits from the buffer zone, and on biomass removed for management purposes from PAs (as per Section 29 of Wild Life (Protection) Amendment Act 2002);
- Ecologically sound developmental activities, as far as possible in consonance with local traditions and cultural values (in education, health, etc.);
- Share from tourism revenues and other sources (see also Action 4 below);
- Financial/technical support for conservation and sustainable resource use practices or for alternatives to destructive resource use practices;
- Empowerment to enable participation in local decision-making including in relation to PAs, e.g. recognition as honorary wildlife warden/ committee member for district;
- Returns from intellectual contributions such as new discoveries of taxa, information about the uses of various species, etc. (see Section 7.1.5).

Justification: Given the high level of threats faced by biodiversity everywhere, and that economic and political motivations are increasingly weakening traditional attitudes of conservation and tolerance, there is a need for a range of positive incentives for people to regain a stake in conservation. It may be noted that such incentive measures are mandated by the Convention on Biological Diversity, to which India is a party. They were also recommended by the MoEF for inclusion in the 9th Plan: 'In case of local community organisations, assistance will be in the form of incentives to ensure that conservation effort being made by them is not only supported but further strengthened as in the case of sacred groves and protection of blackbuck by the Bishnois in Rajasthan, etc.' (Report of the Working Group on Wildlife for the IX Plan (1997-2002), MoEF, May 1996, p. 19). Finally, they are also mandated by the National Wildlife Action Plan 2002.



Suggested Responsibility: State government (wildlife and developmental agencies), MoEF, relevant NGOs and Panchayat institutions along with the boards and committees under the Biological Diversity Act, 2002.

Ongoing Relevant GOI Schemes/Programmes:

MoEF's Conservation of Natural Resources Programme, and, under MoEF's Award Fellowships and Awards programme, the Indira Gandhi Paryavaran Puraskar (IGPP), Mahavriksha Puraskar, Rajiv Gandhi National Wildlife Conservation, Amrita Devi Wildlife Protection Award, etc.

Time Frame: 3+ years for high-priority sites and ongoing for these and the rest.

3. Conserve and Sustainably Manage Critical Ecosystems Outside the PA and CCA Network

Extend conservation activities to the whole range of ecosystems and species assemblages, outside the PA and CCA networks. This would include coral reefs, mangroves, wetlands, deserts, grasslands, mountain ecosystems, and other often neglected ecosystems. In particular, use appropriate legal and institutional means, which recognise and respect the livelihood rights and needs of local communities for conserving these; use especially the provision of Ecologically Sensitive Areas under the EPA (see Box 6.18), as has already been done for a number of sites in India.

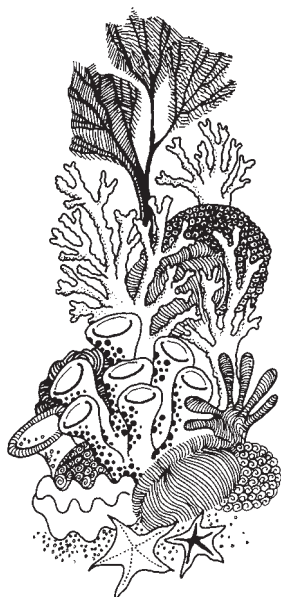
Justification: Considerable biodiversity exists, and will continue to exist, outside the PA and CCA network. Vast areas of natural ecosystems – such as the oceans and mountains and deserts – need conservation strategies that employ new tools and techniques.

Suggested Responsibility: MoEF with relevant departments at state level, with central involvement of local community institutions, and NGOs and institutions such as FRLHT, BNHS, SACON, WWF, WII, IISc etc.; for marine/coastal areas, organizations of fisherfolk such as the National Fishworkers' Forum with help from groups like International Collective in Support of Fishworkers (ICSF).

Time Frame: 5 years.

Steps:

- i. Identify all ecologically critical sites outside the PA and CCA networks, which require conservation inputs; in particular focus on representative sites within the ecoregions taken up under NBSAP (as listed in Chapter 1), and on relatively neglected areas like coasts (see Box 7.1.2.3) and rock outcrops (see Box 7.1.2.4);
- ii. Assess the lessons of managing such sites that are already covered under conservation activities, including as part of the Fragile Ecosystems project of MoEF, the Ecologically Sensitive Zone notifications under EPA, Ramsar and World Heritage sites that may not be PAs, and others such as the Medicinal Plants Conservation Areas (MPCAs) established by state Forest Departments and FRLHT;
- iii. Prepare case studies and guidelines embodying these lessons, for the use of local Biodiversity Management Committees envisaged in the Biological Diversity Act, 2002 or other relevant community institutions;
- iv. Extend these lessons to other sites, for which management plans should be prepared in full consultation with local communities, NGOs, and independent experts, beginning with areas already under active consideration, such as the Sahyadri Ecologically Sensitive Area proposed by a number of NGOs (see Chapter 6.1.2.2, and *Western Ghats Ecoregional BSAP*);
- v. Take strong steps to counter the threats that these areas face; in particular, build into appropriate legal and planning documents the need for these areas to be off-limits to destructive 'development' projects such as mining, large dams, industries, big ports, commercial non-community-based tourism, and others (e.g. the National Conservation Strategy, GOI, mandates 'Restriction on mining and quarrying activities in sensitive areas such as hill slopes, areas of natural springs and areas rich in biological diversity'; see also strategies/actions on development sectors, including water development (7.1.7.2), energy and infrastructure (7.1.7.3), mining (7.1.7.4), power stations (Box 7.1.7.1), paper mills (Box 7.1.10.1).
- vi. Consider, and if felt necessary, move towards, the setting up of specialised agencies, charged with conservation and livelihood security as their prime mandates for marine/coastal areas, and for grasslands.



Box 7.1.2.3 Protecting the Coast

(See Strategy 7.1.2.3, Action 3)

One of the most urgent steps to protect India's coasts is to complete the Coastal Zone Management Plans, as per the conditions laid out in the CRZ Notification as well as the directions of the MoEF specified in their letter dated 27th September 1996. The CRZ Notification was issued under the Environment Protection Act, 1986 (see Section 6.1.1.2). It is also important that the respective State Governments take into cognizance the relevant orders of the Supreme Court, such as in Writ Petition (Civil) 664 of 1993, which directed all States to file their complete CZMPs by 30.6.1996.

In addition, the Central Government has constituted National and State Coastal Zone Management Authorities (see Box 6.58), but in almost all cases, these have no (or minimal) non-governmental representation. The independent function they are meant to perform has also not become a reality. The CZMAs (both at state and national level) need reconstitution with inclusion of NGOs and independent experts. The presence of the Coastal Zone Management Authority needs to be extended to the district level to enable closer monitoring and planning for coastal conservation. At the district level there needs to be an involvement of coastal communities. There should be no overlap of functions with that of the State CZMAs in the constitution of these extension units.

Additional steps needed include:

1. Integrated management of the coastal zone

At present, the extent of the coastal zone is variously defined and consequently managed by multiple agencies. Ecologically, the coastal zone is defined as extending up to the supralittoral zone. According to LOICZ (Land-Ocean Interaction in the Coastal Zone programme), it is 200 m elevation inland from the High Tide Line. According to the CRZ Notification under the Environment (Protection) Act, it is 500 m from the high tide line. All these definitions have been framed to achieve particular objectives, but have not necessarily been set keeping in mind conservation of biodiversity.

Various Government departments such as the Public Works Department, Port Department, Department of Mines and Geology, Forest Department, Fisheries Department, Department of Ocean Development, Coast Guard etc. control various features on the coast. There needs to be greater interaction and awareness created in all these departments on aspects such as the responsibility for conserving ecologically sensitive areas within the CRZ, as well as the permissions given for particular activities within the said zones.

2. Remove encroachments and intensive commercial aquaculture

Identify encroachments and incursions made for intensive commercial aquaculture, and demolish them as per Supreme Court orders (see Box 6.19). The Government of Karnataka was prompted under High Court orders to constitute a Committee, to investigate such violations of the CRZ. Similar exercises should be undertaken by the other CZMAs, with full participation of NGOs in the exercise.

3. Control of beach and sea erosion

Various unsustainable developmental activities on the coast and the global increase in sea level have contributed to sea erosion at many places. The current practice of indiscriminately constructing sea walls. It alters long-shore currents and modifies coastal geomorphology, causes habitat loss in many places, fragments some habitats and prevents access to the beach and the estuaries needed by marine organisms for breeding and rearing of their young (*West Coast Ecoregional BSAP*). Almost all participants in meetings and hearings conducted during the West Coast Ecoregional process under the NBSAP recommended that the practice of constructing sea walls be stopped forthwith. Alternative technologies, such as the eco-friendly method of controlling erosion by replanting sand dune vegetation and mangroves where they existed earlier, should be adopted everywhere.

Specific action points:

- i. Evaluation of existing alternative technologies other than sea wall construction, and development of newer technologies for control of sea erosion.
- ii. Promotion of use of natural vegetation (sand binders and sand dune flora) for prevention of shore erosion.
- iii. Earthen bunds should once again be encouraged wherever possible, and fringing mangroves propagated along the bunds in low-lying agriculture and aquaculture (traditional) farms, fields and *Khar* lands.

iv. Control on sand mining in coastal areas.

4. Enforce and strengthen regulations

It is essential that the provisions of the CRZ and the Coastal Zone Management Plans of states and UTs are not systematically diluted to accommodate interests of activities that are inimical to biodiversity conservation (as has happened in the past). All environmentally inimical amendments to the CRZ Notification (*see Box 6.65*) should be rescinded. The notification needs to be strengthened, keeping in mind the development needs of the fishing communities and the promotion of coastal ecological features.

The Integrated Coastal Zone Management Training Centres at Jadavpur University (West Bengal) and Anna University (Chennai), should train coastal community members and officials of relevant departments regarding the above ecological and socio-economic issues.

Box 7.1.2.4 Protecting Rock Outcrops

Rocky outcrops of various kinds are highly specialised ecosystems, with unique biodiversity and many endemic species (*see Box 4.1*). They have received almost no conservation attention in India.

Conservation of rock outcrops requires the following actions:

1. Define rock outcrops as distinct habitats/ecosystems;
2. Provide special budget provisions for research and conservation action, on the basis of the fact that they are seriously neglected and threatened.
3. Develop a multidisciplinary research approach involving geologists, geographers, naturalists and social scientists, including experts from local communities, for increasing knowledge about rock outcrops in India to the necessary standards.
4. Develop management strategies for the sustainable use of rock outcrops (including restoration and rehabilitation measures).
5. Create awareness in the scientific community, policy makers and amateur naturalists as well as local communities regarding the biological and cultural importance of rock outcrops.
6. Consider various possibilities for legal or other effective means of conserving these ecosystems.

(Adapted from Porembski and Watve 2002)

4. Integrate Biodiversity into Organised Bioresource Use Activities, e.g. Commercial Forestry and JFM, NTFP, Fisheries, Plantations, Medicinal Plants, Marine Bioresource Use, and Coastal Management Plans
(*See Sections 7.1.4.2 and 7.1.4.3 for details*).

5. Conserve Biodiversity in Areas Under the Jurisdiction of the Armed Forces

Conserve biodiversity in areas under the jurisdiction of the Army, Navy, Air Force, para-military forces and Coast Guard. An Armed Forces' Biodiversity Conservation Plan could be formulated and integrated into relevant central and state plans and schemes, with appropriate directions and guidelines for different kinds of ecological contexts and various kinds of armed forces' activities.

Justification: Areas under the control of the armed forces are often in ecologically rich regions, and contain significant levels of biodiversity due to restricted activity (though the greater impact of the activities of the armed forces is destructive to biodiversity). Many individual bases are carrying out conservation activities due to the interest shown by the officers in charge, but there is no systematic, across-the-board policy or plan for such activities to be taken up at all sites.

Suggested Responsibility: Ministry of Defence with MoEF, through officers in charge of each base, and with the collaboration of relevant NGOs and community institutions from settlements in/around such bases.

Time Frame: Rapid assessment of armed forces' bases, and Action Plan in two years; implementation ongoing thereafter.

Steps:

- i. MoD and MoEF to commission experts to do a rapid assessment of the biodiversity significance of each major base, the impacts of armed forces' activities in these areas, the potential for conservation, and the possible conservation activities that the forces could engage in outside these bases as well (see Box 7.1.2.5 on recommendations from various states and sub-state sites under NBSAP);
- ii. MoD and MoEF to develop an Armed Forces Biodiversity Conservation Action Plan (AFBCAP), in consultation with relevant NGOs and conservation institutions, building on work already done in individual bases (e.g. the campus of the National Defence Academy in Pune; see Western Ghats Ecoregional BSAP), and by organisations such as WWF-I and BNHS in collaboration with the forces;
- iii. MoD to request integration of elements of the AFBCAP into relevant central/state plans and schemes, and issue instructions and guidelines to all bases to follow the AFBCAP;
- iv. Base officers to produce publicly accessible reports on implementation;
- v. MoD to set up a Biodiversity Conservation Task Force to guide the above, and to conduct periodic reviews to assess implementation of the AFBCAP.

Box 7.1.2.5 Using the Armed Forces for Conservation

(Extracts from various BSAPs)

1. Support from the defence services for joint patrolling

- The **Sikkim State BSAP** recommends joint patrolling by the Forest Department and the armed forces for the high altitude areas of North and East Sikkim.
- The **Andaman and Nicobar State BSAP** recommends joint patrolling by the Forest Department, Police, Coast Guard and the Navy in the management of protected areas.
- The **Kachchh Sub-state Site BSAP** recommends joint patrolling with local community representatives to check mechanized trawler fishing in creek areas.

2. Support in bio-monitoring

- The **Sikkim State BSAP** recommends that the army assist the Forest Department and CEE in monitoring in the remote high-altitude areas of North and East Sikkim during their regular Long Range Patrolling (LRP), as only the army has the requisite infrastructure and a continuous presence.
- The **Kachchh Sub-state BSAP** recommends that the defence services help in collecting basic spatio-temporal information on flora and fauna from restricted but biodiversity rich areas to help in monitoring the health of ecological systems, e.g. distant mangrove areas in Kori and Sir creeks, Flamingo City and other bays in the Rann of Kachchh.
- The **Ladakh Sub-state BSAP** recommends that the armed forces participate in surveys in remote/border areas with regular military/paramilitary presence, and which are prime habitats of some of the most threatened species (Tibetan gazelle, Tibetan antelope, Wild yak, Blacknecked crane).

3. Sensitizing the armed forces

- The **Sikkim, Nagaland, Kachchh, Arunachal and Ladakh State/Sub-state BSAPs** recommend sensitizing the armed forces towards biodiversity conservation through special training modules and simple booklets on conservation.

4. Support in afforestation activities

- The **Kachchh Sub-state Site BSAP** recommends that the armed forces be involved in propagating mangroves in the interior areas of creeks and tidal marshes.
- The **Nagaland State BSAP** recommends that the armed forces be involved in afforestation in different units during peace time.

6. Conserve Biodiversity in Areas Under the Corporate Sector

Conserve the range of biodiversity found in areas controlled by the corporate sector, such as industrial sites, offices, industrial townships, agro-plantation areas and other areas of operation.

Justification: Considerable biodiversity is still found in the areas controlled by the corporate sector, though the overall impacts of this sector are destructive of biodiversity. This sector needs to be much more proactive in conserving this remaining biodiversity, even while taking measures to reduce the overall negative impact they cause (as laid out elsewhere in this chapter). Its vast resources should be used for this purpose.

Suggested Responsibility: Corporate associations like CII, FICCI, ASSOCHAM, etc. in association with individual corporate houses, with guidance and monitoring by relevant NGOs and institutions.

Time Frame: Ongoing

Steps:

- i. Corporate associations to set up an independent expert group (with involvement of experts from NGOs and government agencies) to assess the biodiversity significance of areas under corporate control, and formulate conservation guidelines for corporate houses to follow; the draft guidelines should be publicly accessible for comments and inputs; the guidelines to build on lessons learnt by existing initiatives (such as those listed in Section 6.1.2 and other sections of Chapter 6);
- ii. Corporate associations to circulate these guidelines to all members;
- iii. The expert group to monitor the implementation of the guidelines, and bring out a periodic publicly accessible report on the progress made;
- iv. An award scheme to be started for corporate houses that show exemplary initiative in conserving biodiversity in all their sites and operations;
- v. An incentive scheme to be initiated by the corporate associations and others, to be provided to individual corporate sector sites for special conservation purposes, as also in situations where the opportunity costs of conservation may need to be compensated (e.g. incentives to coffee/tea/other agricultural and agroforestry plantations that are in economic difficulties, where the incentives could help convert or retain their estates as biodiversity conservation)

7. Conserve Biodiversity in Areas Controlled by Religious/Spiritual Institutions

Conserve biodiversity found in the territories owned or controlled by spiritual/religious institutions, including groves, tanks, gardens, pilgrimage spots etc. Ensure that such activities do not have a communal or fundamentalist orientation.

Justification: As in the case of the armed forces, and the corporate sector, the significant biodiversity found in many spiritual/religious institutional areas is often neglected or destroyed. There needs to be much greater consciousness amongst such institutions for conservation of such diversity.

Suggested Responsibility: Spiritual/religious bodies and associations, with guidance from MoEF, Ministry of Culture, relevant NGOs and local community experts.

Steps: As in Action 6: study/document, issue guidance, and monitor progress.

8. Conserve Biodiversity in Educational and Research Institutional Areas, Including Agricultural University Campuses, and Set Up Demonstration Centres for Conservation

(Other details as in Actions 6&7, suitably modified.)

9. Conserve Biodiversity in Other Government Lands, Such as Railway Line Strips and Colonies

(Other details as in Actions 6&7, suitably modified.)



7.1.2.4 Strategy: Conserve and Rehabilitate Threatened, Endemic and Other Species of Conservation Significance

Actions

1. Develop Conservation Plans and Projects for Each of the Seriously Threatened, Prioritised Endemic and Other Species of Conservation Significance, With Special Attention to Hitherto Neglected Species/Taxa

Develop and implement conservation plans, with appropriate legal backing, for species that are threatened, endemic, or in other ways of critical conservation significance (from a taxonomic, ecological, or socio-economic point of view). Such plans would include an assessment of current status and threats, measures needed to protect the species in its entire range, and, if necessary, measures for reintroduction and/or enhancement of populations (see also *Action 4* in this section). Build on ongoing governmental and non-governmental work for this. Take steps to ensure the population and genetic viability of species, through protecting the largest (core/source) and satellite (marginal/sink) populations, securing or reviving corridors for movement and gene flow, re-introducing species into viable habitats, translocating species to secure habitats, and other such measures.

Ensure that the long-term genetic effects of inbreeding due to small and isolated populations in PAs are dealt with. This may include induced movement of individual animals to ensure gene flow between small populations, or the establishment and protection of corridors for the natural movement of animals. Where natural corridors already exist, they need to be identified and mapped and provided high priority in protection. In case habitats have been fragmented, efforts should be undertaken to establish corridors. Due care should be taken so that these efforts use natural means like planting of indigenous vegetation and increased protection rather than civil engineering solutions. The measures should also have the full involvement of local communities wherever relevant, and should ensure that their livelihood security is enhanced in the process. Finally, there needs to be a strong research, monitoring and evaluation component, which will determine further steps and measures.

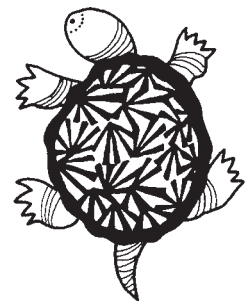
Justification: Conservation in India has lacked a systematic, species-wise approach, with the exception of some 'glamorous' mammals and birds. All centrally sponsored species-focused projects have been only for such species. General provisions for protection of threatened species in the Wild Life (Protection) Act, 1972, have been less than fully effective as they have not been concretised into an action plan for each individual species (with some exceptions). Indeed the Act does not actually provide protection to a species in its entire range or from all the threats it faces, e.g. fragmentation, epidemics, degradation of areas outside protected areas, etc. Endemic species have been neglected unless they are part of the highly visible threatened species list. 'Smaller' fauna (fish and other aquatic animals, amphibians and reptiles, invertebrates), non-tree or non-flowering plants, and micro-organisms have been particularly neglected.

Suggested Responsibility: The National Board for Wildlife, through a consortium of key wildlife research and action institutions, national flora/fauna/micro-organism surveys, in association with state wildlife advisory boards, regional and local institutions, NGOs, and community experts.

Time Frame: 3 years to cover priority species/taxa; the remaining within 10 years.

Steps:

- i. Identify neglected and priority species/taxa from amongst the full list of threatened and endemic species/taxa, using existing processes such as the CAMP exercises, and documents such as the prioritised lists produced under the Biodiversity Conservation and Prioritisation Project (see Chapter 6.1.1.2);
- ii. Identify other critically important species/taxa, such as wild relatives of important crops and livestock, rare medicinal plants, etc.; initiate collaboration between related institutions such as BSI and NBPGR, ZSI and NBAGR, for this purpose;
- iii. Set up teams comprising relevant experts to assess the status of each of these species and formulate Species Conservation Action Plans through a participatory process; the plans should focus on tackling key threats in the entire range of the species/taxa (for an example, see *Box 7.1.2.6*);



- iv. Advocate the acceptance of these action plans by appropriate governmental and non-governmental agencies, especially those who own/control the lands/waters which are critical to the survival of these species/taxa;
- v. Provide the necessary technical, financial, humanpower and other support to implement the plans, and give them legal backing through the Wild Life (Protection) Amendment Act, 2002, the Biological Diversity Act, 2002, or other relevant legislation.

Box 7.1.2.6 Indian Crocodiles Action Plan

At the First Western Asia Regional Conference of the IUCN/SSC Crocodile Specialist Group, held at Gwalior (Madhya Pradesh), 5-7 June, 1997, the following action plan was devised for Indian crocodylian species:

1. Constitution of a Technical Committee on Crocodile Conservation by the Government of India;
2. Surveys of wild populations and potential restocking sites, for all three species (salt-water crocodile, freshwater crocodile, and gharial); and research on a number of other priority aspects;
3. Creating widespread awareness amongst human communities around crocodile habitats, including of their beneficial role in ecosystems;
4. Development of skills amongst forest and wildlife staff, for research, captive and wild management, nuisance crocodile control techniques, and other aspects;
5. Regional cooperation, including trans-boundary conservation;
6. Fund-raising for all the above.

Source: MCBT/CSG 1998

2. Update the Schedules of the Wild Life (Protection) Act, to Include All Threatened and Endemic Species, and Species on Which They are Dependent

Provide legal protection to threatened and endemic species by including all of them in the relevant schedules of the Wild Life (Protection) Act (as amended in 2002), and authorising the relevant species-wise actions plans (*see Action 1 in this section*). Provide some degree of protection to species that are not themselves threatened, but are critical for the survival of threatened/endemic species, such as prey species of threatened predators, or host plant species of threatened birds and invertebrates. Ensure that all species listed in CITES are covered in the WLPA, or consider a separate legislation to enforce India's obligations under CITES.

Justification: While there have been periodic revisions of the WLPA schedules, experts have pointed out a number of omissions (and other shortcomings). Fish, for instance, are completely missing. These lacunae need to be urgently filled.

Suggested Responsibility: MoEF, on the advice of the National Board for Wildlife, and other institutions/organisations mentioned in *Action 1* of this section.

Time Frame: One year after *Action 1* is completed, in the case of species whose status is as yet uncertain; immediate in the case of species already known to be threatened/endemic but which do not figure in the WLPA schedules.

3. Step Up Anti-Poaching and Anti-Trade Measures

Strengthen measures to control and eliminate poaching and theft, as also illegal wildlife trade, building on recommendations already made on this by past committees and expert groups set up by MoEF and the courts. This could be through enhanced intelligence-gathering and patrolling measures, including (or especially) by local communities and other citizens; and by tackling the consumer demand and the markets dealing with such articles. Tackle, through consultations with communities, the continuing practice of mass hunts in various parts of the country.

Justification: Instances of poaching of certain species have been on the increase, and in many places it has been difficult for even the PA authorities to control this. There is a need for considerably enhancing anti-poaching measures, innovative measures that involve citizens, consumer education, crackdown on wildlife markets, punishment to high-profile consumers and traders, etc.

Suggested Responsibility: State Forest Departments, local communities, police, other law enforcement agencies, and conservation NGOs, assisted by MoEF.

Time Frame: Immediate and ongoing.

Steps:

- i. Set up a dedicated anti-poaching and anti-trade unit at MoEF and in each state Forest/Wildlife Department (where it does not already exist); these should comprise officials, NGOs and community representatives;
- ii. Appoint joint official-citizens' patrol teams in and around protected areas, and in other sensitive areas outside the PA network; provide appropriate powers to PRIs, village-level forest protection and ecodevelopment committees, etc.
- iii. Provide incentives (including rewards and public recognition) to community groups and other citizens' groups for patrolling, reporting, and taking citizens' action against poachers and traders;
- iv. Provide alternative employment to communities that have traditionally hunted or traded in endemic or threatened species; in particular, utilise their skills in various conservation programmes;
- v. Plug loopholes and weaknesses in the legal system for punishing poachers and illegal traders, and make an example of high-profile (including VIP) poachers/traders to deter others;
- vi. Conduct periodic and intensive consultations and participatory research with communities that continue to practice mass hunts in various parts of India, to understand the impacts of these hunts, and where necessary, to persuade them to replace the hunting component with some other activity that could still serve the cultural/social function of these mass events;
- vii. Resolve, with community involvement through the proposed joint management committees (*see Strategy 7.1.2.1, Action 7*), cases of community members that have been improperly charged with poaching, wood theft, or other offences.

Ongoing Relevant GOI Schemes/Programmes:

MoEF: (i) Biosphere Reserves sub-programmes under Conservation of Natural Resources Programme of MoEF, (ii) Development of National Parks and Sanctuaries, Project Tiger, Project Elephant, Eco-development Scheme in and around National Parks and Sanctuaries including Tiger Reserves, and India Eco-development Project, sub-programmes under Conservation of Natural Resources Programme of MoEF.

4. Reintroduce, Translocate, Rehabilitate, and/or Enhance the Populations of, Seriously Threatened Species/Taxa

Where possible and necessary, attempt the revival of seriously threatened species/taxa, through reintroduction or population enhancement into suitable habitats, or translocation from threatened areas to safer ones. Develop a cadre of specialists in this field.

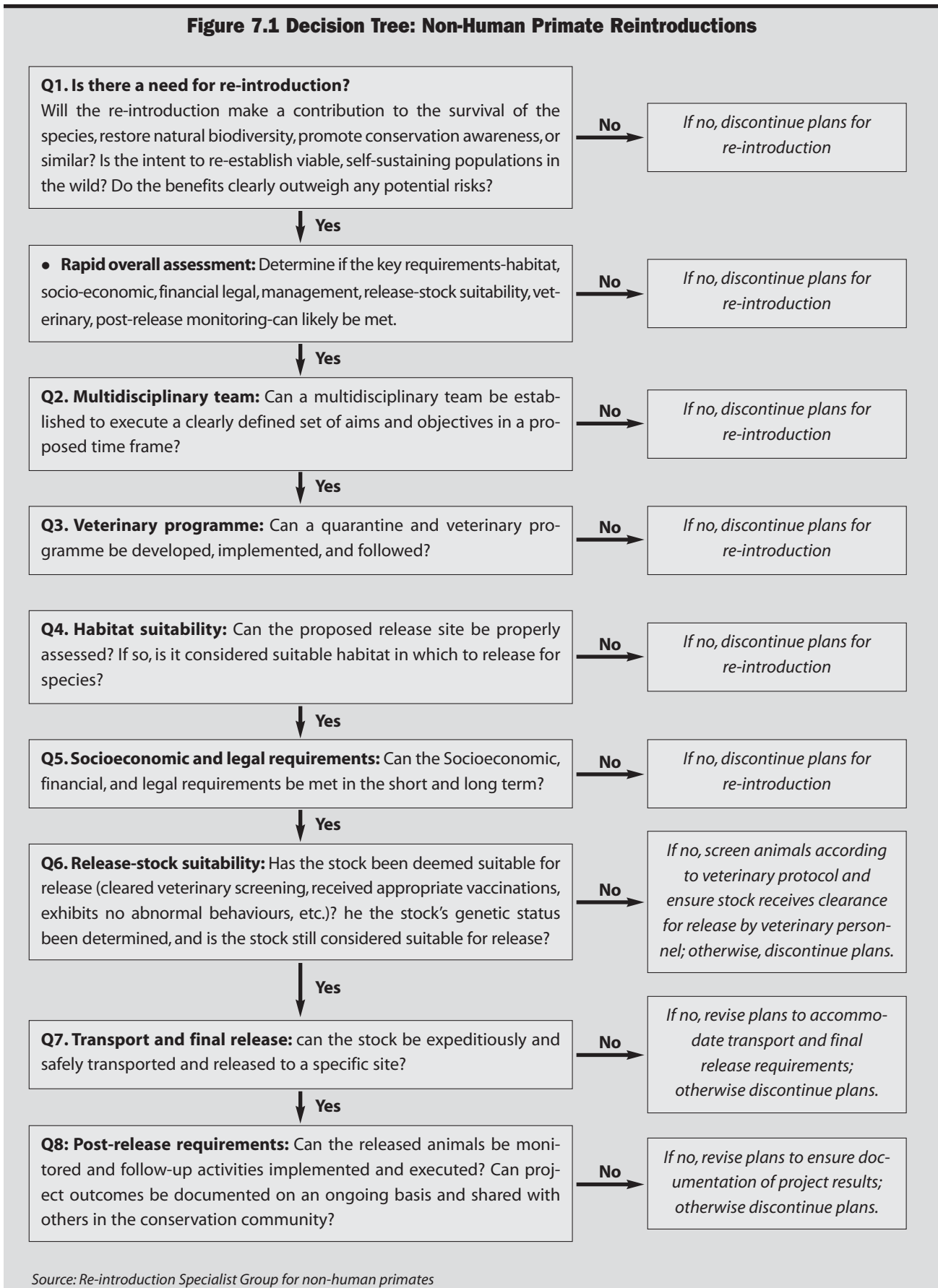
Justification: Habitat loss and fragmentation are amongst the biggest threats to biodiversity. Many populations of threatened species have been badly reduced, fragmented and isolated, resulting in inbreeding with serious long-term consequences, possibly including extinction. Reviving their viability through the above measures is an urgent necessity.

Suggested Responsibility: State Forest Departments, with assistance from MoEF, in collaboration with research and conservation institutions including university departments, community institutions, and NGOs.

Time Frame: Ongoing, with a target to secure the population viability of the most critically threatened species within the next 10 years.



Figure 7.1 Decision Tree: Non-Human Primate Reintroductions



Box 7.1.2.7 Candidate Species for Reintroduction, Enhancement, or Translocation

Some species identified by various experts, which are in need of urgent reintroduction, population enhancement or translocation include the following (this is not meant to be a comprehensive list):

Fauna

Great pied hornbill (Western Ghats)
 Vultures of various species (across India)
 Forest spotted owlet (Maharashtra)
 Lion-tailed macaque (Western Ghats)
 Andaman pig (Andaman and Nicobar Islands)
 Freshwater turtles of various species (across India)
 Hangul deer (from Dachigam National Park, Kashmir, to Himachal Pradesh)
 Brow-antlered deer (from Loktak Lake, Manipur, to Pobitara National Park, Assam)
 Rhinoceros (from Assam to Kishanpur and Katarniaghat Sanctuaries, Uttar Pradesh)
 Hoolock gibbon (Arunachal Pradesh)
 Sea cow *Dugong dugong* (Gulf of Mannar, Andaman and Nicobar Islands)

Flora

Andaman and Nicobar Islands: *Dipterocarpus andamanicus*, *Dysoxylum andamanicum*, *Litsea leiantha*, *Strobilanthes andamanensis*, *Vanilla andamanica*, *Oryza indandamanica*, *Garcinia andamanica*, *Mangifera andamanica*, *Toxocarpus kurzii*, *Canarium manii*, *Strychnos narcondamensis*, *Strychnos andamanensis*

Western Ghats: *Hopea utilis*, *Cyanometra travancorica*, *Humboldtia decurrens*, *Buchanania barbarii*, *Garcinia travancorica*, *Piper hapnium*, *Pogostemmon travancoricus*, *Andrographis rothii*, *Diospyrus barbarii*, *Syzygium beddomii*, *Atuna travancorica*, *Calliandra cynometroides*, *Ceropegia beddomii*, *Humboldts bourdilonii*, *Vernonia recurva*, *Ardisia blatteri*, *Pavetta oblanceolata*, *Arisaema auriculatum*, *Phyllanthus cozhicodianus*, *Syzygium kanarensis*, *Curcuma decipiens*, *Plectanthes parvifolius*, *Amorphophallus mysorensis*, *Oianthus deccanenthus*, *Scilla viridis*, several *Ceropegia* species, *Barlaria sepalosa*, *Achyranthus coynii*, *Cryptocoyne cognata*

Eastern Ghats: *Pimpinella tirupatiensis*, *Brachystelma glabrum*, *Caralluma indica*, *Andrographis beddomii*, *Mimosa angustisiliqua*, *Memecylon lushagtonii*, *Shorea thumbugianii*, *Indicofera barbarii*

Western Himalaya: *Aconitum balconerii*, *Aconitum bolfourii*, *Berberis kumoanensis*, *Berberis lambertii*, *Berberis affinis*, *Meconopsis robusta*, *Cotoneaster garhwalensis*

Eastern Himalaya & North-East India: *Ilex embelioides*, *Cotoneaster khasiensis*, *Dunbaria debilis*, *Mahonia pycnophylla*, *Goniothalamus simonsii*, *Agapetes obovata*, *Impatiens khasiana*, *Agapetes rugosus*, *Capillipedium nagense*, *Cotoneaster negensis*, *Saussurea negensis*, *Swertia lacei*, *Lilium macklineae*, *Agrotis wardii*, *Themeda huttonensis*, *Gleditsia assamica*, *Aconitum lethale*, *Coptis teeta*, *Berberis dasyclada*, *Lobelia mishmica*, *Ilex sikkimensis*, *Flemingia bhutanica*, *Aconitum lewesii*, *Acronema nervosa*, *Cheirostylis whiteana*, *Nepenthes khasiana*

Source: G.S. Rawat, Uppeandra Dhar, Ajith Kumar, R.R. Rao, and Harry Andrews, personal communication 2003

Steps:

- i. Prepare a roster of institutions and individuals who have expertise in plant/animal reintroductions and translocations;
- ii. Identify the most critically threatened species/taxa, and shortlist those where revival is viable; for this, build on prioritised lists prepared under BCPP, those identified in the *Wild Animals Diversity Thematic BSAP*, and other such existing documents (see Box 7.1.2.7 for some examples);
- iii. In the case of reintroductions, use a protocol to establish the viability and features of the process, such as the

- decision tree published by the Re-introduction Specialist Group for non-human primates (see Figure 7.1);
- iv. Also build on the lessons learnt from past and ongoing reintroductions (see Sections 6.1.2 and 6.1.3);
 - v. Prepare revival plans for each of these species, with the help of experts from the above-mentioned roster;
 - vi. Secure the sites, resources and expertise needed for the revival process;
 - vii. Carry out the reintroduction or translocation along with an independent process of monitoring success over periodic intervals.

7.1.2.5 Strategy: Conserve Biodiversity in Urban Areas

(See also Nagpur, Pondicherry, Chandigarh, and Delhi BSAPs, and Urban Biodiversity Sub-thematic Review.)

Justification: Biodiversity in urban areas generally tends to be neglected in biodiversity related programmes. Urban settlements are growing rapidly, putting pressure not only on hinterlands and further away, but on their own internal resources. Indeed, ecological destruction inside the urban area could lead to further dependence on outside areas, as in the case of biomass and water. Simultaneously, it is now well-recognised that considerable biodiversity survives, including in adapted forms, in urban areas. For all these reasons, its conservation is essential.

Actions, Steps, Suggested Responsibilities, and Time Frame			
Actions	Steps	Suggested Responsibility (other than Ministry of Urban Affairs, and MoEF, which are common to all)	Time Frame
1. Assessment: Identify historical and existing biodiversity levels & monitor +/-ve impacts of various actions	A. Compile/document the environmental history of the site: what biodiversity existed in the past, and what changes have taken place B. List, map, describe and monitor bi-annually different ecosystems and species, including their frequency, threats, and management options for each ward and institution; compile existing and new information for each city/town C. Assess impacts of current urban activities on biodiversity within and outside urban limits	Schools, Colleges, Research Institutes, NGOs, Media	2 yrs +
2. Planning: Norms, action proposals for existing and new expansion areas	A. Prepare Integrated Conservation Plan through widespread consultation, along with: <ul style="list-style-type: none"> • Preparation of a base map with the help of satellite imagery/survey plans • Preparation of plans for natural precincts and heritage zone • Preparation of special regulations for natural features • Dovetailing urban requirements into the landscape/district plan, to ensure minimal impacts of urban resource uses on surrounds and vice versa • Integration of the conservation plan in the Development Plan of the city B. Develop core zone plans for city heart/lungs, and buffer zone plans for city periphery, for greener and bluer land-use, drainage and fewer skyscrapers	Municipality, Architects, NGOs, Citizens' associations, Media, National Institute of Urban Affairs	5 yr

Actions	Steps	Suggested Responsibility (other than Ministry of Urban Affairs, and MoEF which are common to all)	Time Frame
	C. Wherever cities are emerging from older urban settlements, build on eco-friendly designs developed traditionally, and supplement them with new eco-friendly design concepts		
3. Nurturing and Restoration: Maintain and enhance current diversity,; regenerate or restore where already degraded	A. Popularize traditional practices aiding in conservation (bird food-water, worshipping plants) B. Plant species, medicinal, butterfly-host or beautiful local trees, shrubs, climbers in public and private lands, prioritising indigenous species C. Clean lakes, pools, streams, coastal/marine stretches D. Restore hill and wetland vegetation, where possible with local species E. Reintroduce indigenous fauna where feasible, focusing on species that would not create conflicts	Citizens, Students, Forest Department, Municipality, Societies, Corporate bodies, Institutions	5 yr
4. Protection: Prevent conversion, encroachment, degradation	A. Conserve major and minor biodiversity corridors within the city, and identify and conserve biodiversity hotspots such as forested belts, wetlands (lakes, tanks, rivers/streams), coastal/marine stretches, institution campuses with considerable biodiversity, gardens, and other such spaces, as green belt/natural heritage sites B. Control pollution at industrial and sewage discharge points C. Control trade of animals and medicinal plants by involving citizens and monitoring markets D. Promote eco-friendly zoos, snake parks, rescue/rehabilitation/breeding centers, botanical gardens E. Make transplantation of trees mandatory in all road widening, construction, or other urban development plans F. Provide incentives for, and promote, ecologically friendly infrastructure and civic facilities, including transportation, construction, communication, sewage/garbage management, water harvesting and use, etc.	Educational and other institutions, Municipality, Industry/Corporate bodies, Ward Councils, Forest Department, Media	2 years for declaration/ notification
5. Sustained Use: Promote sustainable traditional use and modern eco-friendly use	A. Encourage water-bodies, green belts, and other open spaces for ecologically sensitive educational and recreational use B. Facilitate and help organise bio-resource based livelihoods, including natural dyes, seasonal fruits and fruit-based products, leaf-based crafts and utensils, and so on	Forest Department, Municipality, Societies, Groups of resource users, Ragpickers	1 year to initiate

Actions	Steps	Suggested Responsibility (other than Ministry of Urban Affairs, and MoEF which are common to all)	Time Frame
	<p>C. Facilitate and help organise ragpickers to recycle wastes in a safe manner, and maximise earnings from this</p> <p>D. Promote home and terrace gardening of vegetables, fruits, spices and medicinal plants, using recycled household organic waste</p>		
<p>6. Adding Value and Creating Awareness: Promote awareness of multiple values of biodiversity, and citizen's sense of ownership</p>	<p>A. Create nature-education walks around hills, waterbodies, forest belts, and other natural sites</p> <p>B. Develop camps and resorts with eco-facilities</p> <p>C. Promote students competitions and projects</p> <p>D. Create awareness regarding biodiversity-friendly lifestyles, architecture, transportation, water harvesting, recycling and waste management</p> <p>E. Popularise concept of 'ecocity' or other equivalent term, as a long-term vision of the development of the city</p>	<p>NGOs, Entrepreneurs, Municipalities, Media, Educational institutions, Relevant departments</p>	<p>1 year to initiate</p>
<p>7. Legal Measures: Strengthen existing legal measures for conservation, and enact new ones for gaps</p>	<p>A. Review existing legal measures (urban development laws, tree/green areas laws, etc.), and strengthen where necessary, including by involving citizens centrally;</p> <p>B. Utilise to the maximum existing provisions such as those of the 74th Constitutional Amendment, the Environment Protection Act (in particular its notification on Ecologically Sensitive Areas), the Biological Diversity Act, etc.</p> <p>C. Enact new legislation on green/blue heritage, especially to conserve natural sites like forests and wetlands (e.g. see for instance Nagpur Heritage Regulations), and to ensure that surrounding biodiversity-rich areas (including agricultural areas) are not eaten up by urban sprawl</p> <p>D. Implement and use relevant orders of courts, e.g. Supreme Court orders of July 25, 2001, in Hinch Lal Tiwari vs. Kamala Devi and Others, Civil Appeal No. 4787 of 2001, regarding wetlands within settlements</p>	<p>Institutions like National Institute of Urban Affairs, NGOs working on urban and 74th Amendment issues, corporators and municipal authorities</p>	<p>2 years for review; 3-5 years for new legislation</p>
<p>8. Green Funding: Share benefits/ costs equitably amongst primary and secondary users</p>	<p>A. Charge small fee for eco-walk for maintenance and to benefit poor colonies nearby; provide employment and other earning opportunities to such colonies to create stake in protecting natural sites</p> <p>B. Tax industries for water and air pollution control</p>	<p>Forest Department, Municipalities, Industry, Citizens/Ward councils, NGOs, Planning & Finance Department</p>	<p>3 years to set the financial measures in motion</p>

Actions	Steps	Suggested Responsibility (other than Ministry of Urban Affairs, and MoEF which are common to all)	Time Frame
	C. Seek private/corporate funds for studies and demonstration/development projects D. Charge a low ecosystem service (e.g. water) fee to residents, for maintenance of waterbodies, hills and adjacent/upstream ecosystems that provide essential services to the urban area E. Eco-friendly urban development budgeting to reward carbon friendly cities/wards/ technologies from national carbon funds		
9. Public Accountability and Participation: Ensure public participation and access to information, undertake periodic reporting	A. Make all information relevant to the urban environment/development publicly accessible in convenient ways B. Involve citizens and citizens' groups (NGOs, Societies, Ward bodies) at every stage of decision-making and implementation C. Facilitate urban community management of natural heritage sites (Urban CCAs; see Strategy 7.1.2.2) D. Put into place an independent system of monitoring and evaluation	Municipal authorities, citizens' groups	2 years to put such a system in place

Source: Adapted from a note submitted by RANWA, action points in the Nagpur Sub-state Site BSAP, and the Urban Biodiversity Sub-thematic Review

7.1.2.6 Strategy: Tackle 'Non-Utilisation' Threats to Natural Ecosystems and Species

(Note: This refers to threats other than those caused by over-exploitation or over-use, for which see Strategies 7.1.4.2 and 7.1.4.3; and those caused by 'development' projects, for which see Strategies 7.1.7.2 to 7.1.7.4, and 7.1.10.1; and those caused by 'encroachments', for which see Strategy 7.1.5.2)

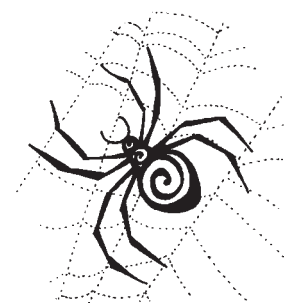
1. Take Preventive and a Meliorative Measures Relating to 'Natural' Disasters

Take measures to prevent, or minimise the damage caused by, 'natural' disasters like floods, cyclones, droughts, earthquakes, and epidemics, when these are 'unnaturally' destructive and not part of the natural cycles. Formulate appropriate disaster management action plans for the same.

Justification: Considerable biodiversity loss takes place due to 'natural' disasters, largely due to increased intensity, changing patterns, or other factors that are brought about by human activities. While floods, droughts, etc. have been part of nature, their impacts have greatly increased due to various disruptive activities like deforestation, construction on floodplains, artificial river course changes and inappropriate embankments, dam bursts, monocultures, etc.

Suggested Responsibility: Local community institutions and local authorities, with guidance and support from the Disaster Management Authority at the Ministry of Home Affairs, MoEF, MoA, other relevant ministries, disaster management research and training institutes and centers such as the one at Indian Institute of Public Administration, IITs, relevant CSIR institutions, HUDCO, NGOs working on this subject, independent experts, and state training institutes.

Time Frame: Disaster management plans for key ecologically sensitive areas within 3 years; implementation of urgent measures within 2 years thereafter (or simultaneously where already known); other measures ongoing



Steps:

- i. Build a strong institutional structure for all disaster management functions at the national and state levels;
- ii. Assess the main disaster-prone areas and the key disasters that could strike in such areas;
- iii. Build capacity of local communities and civic authorities towards disaster preparedness and response. This would include the setting up of Disaster Management Cells in LBSNAA, IGNSA etc. All IAS and IFS officers to undergo basic training in disaster management after recruitment. All district cadre staff, such as village extension workers and revenue functionaries, to undergo training in disaster management at the time of induction. All elected representatives and staff of local self governance institutions also to be provided the same kind of training. Institute refresher courses in high-risk zones.
- iv. Develop specific disaster prevention action plans for each 'high risk and vulnerability' zone.
- v. Develop preventive structural measures and incorporate in all public and private development initiatives. This would include the development of a 'safe housing' zone-wise atlas for the country.
- vi. Provide central and state funding for the implementation of preventive and ameliorative measures identified in such plans; focus especially on the full use of elements of biodiversity (tree belts, mangroves, natural enemies of pests, biodiverse plantations and agriculture, etc.) in such measures.
- vii. Set up regional and national early warning and alert systems, which can speed up the response rate of citizens to respond to disasters.

2. Minimise the Impacts of Alien Invasive Species

(**Note:** see Definitions, for explanation of the term 'alien invasive species'. For further details, see also *Invasive Alien Species and Biodiversity Sub-thematic Review*)

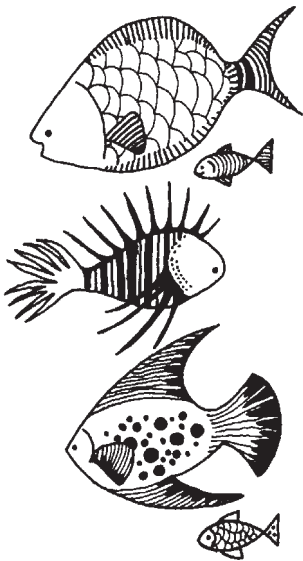
Take urgent steps at a national level to minimise the impacts of alien invasive species, including:

- a. Putting into place a stringent procedure (as per steps suggested below) for clearing any proposals for introduction of such species, and, till then putting on hold any existing proposals (e.g. ICAR's proposal to introduce the Rainbow trout into Uttaranchal, as announced in its advertisement of July 16, 2002);
- b. Consolidating the currently scattered attempts at tackling species which have already invaded, into a systematic nationally coordinated campaign, through the Plan suggested below;
- c. Creating awareness about the impacts of invasive species, to reduce inadvertent introductions.

These steps should be based on the following *principles*, which need to be integrated into appropriate policy and legal instruments:

- a. There should be no further introduction of alien species into the wild (terrestrial or aquatic ecosystems);
- b. Exceptions to this should go through stringent EIA procedures with a focus on biodiversity, and on no account should clearance be given if the introduction is likely to cause biodiversity loss; this should include EIAs of the parasitoids, predators, and micro-organisms for agricultural practices such as Integrated Pest Management, or for the rapidly growing use of vermiculture;
- c. Introduction of alien species including GMOs into agricultural systems should be preceded by a stringent and long-term EIA, with a focus on impacts on wild and agricultural biodiversity and on local livelihoods, and on no account should clearance be given if the introduction is likely to cause damage to these;
- d. The precautionary principle should be paramount in cases where the potential impacts are unclear;
- e. Liability for studies and damage should be assigned to the agency or person who is proposing to introduce an alien species;
- f. Alien species already prevalent should be utilised for short-term benefits for local communities (e.g. by making products for domestic or commercial use), till they are eliminated.

Justification: As described in Chapter 5.1, alien and other invasive species are a serious threat to biodiversity in India. Many measures have been tried out against these, but there remain serious gaps in understanding the impacts, in experimenting with innovative methods of containing and preventing the impacts, and in regulating the introduction of new species.



Steps:

i. *Prepare a National Invasive Species Management Plan (NISMP)*

A National Invasive Species Management Plan (NISMP) to be prepared, containing measures to implement the guidelines mentioned below, and focusing on both preventive and ameliorative measures. The NISMP should (a) inventorise invasive species, and (b) prioritise actions on each of these, starting with the following key invasive species:

- *Lantana*
- Water hyacinth *Eicchornia* spp.
- *Prosopis juliflora*
- *Parthenium*
- *Eupatorium*
- Marine ballast exotics
- The exotic honeybee *Apis mellifera*

It should also focus centrally on measures to restore the original vegetation to the extent possible.

The NISMP should develop guidelines on invasive species, based on those developed under the related work programme of the Convention on Biological Diversity (www.biodiv.org/programmes/cross-cutting/alien) and the Global Invasive Species Programme (<http://globalecology.stanford.edu/DGE/Gisp>).

Suggested Responsibility: MoEF in association with NBPGR and other relevant Centres/Bureaus of Ministry of Agriculture.

ii. *Establish a unified command for plant and animal quarantine*

A proposal to establish a Plant Quarantine Authority of India, under the Government of India, is under consideration in the Department of Agriculture. This has been mooted for the scientific requirements of pest-risk analysis, development of national standards, domestic and national quarantine, and other functions. Being a signatory to the International Plant Protection Convention (IPPC), India is obliged to have a National Plant Protection Organisation (Central Regulatory Agency) responsible for meeting international obligations relating to phytosanitary measures.

This proposal needs to be made more comprehensive, covering quarantine measures in respect of terrestrial and aquatic organisms (including fish). Accordingly, legislation for establishing an autonomous Quarantine Authority of India is needed, taking inputs from the set-up of other countries such as the other United States Department of Agriculture's Animal and Plant Health Inspection Service.

It is important to establish quarantine offices and procedures outside PAs (e.g. to ensure buffer zones free of introduced species including GMOs), and not just at airports/dockyards, to prohibit chance entry of alien species, as has been practised in many other countries.

Ongoing Relevant GOI Schemes/Programmes:

(i) Plant Protection Programme, and (ii) Ministry of Agriculture Programmes being undertaken by the Division of Plant Quarantine, NBPGR.

3. Tackle Pollution

Minimise and, where possible, eliminate pollution of various kinds that is adversely affecting biodiversity, especially from pesticides, heavy metals and non-pesticide organochlorines, including those used in plastics (for this see also Pesticides/Toxics and Biodiversity Sub-thematic Review. Prepared Under NBSAP).



Steps:

- i. Conduct field studies on the impacts of toxics on species and wildlife populations, based on a combination of local community observations and assessments by outside scientists. These should include:
 - Impacts of long-distance toxicity drifts of pesticide and PCB residues, including through trans-national collaborative research;
 - Impacts on priority species, including apex species such as raptors and mammalian predators, key indicator species such as amphibians and bees, and pollinator species;
 - Impact of toxics on biodiversity in toxic 'hotspots' such as tea gardens, mining areas, fly-ash dumps, high agricultural run-off areas (e.g. wetlands and forests surrounded by chemical-intensive farming, e.g. Kaziranga National Park, Assam), other cash crop-cultivating areas with intensive use of pesticides (e.g. cashewnut in Kerala, sugarcane in Maharashtra, cotton in Andhra, Gujarat, and elsewhere), specific highly polluted spots (e.g. Gulf of Mannar, Tuticorin, the Vapi-Ankaleshwar chemical belt in Gujarat, and Mahim Creek in Maharashtra);
 - Sites where an alarming drop in wildlife numbers, or abnormalities, are reported (e.g. Damanganga, near Vapi, Gujarat, where a dramatic drop in fish biodiversity and abnormalities in mudskippers are reported; or Kannur, where there are reports of weird nesting patterns);
 - Determining the source of toxic residues, which often travel long or complex routes;
- ii. Take up collaborative work between laboratory researchers and field researchers, to use the results of the toxicity tests of the former in the field;
- iii. Regularly monitor the effects of toxics on wildlife populations, including bio-monitoring by village communities and governmental ground staff, whose capacity will need to be built for the purpose;
- iv. Build national and regional/local information and alert networks, amongst community institutions, NGOs, government field staff, research organisations, etc., to enable quick transmission of news on disasters, regular exchange of information and experience, and joint responses;
- v. Set up national and regional/local clearinghouses of information on toxics, preferably housed in independent institutions/organisations (but with governmental support), for the specific task of generating and disseminating information on toxics;
- vi. Set up a reporting and feedback mechanism to the clearing-houses, using a simple proforma that could be used by forest officers, district officials, research bodies, NGOs, community members, tourists, and others;
- vii. Hold dialogues and mutual learning exercises between toxics experts and biodiversity experts.
- viii. Create widespread public awareness about the impacts of toxics, related regulations, and alternatives available (see Section 7.1.6).
- ix. Introduce informative labelling of all toxic or toxics-containing products, such that consumers are made aware of the possible impacts;
- x. Facilitate full discussion and action on these issues at the level of *gram sabhas*, especially emphasising the human and livestock health impacts of toxics;
- xi. Take policy, legal and macro-economic measures relating to organochlorines, pesticides and heavy metals, which include:
 - a. Phasing out of the 12 most deadly persistent organic pollutants or POPs (as committed under the POPs Treaty);
 - b. Replacing these and other toxic products with safer materials;
 - c. Moving towards zero waste creation or waste minimization;
 - d. Phasing out all incineration, unless very specific, centralized facilities for certain categories of bio-medical waste meeting the prescribed standards are set up;
 - e. Phasing out and banning chlorinated plastics like Poly Vinyl Chloride (PVC) and polyurethane;
 - f. Ensuring full public access to related information, and transparency in related decision-making; this would include regularly updated Toxics Release Inventories from every relevant industry or unit;
 - g. Reviewing exports of toxic chemicals and products that use toxic materials, eventually phasing them out;
 - h. Introducing Extended Producer Responsibility, such that the manufacturer has to take back toxic products for proper disposal, and strict liabilities for violations;
 - i. Identifying ecologically sensitive areas where no industry or process using toxics is permitted, and, in other areas, conducting comprehensive impact assessment prior to setting up any industry or process





- which uses toxic materials (plugging any weaknesses that may be present in the current EIA notification in this regard);
- j. Providing incentives to farmers, industrialists, and individuals/families to adapt toxics-free alternatives, including organic farming and organic food consumption, cleaner processes in chlorine based industries, herbal pest control methods, cloth bags as alternatives to plastic bags, lead and cadmium-free paints, batteries, and dyes, etc.;
 - k. Factoring the true ecological and health costs of toxics into their price, to enable safer alternatives to compete in the market;
- xi. Create the conditions for a strong citizens' movement against toxics and for safer alternatives.
 - xii. In a similar vein, take urgent steps relating to the following kinds of pollution, which have adverse impacts on biodiversity (see schemes, programmes, and action plans that already exist on these sources of pollution):
 - Water and air pollution impacting on biodiversity
 - Oil spills and other marine pollution
 - Land pollution especially that affecting soil biodiversity
 - Noise, especially in wildlife conservation areas

Suggested Responsibility: Central Pollution Control Boards, MoEF in association with Department of Ocean Development, Ministry of Science and Technology (including Department of Biotechnology), and with the help of NGOs, citizens' groups and local communities; advocacy and lobbying by people's movements and citizens' networks.

4. Predict, and Take Proactive Steps to Counter, the Impacts of Climate Change

Take proactive adaptation actions to enhance the resilience of natural and agricultural ecosystems, and related livelihood strategies of ecosystem-dependent people. This would entail conducting studies to identify such actions (see also Section 7.1.1.1, Action 8), developing strategies to incorporate climate change concerns in ecosystem planning exercises like Forest Working Plans, working with communities to identify, encourage, and supplement their own adaptation mechanisms, etc. Amongst the urgent steps needed is the planning and implementation of corridors that would help ecosystem elements such as wildlife to migrate in the event of climatic changes. Continuous community-based monitoring at selected sites, representing different biogeographic regions and ecosystems, also needs to be urgently initiated. This has to be done both in terrestrial and aquatic systems; special focus would be needed on marine ecosystems, since sea-level rise could cause much more direct and rapid impacts on biodiversity than the more gradual changes in terrestrial vegetation.

For details of these kinds of actions, for a specific region, see Box 7.1.2.8.

Box 7.1.2.8 Actions to Counter Climate Change in the Western Himalaya Ecoregion (WHE)

1. **Rehabilitation Action:** Assist the species migrating in search of suitable sites. Assistance does not mean transferring a forest from one place to another physically. The forest destruction due to climatic change is expected to occur over several decades. What humans can do is assist the migrating species in their process of establishment in favourable areas. For example, seedling establishment can be promoted by transferring seeds to favourable micro-sites, or seedlings planted could be helped to become trees. Management can help by restricting the loss due to grazing or burning of species during its migration and settlement in new sites. (*Responsibility:* State Forest Departments, Universities, NGOs, Research Institutes, and village communities).
2. **Monitoring:** Continuous monitoring of species movement, changes in vegetation (such as colonisation of meadows by woody species), receding of glaciers, and changes in water flow should be undertaken. Eventually the monitoring has to be community-based, since they are the ones dealing with vegetation in their day-to-day life, and are regularly observing (and feeling the impact of) the changes. Some orientation of communities on regular or systematic monitoring would probably yield a lot of valuable information. However, scientific studies would be required to make an effective prediction of possible impact. The idea is to monitor migrating species and give them support to protect them from

additional stress due to anthropogenic pressure. (*Responsibility:* Scientists, State Forest Departments, Research Institutes and members of the community).

3. **Research:** The Western Himalaya Ecoregion should be made a part of the global research network on climate change. Changes due to global warming and CO₂-enrichment need to be investigated. Timberline ecosystems and adjacent crop-fields are particularly suitable material for this.

Source: Western Himalaya Ecoregional BSAP

7.1.2.7 Strategy: Regenerate and Restore Degraded Ecosystems

(This should be read in conjunction with Sections 7.1.5.1 and 7.1.5.2)

Actions

1. Regenerate and Restore Degraded Common Lands; Review 'Wasteland' Development Programmes From the Point of View of Biodiversity

Regenerate and restore degraded common lands, including pastures, forests, wetlands, etc., ensuring that:

- i. As much of the original indigenous ecosystem and species as possible are restored, exotics and monocultural plantations are avoided completely; the objectives should include restoring corridors for wildlife;
- ii. The exercise is carried out by adjacent communities, with joint decision-making powers along with relevant government department over species to plant or reintroduce and other measures to take, and a full share of the benefits that accrue;
- iii. There is in-built, participatory monitoring, to ensure that the goals are being met and mid-term corrective actions, if needed, are taken.

This action should build on the considerable ongoing work at regenerating and restoring degraded lands, including under JFM and wastelands development programmes, but ensuring that biodiversity and biodiversity-related livelihoods are kept as a central focus. This needs integration of biodiversity considerations into the guidelines and programmes relating to the wastelands and watershed programmes of MoEF, MoRD, etc.

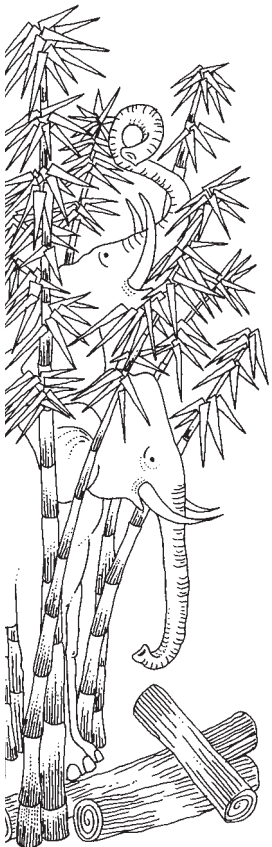
Justification: India's vast degraded landscapes are in urgent need of regeneration and restoration. Considerable work on this has taken place in the last couple of decades, with some degree of success. However, this effort has not necessarily been oriented either towards restoring (to the extent possible) the indigenous biodiversity elements of the area, or towards providing long-term benefits to the most underprivileged sections of local communities; in fact, there has at times actually been an adverse impact on so-called 'marginal' lands that are critical for wildlife and poor people's livelihood security. There has often been a presumption that the best reclamation is that of planting trees, notwithstanding the fact that the original area may have been a critical grassland or pasture, or other kind of ecosystem (see also Chapter 3.2.3). A fundamental re-orientation is therefore required in the definition of 'degraded' lands, and in the guidelines, programmes and schemes for regenerating and restoring degraded lands, in order to focus on biodiversity and on biodiversity-based livelihoods of the most underprivileged sections of communities.

Suggested Responsibility: NAEB (under MoEF) and NWDB (under MoRD), and the national JFM and Watershed Development network, with state forest and animal husbandry departments, state-level JFM networks, biodiversity and livelihood experts from relevant NGOs like SPWD, local communities, and mass tribal/people's organisations. The Department of Indian Systems of Medicine and Homeopathy could also be involved.

Time Frame: Review and revision of guidelines in one year; implementation ongoing thereafter.

Steps:

- i. MoEF and MoRD to set up a joint working group to review and revise the existing guidelines and plans for wasteland reclamation and restoration of degraded lands, including for JFM programmes where relevant;



- this group should consist of the agencies and parties mentioned under '*Suggested responsibility*' above;
- ii. Re-orient ongoing and proposed degraded land and wasteland regeneration programmes according to these new guidelines, ensuring that the central focus is on biodiversity revival and enhancing the livelihood security of communities (in particular underprivileged sections including women);
 - iii. Select from a pool of techniques to be tried out for appropriateness in a given situation, including natural regeneration, enrichment planting, seed bank manipulation, afforestation using indigenous species, and acceleration of regeneration using biological treatments (e.g. mycorrhizal inoculation);
 - iv. MoEF to revise Working Plan code to ensure that natural grasslands and shrub lands are not treated as 'blanks' for afforestation;
 - v. Initiate an in-built, participatory process of monitoring such programmes, with a transparent system of reporting the results, and a system of mid-term revisions in case corrective measures are indicated.

Ongoing Relevant GOI Schemes/Programmes:

- Programmes being undertaken by National Afforestation and Eco-development Board under Regeneration and Development Wing, MoEF.
- Establishment of *Vanaspati Vanas* Scheme, under Department of Indian Systems of Medicine and Homeopathy.
- (i) Integrated Wastelands Development Programme, (ii) Other Schemes of Wasteland Development Programme, (iii) International Co-operation Programme, of Ministry of Rural Development.

2. Restore Mined Lands

(For details see section 7.1.7.4 Action 4).

3. Regenerate and Restore Degraded Inland Water Bodies, Coastal Areas and Marine Ecosystems

Regenerate and restore degraded inland water bodies, coastal lands, and degraded marine ecosystems such as coral reefs, mangroves, beaches and sea grass beds, ensuring that:

- i. As much of the original indigenous ecosystem and species as possible are restored, avoiding exotics;
- ii. The exercise is carried out as a community-based action, involving outside scientists in advising regarding the species composition and ecosystem quality;
- iii. There is in-built, participatory monitoring, to ensure that the goals are being met and mid-term corrective actions, if needed, are taken.

Justification: A substantial portion of India's waterscapes such as lakes and ponds, stretches of some rivers, mangroves, coral reefs, sea grass beds and beaches are degraded to a severe extent. While lakes and ponds are being incessantly reclaimed for construction purposes or converted into recipients of pollutants, mangroves and coral reefs suffer uncontrolled resource exploitation and pollution. Degradation of the beaches occurs where there is excessive tourism impact. A certain amount of progress has been made in re-forestation of coastal wetlands with mangroves (though this does not necessarily amount to total habitat restoration), but little progress or even attempts have been made with aquatic ecosystems.

Suggested Responsibility: MoEF, state Forest/Environment departments, tourism departments, in conjunction with local communities and scientific institutions.

Time Frame: Review and production of guidelines, 2 years; implementation at sample sites, 5 years; ongoing thereafter at other sites.

Steps:

- i. Review existing activities along these lines, and list lessons learnt;
- ii. Prepare a set of guidelines for the regulation and restoration of degraded aquatic sites;
- iii. Implement regeneration and restoration measures at a sample of selected sites that need critical attention;
- iv. Apply lessons from these initial sites to remaining areas.



Ongoing Relevant GOI Schemes/Programmes:

Wetland Conservation, Coral Reefs sub-programmes under Conservation of Natural Resources Programme of MoEF.

7.1.2.8 Strategy: Prevent and Mitigate Human-Wildlife Conflicts

(Note: The points below were reviewed by (and additional points included) , at a *Brainstorming Session on Human-Wildlife Conflicts*, 30 Sept. -1 Oct. 2002, Bangalore, organised by the Centre for Ecological Sciences, Asian Elephant Research Centre, SACON, Wildlife Trust of India and Kalpavriksh, in association with NBSAP. See also *Human-Wildlife Conflicts Sub-thematic Review and section 7.1.9.2 Action 6*).

Take innovative and urgent steps to prevent and mitigate human-wildlife conflicts across the landscape and seascape, and especially in critical biodiversity areas.

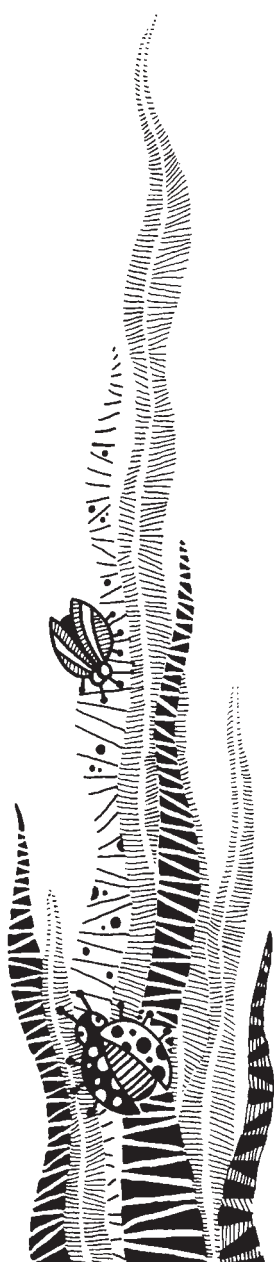
Justification: Though there is no comprehensive database or monitoring, reports from across the country suggest that human-wildlife conflicts are an increasing problem. The scale and nature of the conflicts have intensified, they have spread to virtually all regions of India, and people's view of the situation has also become more antagonistic (or at least less tolerant). So far, attempts at dealing with this problem have been ad hoc and short-term, largely restricted to some preventive measures like fences and compensatory measures like monetary payment. A much more proactive approach to dealing with the widespread problem of human-wildlife conflicts is needed. The types of conflicts and the species causing them and the context in which the problems occur all vary across the country. This diversity of issues needs to be recognised and the solutions tailored to local situations. The traditional approach of local communities to solving these problems needs to be documented, and lessons learnt should be integrated into the comprehensive solutions planned to deal with the conflicts. It is also vital to monitor the efficacy of the management actions to determine if they are indeed reducing conflict and also assisting in the survival of the animals.

Suggested Responsibility: State Forest and Agricultural Departments through the local PA management, with *panchayat* and other local bodies like VFCs, EDCs, VSSs, with help and guidance from conservation NGOs and experts, MoEF, MoA, MoRD, MoTA, WII, IISc and other national institutions.

Time Frame: 5 years in a representative sample of sites and for a representative set of species, to demonstrate innovative methods; ongoing thereafter at other sites.

Steps:

- i. The Government of India should consider initiating an *All-India Coordinated Project on Human-Wildlife Conflicts* under the MoEF, but coordinated by an independent national institution such as the Centre for Ecological Sciences (IISc) or the Wildlife Institute of India. For this and for action at the level of individual states, the following should be kept in mind.
- ii. The species involved in the conflicts may vary from one site to the other, and a region-specific, species-specific, and culture-specific approach would be necessary, based on an understanding of the ground situation.
- iii. It is vital that local communities (usually the affected party), local conservation NGOs and relevant government departments jointly evolve appropriate solutions to the conflict, and participate in planning and implementing these solutions. This would require baseline studies to map badly affected areas, and identify traditional and new measures already being used for crop/livestock protection, their current efficacy, and the gaps therein.
- iv. These solutions should give equal weightage to the conservation interests of the animal population and the survival interests of the local human population; in the context of threatened species, conservation interests must be given priority.
- v. The measures taken should aim as much at the root causes as the symptoms, moving towards restoring habitats and prey-predator balance, restoring corridors and buffers (such as the ongoing restoration of the Eastern



- Ghats-Western Ghats elephant corridor in Karnataka), providing water, reviving or creating community stakes in conservation, reviving a spirit of love and tolerance towards wildlife, and other appropriate steps.
- vi. Restoration of corridors for elephants (the species involved in the most serious conflicts in parts of India) should be amongst the highest priorities, including by relocating or re-routing developmental infrastructure, commercial plantations, etc.
 - vii. Preventive and ameliorative measures should include green fencing which reduces damage and provides additional livelihood sources; solar electric fencing on private lands with farmer involvement (as successfully tried out in some parts of Karnataka); predator-proof livestock holds (e.g. snow-leopard proof corrals in Ladakh, developed by Snow Leopard Conservancy, *see Box 6.22*); cropping pattern changes (including towards agroforestry options); management of individual animals (e.g. catching single male elephants rather than entire herds); and an exploration of the range of traditional methods used by communities including, where it can be done in strictly controlled situations, trapping and hunting of specified species using traditional techniques (*see Human-Wildlife Conflicts Sub-thematic Review*). Experimentation with different methods in diverse situations should be carried out, and the lessons learnt should be well-documented.
 - viii. Inter-state and international cooperation would be crucial in resolving several conflict situations; the ecoregional or ecosystem approach (*see Section 7.0*) would enable integration of such cooperation.
 - ix. Where compensation becomes inevitable (as would be the case at least in the near future till the above measures take effect), the procedures for paying this should be greatly simplified, decentralised and de-bureaucratised, moving towards greater community control over the decision-making, and enhancing the payment amounts to a level where the true costs being borne by local people compensated. A first step would be to decentralise the sanctioning of *ex gratia* or compensation (e.g. Karnataka has devolved it to the DCF and CF levels). A flexible system of confirming the damage should be instituted, e.g. by accepting cases for compensation forwarded by an authorised *Van Suraksha Samiti*/Joint Forest Management Committee/Ecodevelopment Committee under the supervision of the *gram sabha* or general assembly. Alternatively, such committees or other village bodies could be given lump sum grants to be used for this purpose (*see also Section 7.1.9.2 Action 6*).
 - x. The Rural Development, Agriculture, Animal Husbandry, Tribal Development/Welfare, and other relevant line agencies must be mandated to assist in the above steps, including through allocation of adequate budgets, technical assistance in preventive and ameliorative measures such as cropping pattern changes, compensation, etc. Insurance companies should be encouraged to offer crop insurance after working out a satisfactory system of evaluating the damage and effectively providing the compensation.
 - xi. The measures implemented should be monitored in a participatory manner for their efficacy.
 - xii. Where problem-causing animals are caught and released they should be marked (ear tags, colour coded collars and other such devices) to ensure that they can be easily recognised if they are involved in conflict again. If other solutions fail and there is no need of the problem-causing individual wild animal for captive breeding, then the decision to eliminate the animal should be taken and implemented.
 - xiii. The above actions should be located within the context of adopting a landscape/waterscape approach, as described in *Section 7.0.1*.

7.1.2.9 Strategy: Strengthen Trans-Boundary Cooperation for Conservation

Actions

1. Identify Critical Trans-Boundary Sites for Priority Action, and Negotiate Conservation Action Including 'Peace Parks' with Neighbouring Countries

Identify trans-boundary sites that are critical for conservation, because they are still rich in biodiversity, or provide critical ecosystem benefits, or have a high degree of poaching/illegal trade (for examples, *see Boxes 7.1.2.9 and 7.1.2.10*). Negotiate agreements with the relevant neighbouring countries, for appropriate conservation measures for these sites. Build on discussions already initiated by MoEF with Nepal, Bhutan, and other countries. Initiate dialogue on the possibility of 'Peace Parks', especially with Pakistan, Myanmar, and China, such as have been established between other previously in-conflict countries of the world.



Justification: While individual countries of the region have taken conservation measures in the border areas, the lack of systematic trans-boundary cooperation hampers the efficacy of these measures. Poaching, timber theft, illegal trade, fire, limited management reach and abilities, etc., are some of the contributing factors. Some initiatives at coordinating conservation activities do exist (e.g. between India and Nepal), but these are hampered by inadequate staff and resources, and the lack of involvement of local communities, NGOs, and authorities. Much greater attention is therefore warranted at some critical sites.

These issues are even more critical with marine biodiversity where water currents transport organisms across geopolitical boundaries, migratory fishing stocks often straddle several countries, and pollutants disperse across national boundaries, affecting biodiversity at sites faraway from their origin.

Suggested Responsibility: MoEF and Ministry of Defence, with the respective state Forest Departments, Ministry of External Affairs, local authorities, NGOs, and communities on both sides of the border.

Time Frame: 5 to 10 years.

Steps:

- i. Identify, through consultation with neighbouring countries and local communities/authorities, sites for trans-boundary conservation measures (for an indicative list, see Boxes 7.1.2.9 and 7.1.2.10), and the proposed boundaries and key management objectives of each site;
- ii. Prepare joint management plans through a similar consultative process, using a landscape or seascape approach in which multiple land/water uses are integrated into a conservation and development model, with conservation stress on areas/species of high biodiversity value;
- iii. Restore and increase the connectivity between such areas, including protected areas and community conserved areas (CCAs);
- iv. Focus conservation efforts on threatened and neglected ecosystems and species/taxa, ecosystems with high ecological services value, areas which are critical for cultural and livelihood reasons, species/taxa that are keystones or indicators, etc.;
- v. Tackle, through joint teams comprising officials and local community members, the key trans-boundary threats, such as poaching, timber theft, fire and illegal trade;
- vi. Encourage conservation-oriented practices of local people, and empower them to manage resources in the border areas; in particular, empower nomadic or resident communities that straddle both sides of the border in order to utilise their knowledge and practices for conservation;
- vii. Initiate a dialogue with appropriate authorities in neighbouring countries, especially Pakistan, China, and Myanmar, about the potential for establishing 'Peace Parks' in ecologically critical areas such as the western desert, the Siachen area, the eastern Himalaya and forest belt, etc.;
- viii. Undertake collaborative, periodic monitoring of trans-boundary areas.

Box 7.1.2.9 Priority Trans-Boundary Sites for Conservation Action in the Eastern Himalaya

Candidate priority trans-boundary areas in the Eastern Himalaya for conservation action are:

- a. **Khangchendzonga Complex (India-Nepal)**, 11,500 sq km, containing Khangchendzonga Conservation Area in Nepal, Khangchendzonga Biosphere Reserve in Sikkim, Singalila National Park in Darjeeling Gorkha Hill Council and many other smaller protected areas in Sikkim (Fambonglo, Kyongsla, Maenam, Singba and Barsey) and Darjeeling (Senchal and Mahananda).
- b. **Jaldapara-Buxa-Phibsoo (India-Bhutan)**, 4,560 sq km, containing Buxa Tiger Reserve and Jaldapara Wildlife Sanctuary in India and Phibsoo Wildlife Sanctuary in Bhutan.
- c. **Jigme Dorji-Manas-Bumdaling (India-Bhutan)**, 13,700 sq km, includes Manas Tiger Reserve in Assam, India, and Manas reserve, Jigme Dorji National Park, Bumdaling Wildlife Sanctuary, Black Mountain National Park and Thrumsing La National Park in Bhutan.

- d. **Tawang-Khulong Chu (India-Bhutan)**, 8,790 sq km, amalgamating the Sakteng-Sessa corridor linking Sakteng and Khulong Chu wildlife sanctuaries in Bhutan with Eagle's Nest and Sessa Orchid reserves in Arunachal Pradesh of India.
- e. **Namcha-Barwa-Dibang Walong (India-China)**, 27,490 sq km, includes seven protected areas such as Dibang Valley, Mo Tuo, Dong Jiu, Namcha Barwa, Mahao, D'Ering Memorial and Mouling. The boundaries are based on the watershed boundaries of the Tsang Po/Brahmaputra River.
- f. **Namdapha-Hkakaborazi (India-Myanmar-China)**, 69,460 sq km, with a large number of conservation significance pockets such as Hukaung-Patkoi, Namdapha extension and Hukung, Kamlang-Hkakaborazi link, Hkakaborazi-Khaunglanohu, Joypur/Upper Dihang Reserved Forest, Hkakaborazi National Park, Kamlang Wildlife Sanctuary and Namdapha National Park.

Source: Natural Terrestrial Ecosystems Thematic BSAP

Box 7.1.2.10 Priority Trans-boundary Sites for Marine Conservation

The following is an indicative list of trans-boundary marine sites that need to be given priority in conservation:

- i. Gulf of Mannar and Palk Bay, straddling south-eastern India and northern Sri Lanka
- ii. Sundarbans mangrove and estuarine ecosystem, straddling eastern India and southern Bangladesh
- iii. Arabian Sea stretch straddling western India and south-eastern Pakistan
- iv. Indian Ocean stretch straddling Andaman and Nicobar Islands in India and countries of south-east Asia.

2. Strengthen International Measures to Combat Trans-Boundary Poaching and Wildlife Trade in Other Areas

In all areas including those not under trans-boundary protected areas, strengthen measures to counter poaching and wildlife trade.

Justification: India's boundaries with neighbouring countries are prime sites for illegal trade in wildlife products, poaching and timber theft. This happens even where the countries concerned have protected areas on the border, but is more common where there are no active conservation measures.

Suggested Responsibility: MoEF and Ministry of External Affairs with relevant state governments, and local communities (especially those straddling both sides of the border), with local NGOs.

Time Frame: Ongoing.

Steps:

- i. MoEF and other relevant organisations to review current initiatives at controlling poaching and trade, and the gaps therein;
- ii. MoEF and MEA, with relevant state governments, to hold consultations with neighbouring countries on possible measures to combat trade and poaching, key hurdles in taking such measures, and ways to overcome these hurdles; such consultations to involve local border-area communities, relevant NGOs, and the armed forces;
- iii. Communities (including nomadic ones) straddling the border between India and its neighbours to hold dialogues within the settlements of their own communities, and with other communities, regarding their possible role in conservation; this process to be facilitated by state or central government agencies;
- iv. Joint patrolling and anti-poaching teams consisting of community representatives, armed forces personnel and relevant state government officials to be set up at sensitive sites on the border, where trade and poaching is most rampant;
- v. Generous awards to be announced and given to communities, armed forces personnel, and others who report and prevent illegal activities relating to biodiversity along the border.



3. Tackle Other Trans-Boundary Threats Such as Pollution, Dams, Erosion, and Illegal Immigration

Identify trans-boundary threats caused by 'development' projects and political and economic forces, either originating from India and causing problems to other countries, or vice versa; take suitable action to minimize, and where possible eliminate, these threats.

Justification: Countries of the region have in the past been unmindful of the ecological impacts of their activities on land area, inland waterways and coastal waters of neighbouring countries. Examples include the environmental damage caused in Bangladesh, including to biodiversity-rich estuarine areas, by the Farakka Barrage in India; the damage caused in India and Bangladesh by excessive siltation from Nepal's deforested hill slopes; and the impacts of refugees and illegal immigrants from Bangladesh and Nepal into India (see *North-East Ecoregional BSAP*, *Sikkim BSAP*, and other BSAPs of the north-eastern states). Such practices still continue, and have been the source of considerable trans-boundary tension. Some of the problems are highly complex, and seemingly intractable, e.g. illegal immigration. Much greater international cooperation and more faith in community-level initiatives is needed to arrive at resolutions to such complex problems.

Suggested Responsibility: MoEF and Ministry of External Affairs, with state/local authorities, border communities, and local NGOs.

Time Frame: Initiate or revive discussions within one year; other measures ongoing there-after.

Steps:

- i. Identify threats related to 'development' projects and, political and economic forces, emanating from other countries to India's biodiversity, and vice versa;
- ii. Enter into dialogues with the relevant countries, involving local authorities and communities, to identify feasible ways of tackling these threats;
- iii. Offer to remove or minimise the threats emanating from India, as a gesture of goodwill, and provide incentives/or apply moral and diplomatic pressure to neighbouring countries to do the same.

7.1.3 Wild Biodiversity: Strategies and Actions for *Ex Situ* Conservation

Overall Strategies:

1. **Strengthen *ex situ* collections of animals and plants**, including zoological parks, aquariums, botanical gardens, home gardens and other sites for the *ex situ* breeding of animals and plants;
2. **Strengthen the network of culture collections of micro-organisms;**
3. **Give special focus to threatened and endemic species** in the above, in particular those that are candidates for **reintroduction** into the wild.

7.1.3.1 Strategy: Strengthen and Enhance the Role of Zoological Parks, Aquariums, and Other Wild Animal Breeding Facilities

(Note: This section should be read in conjunction with the related parts of the National Wildlife Action Plan and the National Forestry Action Plan. Some of the actions below are elaborated in these documents; however, the actions below also go beyond what is contained therein.)

Actions

1. Enhance and Expand Captive Conservation Breeding of Threatened and Endemic Species

Enhance current initiatives at captive breeding of threatened and endemic species, and introduce new ones in the case of species not yet covered, with a view to reintroduction into the wild (see also Strategy 7.1.2.4, Action 4). Species selection should be prioritised according to factors such as the degree and immediacy of threat, the chances of tackling the threat *in situ*, the possibilities of reintroduction, and the technical and financial feasibility of breeding. Lessons from several past and ongoing attempts (see Section 6.1.3), both successes and failures,



should be built into future attempts. Instead of setting up new zoos, the effort should be to considerably improve the quality of existing ones, and transform them from an orientation towards mere display of animals to one of captive breeding and public education.

Justification: Several animal species are seriously threatened in the wild, and in many cases there is a likelihood that threats will either continue or increase. Captive breeding of these species may enhance the chances of their recovery, especially in situations where reintroduction may be possible. However, such initiatives are expensive and prone to failure; they must therefore be prioritised and carried out with care.

Suggested Responsibility: National Zoo Authority, in association with Wildlife Institute of India, experts from other institutions, aquariums, reptile breeding centres, private breeders, etc., with inputs from MoEF, Department of Indian Systems of Medicines and Homeopathy, Department of Biotechnology and other departments of Ministry of Science and Technology.

Time Frame: Initiating new programmes for critically endangered species to be taken up urgently; others ongoing.

Steps:

- i. Update the information and put together a consolidated database on ongoing breeding initiatives related to threatened and endemic species;
- ii. Identify a prioritised list of other species which require captive breeding; ensure that this list includes small animals, which are in some cases even more threatened than large ones. Some species for immediate consideration would include: Malabar civet (if there are any found alive), Lion-tailed macaque, Great pied hornbill, vultures of various species, Forest spotted owlet, and Dugong or sea cow (this is not a comprehensive list, only an indicative one). Prepare a master plan for the collection and captive breeding of these selected species;
- iii. Provide the facilities to relevant zoos, aquariums, and other breeding centres, to undertake breeding of these identified species;
- iv. Set up marine aquariums and research centres at appropriate places along the coastline of India, using maximum of 'open water' undersea facilities and minimum of closed captivity conditions;
- v. Strengthen the role of zoos, aquariums, and other *ex situ* collections, for ecological, epidemiological and behavioral research, and provide adequate research and veterinary expertise to them;
- vi. Set up an information exchange and networking system amongst all the zoos, aquariums, and other *ex situ* animal facilities, including both governmental and private/NGO/institutional ones;
- vii. Review the status of potential sites for reintroduction (*see Strategy 7.1.2.4, Action 4*).

2. Breed Aquatic and Other Wild Animals that are Legitimately and Without Cruelty Used in Medicine or Trade

Breed faunal species whose trade is permitted, whose use does not involve cruelty, and whose existence in the wild may be threatened due to over-harvesting.

Justification : One way of reducing the threat to a species in the wild is to breed and use it from captivity, though this has to be done with considerable caution. 'There is an urgent need to develop packages of practices for cultivating or farming... marine organisms, sponges, soft corals, horse shoe crabs, etc. This would prevent rapid depletion of natural species and subsequent extinction from wild habitats' (MoEF 1999b).

Suggested Responsibility: MoEF and Department of Ocean Development, through local communities.

Time Frame: Initiate breeding in the case of the most threatened or vulnerable species within two years.

Steps:

- i. Identify species whose survival is at stake due to legitimate exploitation and trade, and work out *ex situ* breeding protocols for these; typically these will be small aquatic or terrestrial species, such as horseshoe crabs, fish, etc.;



- ii. Establish *ex situ* breeding sites that simulate, as far as possible, natural conditions;
- iii. Work out a marker or identification system to ensure that products coming from the captive-bred populations are distinguishable from those coming from populations in the wild;
- iv. Empower and build capacity of local communities to manage the breeding and as far as possible the produce, so they can obtain maximum returns from it, while maintaining the sustainability of the population.

Ongoing Relevant GOI Schemes/Programmes:

(i) MoEF's Conservation of Natural Resources programme; and (ii) Island Development sub-programme under the Coastal Community Programme of the Department of Ocean Development.

7.1.3.2 Strategy: Strengthen and Enhance The Role of Botanical, Herbal and Home Gardens, and Other *Ex Situ* Plant Collections

Actions

1. Enhance and Expand the Cultivation of Threatened and Endemic Plant Species

Enhance ongoing efforts for cultivating and propagating threatened and endemic plant species, and initiate efforts for cultivating species not yet covered, both with a view to re-introducing them into the wild.

Species selection should be prioritised according to factors such as the degree and immediacy of threat, the chances of tackling the threat *in situ*, the possibilities of re-introduction, and the technical and the financial feasibility of breeding.

Some species for immediate consideration are given in *Box 7.1.3.1* below.

Justification: Several plant species are seriously threatened in the wild, and in many cases there is a likelihood that threats will either continue or increase. *Ex situ* cultivation of these species may enhance the chances of their recovery, especially in situations where reintroduction may be possible. However, such initiatives need to be prioritised and carried out with care.

Suggested Responsibility: National Botanical Research Institute, state Forest Departments, University Botany Departments, Forest Research Institute, state Forest Research Institutes, regional institutes like TBGRI, private botanical garden owners, relevant NGOs and community institutions, with help from MoEF, Department of Indian Systems of Medicines and Homeopathy, Department of Biotechnology and other departments of Ministry of Science and Technology, National Medicinal Plants Board, ICFRE and BSI.

Time Frame: Initiating new programmes for critically endangered species within one year; others ongoing.

Steps:

- i. Update the information and put together a consolidated database on ongoing initiatives for cultivation of threatened and endemic species (see also actions on database and digitisation in *Strategy 7.1.1.2*); this includes *Swertia chirayita* (J&K and Kumaun Himalaya), *Taxus baccata* (Kumaun Himalaya), and *Picrorhiza kurroa* (Kumaun Himalaya) by GBPIHED, *Trichopus zeylanica* by Tropical Botanical Garden and Research Institute under an FRLHT programme, and others by similar institutions.
- ii. Identify a prioritised list of other species which require *ex situ* cultivation (starting with those listed in *Box 7.1.3.1*); ensure that this list includes 'lesser' plants, which are in some cases even more threatened than the 'higher' ones;
- iii. Prepare a master plan for the collection and cultivation of these selected species;
- iv. Provide the facilities to relevant botanical gardens and other *ex situ* collections to undertake cultivation of these identified species;

**Box 7.1.3.1 Threatened and Endemic Plants of India needing
Ex Situ Conservation Initiatives**

Western Ghats

Ampelocissus indica
Cayratia pedata var *glabrata*
Cinnamomum malabarica
Cinnamomum wightii
Clerodendron serratum
Curcuma pseudomontana
Decalepsis hamiltonii
Embelia acutipetalum
Garcinia indica
Garcinia travanocoria
Heliotropium keralense
Holostema annulare
Kingiodendron pinnatum
Madhuca longifolia
Mapia foetida
Pueraria tuberosa
Rauvolfia serpentina
Salacia oblonga

Western Himalaya/North-Western Himalaya

Aconitum heterophyllum
Angelica glauca
Arnebia benthemii
Fritillaria roylei
Heracleum candecans
Inula racemosa
Lavatera cashmeriana
Microstylis wallichii
Paeonia emodi
Saussurea obvallata
Taxus wallichiana

Andaman and Nicobar Islands

Microstylis wallichii

Eastern Himalaya

Aconitum ferox
Coptis teeta
Gastrochilus longiflora
Ilex khasiana
Luvunga scandens
Madhuca insignis
Paeonia emodi
Panax pseudoginseng
Rheum nobile
Saussurea simpsoniana
Taxus wallichiana
Valeriana wallichii

Rest of North-East region

Elaeagnus conferta ssp. *dendoidea*
Euonymus assamicus
Kalanchoe roseus

Deccan Plateau

Decalepsis hamiltonii
Embelia acutipetalum
Heracleum rigens
Myristica dactyloides
Shorea tumbuggaia
Ulteria salcifolia

Desert

Tecomella undulata
Commiphora mukul
Commiphora wightii
Calligonum polygonoides

Sources (collated by U. Dhar): Ahmedullah 2000; Sastry and Chatterjee 2000; Sinha 1997

- v. Register and support private, university, and other institutional botanical gardens, which provide a valuable complementary service to the official network of gardens;
- vi. Encourage small botanical gardens at village, taluka, and/or district level, with a predominant focus on local/indigenous species, and with a strong component of public education;
- vii. Set up an information exchange and networking system amongst all the botanical gardens and other *ex situ* plant collection centres, including both governmental and private/NGO/institutional ones;
- viii. Review the status of potential sites for reintroduction, and take steps necessary to restore these sites if degraded; while doing this, keep in mind the survival and livelihood dependence of traditional communities in such areas;

Ongoing Relevant GOI Schemes/Programmes:

- MoEF: (i) Botanical Survey of India, Zoological Survey of India established under Survey of Natural Resources Programme, (ii) Assistance to Botanical Gardens Scheme under Conservation of Natural Resources Programme.
- Central Scheme for Development and Cultivation of Medicinal Plants of the Department of Indian Systems of Medicine and Homeopathy.
- Establishment of *Vanaspati Vanas* Scheme, under Department of Indian Systems of Medicine and Homeopathy
- Operational Guidelines for Financial Assistance Scheme under National Medicinal Plants Board
- Societal Programmes, Department of Science and Technology.
- (i) Medicinal and Aromatic Plants component under sub-programme of Biodiversity Conservation under Research and Development Programme, and (ii) Biotechnology Based Programmes for Society, of the Department of Biotechnology.

2. Promote the Use of Home/Terrace/Kitchen/Institutional Gardens to Cultivate Threatened and Endemic Wild Plants

Provide incentives and support to rural and urban households, educational and academic institutions, rural groups and NGOs, which have a plot of land or a terrace/roof, to grow plants which are endemic or seriously threatened in the wild. If necessary, enter into an arrangement for buy-back, or support some other productive use of the saplings nurtured by the households. Learn from ongoing programmes such as the promotion of kitchen health gardens in over 100,000 households in south India.

Justification: There is a vast network of home, terrace, and kitchen gardens already existing in India, but it has not been tapped for its potential to propagate endemic and threatened plants. Within a short period, this could become an activity with a mass base, given the necessary initial inputs from government agencies and NGOs.

Suggested Responsibility: Residents' associations, community institutions, home/terrace/kitchen garden associations, self-help groups, botany departments of academic institutions, schools, municipal authorities, with support from conservation NGOs, state Forest Departments, urban environment departments, Ministry of Rural Development, Ministry of Urban Affairs, Department of Indian Systems of Medicine and Homeopathy, and National Medicinal Plants Board.

Time Frame: Ongoing

Steps:

- i. Identify potential households and communities, associations, schools, and institutions that could form the nucleus of such work;
- ii. Prepare adequate number of saplings and seedlings of endemic and threatened species (including indigenous trees) be provided to these communities and institutions;
- iii. Develop (or showcase where already existing) a range of model gardens for different biogeographic, cultural, and economic conditions (including urban situations)
- iv. Facilitate exchanges of plant material and information amongst these households, communities and institutions, and the creation of networks in each region and city/town;
- v. Promote cultivation of threatened and endemic species in schools as an ongoing exercise for students, and facilitate inter-school exchanges for this;
- vi. Support one or more newsletters to be brought out by these networks;
- vii. Institute prizes and other incentives for outstanding work done in this field.

Ongoing Relevant GOI Schemes/Programmes:

- Implementation through NGOs, and Information Education and Communication Scheme, Department of Indian System of Medicine and Homeopathy.
- Community Forestry Projects under International Corporation Wing, Ministry of Rural Development.

3. Strengthen the Use of Botanical Gardens and Other *Ex Situ* Repositories as Seed Banks for Various Biogeographic Regions

Enhance the role of botanical gardens and other *ex situ* facilities such as the National Bureau of Plant Genetic Resources, to conserve and disseminate seeds of wild plants from (including indigenous tree species) various biogeographic regions. Set up at least one such centre for each biogeographic region.

Justification: There is as yet no systematic programme to store seeds or other reproductive material of wild plants for research and replanting purposes. Botanical gardens and *ex situ* gene banks can play this role.

Suggested Responsibility: MoEF with Ministry of Agriculture (in particular the NBPGR), with state departments handling botanical gardens and gene banks.

Time Frame: Ongoing.

7.1.3.3 Strategy: Strengthen Culture Collections of Micro-Organisms

Actions

1. Consolidate Information on Existing Culture Collections, Strengthen These, and Build Up Further Collections

The existing information about microbial biodiversity in the country needs to be consolidated in view of the scattered information available with various organizations. It should be categorized into a nationally available document that identifies the cultures at least to the species level; this should be made available/accessible to the public. This should then be followed up by authentication of cultures and augmentation of the culture collections by isolating more cultures, especially from the neglected genera. It should also be ensured that all the cultures are deposited in not just one but preferably two central culture collections.

Suggested Responsibility: Institute of Microbial Technology, National Bureau of Agriculturally Important Micro-organisms, and National Bioresources Development Board, along with other national and regional institutes (including universities) holding culture collections.

Steps:

- i. Collate information from all existing culture collections in the public and private domain, prepare a single consolidated, web-accessible database, and identify major gaps;
- ii. Study pristine or unusual habitats such as marine ecosystems, natural and artificial salt pans, natural lake systems, natural forest areas, mining areas, glaciers, hot springs, etc., and collect micro-organisms from these for culturing;
- iii. Study and collect adapted micro-organism diversity in human-made ecosystems, including areas affected by industrial effluents, domesticated agricultural areas, oil deposits in marine and coastline areas, and so on;
- iv. Study and collect micro-organisms within other living organisms, such as gastro-intestinal tracts of ruminants and non-ruminant herbivorous animals;
- v. Document the utility of the available micro-organisms and their availability in culture collections;
- vi. Document the benefits of various microbial cultures for research, academic studies, industrial and agriculture application, etc. In particular, document potential for utilization for various industrial and agricultural operations, including useful cultures such as biofertilizers, biopesticides, etc. for soil reclamation, mushroom cultivation, and other activities, benefiting small-scale and rural enterprises. Use of existing microbial process in various regions also has to be documented for protection of knowledge as well as their widespread benefits;
- vii. Strengthen the national and international exchange of information regarding availability of microbial cultures and their characterization, while ensuring that issues of biopiracy and benefit-sharing are fully integrated into the exchange programme;
- viii. Build capacity of collection personnel to identify and handle micro-organisms, using the latest tools available.



Ongoing Relevant GOI Schemes/Programmes:

- Initiatives planned by the recently established National Bureau of Agriculturally Important Micro-organisms (NBAIM), under the Ministry of Agriculture.
- The programme of Digital Inventorisation under the Resource-Based Projects, National Bioresources Development Board.
- CSIR network project on microbial culture collections.

2. Set Up New Culture Collection Centres

Set up culture collections at selected sites with state-of-the-art infrastructure and qualified/trained personnel, ensuring biogeographic representation in the location of the collections. At least one or two of these culture collections should be recognized by the International Depository Authority under Budapest Treaty, so that deposits can be made within the country as part of the patenting procedure.

Justification: The current network of culture collections is not fully representative of the range of micro-organism types. This network therefore needs to be augmented.

Suggested Responsibility: MoEF, Ministry of Agriculture and Ministry of Science and Technology, along with relevant institutes already holding culture collections.

Steps:

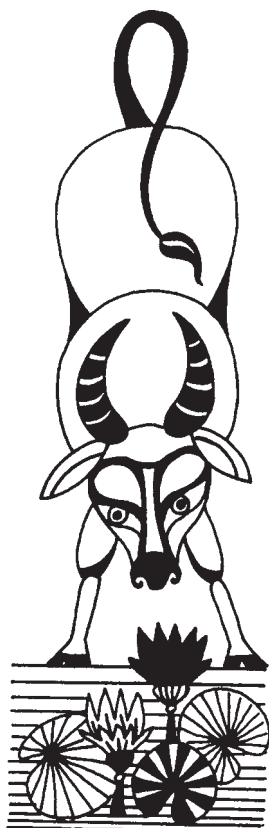
- Set up centres of culture collections with full infrastructure facilities as per international norms, at biogeographically representative locations.
- Network these centres with institutions already working in this area.
- Ensure long-term funding for culture collections.
- Build on initiatives (including a microbial gene bank proposed in the 10th 5-year Plan) planned by the National Bureau of Agriculturally Important Micro-organisms (NBAIM), Ministry of Agriculture.

7.1.4 Wild Biodiversity: Strategies and Actions for Sustainable Use and Livelihoods

(This chapter should be read in conjunction with the *Wild Animal Diversity, Wild Plant Diversity, Natural Terrestrial Ecosystems, Natural Aquatic Ecosystems, Micro-organisms, and Livelihoods, Lifestyles and Biodiversity BSAPs*. Sub-thematic reviews prepared under NBSAP, relevant to this chapter, are referred to within the relevant action point. See also *Section 7.1.1.1, Action 7*, regarding research to determine sustainable use levels.)

Overall strategies:

- Integrate sustainability and biodiversity conservation principles in all natural resources use programmes**, through participatory assessments and monitoring, encouragement of a mix of appropriate traditional and modern methods, and other such measures. This should cover fisheries, forestry (including JFM and plantations), and other natural resource use practices by government agencies, communities, corporate bodies and individuals.
- Ensure sustainable and secure livelihoods based on biological resources**, including artisanal and medicinal plant-based livelihoods. Revive sustainability where traditional livelihoods have become destructive, or facilitate the change to alternative livelihoods. Facilitate bioresource-based enterprise amongst communities.
- Ensure that tourism and pilgrimage are ecologically and socially sensitive**, with local communities as the primary beneficiaries and managers.



7.1.4.1 Strategy: Integrate Sustainability Principles into All Resource Use Policies, Laws and Programmes

Actions

1. Ensure Legal Backing to Sustainable and Equitable Use

Build into appropriate policies and laws (see also *Section 7.1.8*), the stipulation that all uses of biological resources should conform to the following principles and practices:

- i. They are sustainable for the resource concerned, in that viable populations of this resource are conserved;
- ii. They do not have an adverse long-term impact on the area's biodiversity, and on other species dependent on the resource being used; for this purpose, a distinction should also be made in these policies and laws between biodiversity and biological resources, as defined in the Biological Diversity Act, 2002 (see Definitions);
- iii. They do not undermine the existing customary rights and bonafide needs of local communities, and, in the case of resources under their jurisdiction, are undertaken only with the prior free and informed consent of those who are most dependent on these resources (for which appropriate decision-making powers and controls must vest with the community, as laid out in *Section 7.1.5*).

Justification: Considerable exploitation of biological resources is today done without any comprehensive policy, regulatory and legal mechanism to ensure its sustainability and equitable nature. This adversely affects the long-term survival of these resources, as also local community's needs and rights. Typical of this are the policies and legislation relating to minerals, fisheries, water, and other natural resources, as also those relating to the agricultural, industrial, and commerce sectors. A lack of harmonisation between the domestic laws and export-import provisions also leads to problems, e.g. the laws governing exploitation of medicinal plants from forest areas are not necessarily conducive to enforcing a check on over-exploitation of the medicinal plants that are on the negative list of exports. Policy and legal backing is therefore needed for enforcing and encouraging sustainable use. Clear stipulations on sustainable use are also needed to effectively implement the relevant portions of the Biological Diversity Act.

Suggested Responsibility: Ministry of Environment and Forests, Ministry of Commerce, and Ministry of Agriculture, along with state agencies such as the respective Forest Departments and relevant institutions working on terrestrial and aquatic resources.

Time Frame: Three years.

Steps:

(to be read in conjunction with the specific actions/steps recommended for terrestrial and aquatic ecosystems/resources, in *Strategies 7.1.4.2 and 7.1.4.3*).

- i. Review existing policies, laws, and programmes to determine what provisions need to be added to each of these;
- ii. Revise the relevant policies, laws and programmes to integrate these provisions.

7.1.4.2 Strategy: Ensure Sustainability of Aquatic Biological Resource Uses

Actions

1. Reassess Fishery and Non-Fishery Aquatic Stocks

Undertake fresh assessments and feasibility studies of the population and productivity of each species that is harvested from freshwater and marine aquatic systems, with a view to ascertaining the sustainable harvest levels. Thereafter, periodically update these assessments. Ensure coordination of the work of various wetland and marine research institutions.

Justification: The optimum aquatic product yield is determined by biological productivity, fishing/harvesting techniques, and other factors. During the last 5-6 years the fish yield from India's coastal waters has been stagnating, and





in some cases there are declines, as indicated globally and nationally through the Living Planet Index (see Box 5.1). This could either be due to improper assessment of fisheries potential or improper estimates of tertiary yield, or because of optimum yield levels have already been reached. In any case, new assessments of biological productivity and fish/aquatic species population parameters are needed to ensure a sustainable harvest. This requirement applies to both marine and freshwater fish stocks and other non-fishery products like seaweeds.

Suggested Responsibility: With respect to marine waters and coastal wetlands, institutions like National Institute of Oceanography and Central Marine Fisheries Research Institute with the Department of Ocean Development; in the case of freshwater bodies, state Fisheries Directorates/Departments or local Universities in collaboration with Central Inland Fisheries Research Institute, Central Institute of Freshwater Aquaculture, and Central Institute of Brackishwater Aquaculture.

Time Frame: Five years

Steps:

- i. Reassessment of primary and secondary productivity of coastal waters and the transfer coefficients, which taken together, will give the yields of fish and non-fish aquatic species;
- ii. Modeling energy flow and prediction of aquatic product yields, through fishery and oceanographic modelers;
- iii. Fresh models for exploited stocks, reviewing the population parameters being currently used and updating them;
- iv. New models for non-conventional fish stocks, especially in the area more than 50 km offshore (this area accounts for about 75-80% of the EEZ), offers a fishery potential the size of which is unknown at present. This can be computed based on primary and secondary production estimates and energy transfer coefficients;
- v. Periodic assessment updates every 5 years; for this, mechanised boats should be required to submit their catch data to the Fisheries Department.

Ongoing Relevant GOI Schemes/Programmes:

- Assessment of Marine Living Resources sub-programme, of the Marine Living Resources Programme of the Department of Ocean Development.
- Integrated Coastal and Marine Area Management (ICMAM) project under Department of Ocean Development.
- Island Development sub-programme under the Coastal Community Programme of the Department of Ocean Development.

2. Develop Harvest Strategy for Non-Conventional and Deep-Sea Fishery Resources, Based on Stock Assessment

Make fresh assessments of the total stock of fishery resources in the deep seas, and also of the non-conventional fisheries.

Justification: Assessing the yield from the marine fishery sector, it is apparent that the yields along both the coasts (except for certain regions) are stagnant since the last several years and are already close to the optimum yields estimated from several different models. It is expected that, irrespective of the developments in coastal mariculture, demand for captured fishes would increase.

Suggested Responsibility: Fisheries Survey of India and CMFRI in collaboration with fisherfolk associations.

Time Frame: 10 years

Steps:

- i. Comprehensive surveys in the waters beyond 50 m depth line and up to the edge of EEZ for edible fish stocks that can be used as alternate protein sources;
- ii. Development of a realistic strategy to harvest these resources with indigenous means and humanpower, giv-

ing priority to employment and livelihoods of traditional fisherfolk, by building their capacity and scrapping the policy of encouraging trawlers under joint ventures with foreign collaboration.

3. Upgrade Traditional Fishing Gear with Appropriate Technology

Build upon traditional fishing gear and technologies, upgrading them in ways that retain their ecological sophistication while increasing their efficiency. Ensure that no traditional fisherperson in the process is displaced, and that the new technologies or modifications are sustainable. Introduce new technologies that help reduce the accidental catch or damage (such as Turtle Excluding Devices – TEDs), and that aid in extending the reach of the small fisherperson to deeper waters.

Justification: The traditional fishing gears, can be upgraded to become more catch-efficient while maintaining their characters of causing minimum ecological damage.

Suggested Responsibility: Ministry of Science and Technology and CMFRI, in collaboration with academic and advocacy institutions like CDS, NFF, ICSF, and other community institutions, traditional science and technology networks like PPST, and design schools like National Institute of Design, and Industrial Design Centres of various IITs.

Time Frame: 5 years

Steps:

- i. Document the types of fisheries gear already in use in different communities;
- ii. Undertake scientific studies to upgrade and integrate traditional fishing gears with appropriate modern technology, and complement existing technologies with devices such as TEDs, to help reduce damage to non-target species;
- iii. Introduce the technologies in representative areas and communities, through fisherfolk institutions, and based on the lessons therefrom, spread to other areas and communities;
- iv. Grant clear common property rights regulated by community-evolved norms for use of such improved gears to ensure sustainable harvest.

4. Revise Existing Fishing Regulations and Initiate innovative Implementation

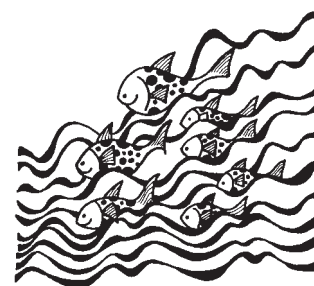
(See also Section 7.1.8.4)

Review and revise, as necessary, current fishery regulations, and ensure their implementation through innovative mechanisms.

Justification: At present the fisheries sector in India is regulated by a large number of rules framed both at the central and state levels. While striving for a positive regulation of fishing activities, some rules have become redundant, and certain others are liable for misinterpretation and misuse. A case in point is the recent total ban on all shark fishing, followed by a relaxation confining the ban only to certain species. The total ban was based on a misunderstanding that all shark species were threatened. But the relaxation, in the absence of safeguards like training fisheries inspectors to recognize the endangered species, could in turn be misused, with the protected species getting caught indiscriminately. Thus there is a need for a revision of all fishery-related rules and their integration into one Fishing Regulation Act (FRA), with separate sections for freshwater and for marine areas (including the entire EEZ). This is also necessary to stop the indiscriminate exploitation of marine resources by the mechanized trawler sector, which has been destroying coastal biodiversity, coastal livelihoods and traditional fishing practices. In addition, the current vast gap between policy framers and policy users, which provides little voice to primary stakeholders, needs to be bridged.

A Marine FRA (to be enacted at the Centre) has already been recommended by the Majumdar Committee (1978) and Murari Committee (1997).

Suggested Responsibility: Ministry of Agriculture (Department of Fisheries) in collaboration with state Fisheries Departments/Agencies, and fisherfolk associations, with help from the institutions listed in Action 1 of this section.



Time Frame: 3 years

Steps:

- i. Ministry of Agriculture to set up a committee to review, in a consultative manner, the existing fishery regulations, and integrate them and new provisions into a Fishing Regulation Act; this Committee involving representatives from Central and State Fisheries Departments and Agencies and representatives from user groups, especially traditional and small-scale/artisanal fisherfolk (including fisherwomen), including their federations like National Fishworkers Forum;
- ii. Harmonising of the Import-Export Policy with the FRA, including measures to ensure that all trade follows sustainable harvest regulations and other principles laid down for commercial uses, in *Strategy 7.1.4.2*;
- iii. Translation of all current regulations, and of the proposed FRA, into regional languages, supplemented by visual illustrations; other innovative measures in the extension services of state Fisheries Departments, so that the rules are understood by most women and men stakeholders and adhered to in letter and spirit.

5. Regulate Over-Capitalization

Regulate capital investments in the public and private sectors, in marine fisheries development, based on harvestable marine fish stocks and the socio-economic needs of the coastal communities. Enforce a number of steps to ensure that capital and other investments in fisheries do not result in overfishing or wasteful harvests.

Justification: One of the main causes for loss of marine biodiversity is intensive exploitative practices evidenced by non-adherence to a code of responsible fishing that includes regulations of mesh size, prohibited depths for trawling, utilization of devices like TED and so on. The stagnant (and in some states dwindling) yields have also led to over-capitalization (over-investment in terms of infrastructure and manpower capacity) in certain sectors in order to increase the economic returns in the short term.

In fisheries terms, CPU (catch per unit effort) indicates the amount of fish caught when a boat of certain size, with certain number of personnel on board, using a certain type of gear, operates for a certain number of hours a day. Optimum yield being more or less constant, increasing the denominators (boat numbers, length of operation) is likely to lead to an eventual decline in the catch. This becomes a vicious circle – having invested heavily and faced with dwindling returns, the operators increase the efforts, leading to further decrease in catch. Over-investment has thus been the cause of collapse of several fisheries worldwide. The practice of over-capitalization also alienates the traditional fisherfolk as they are presumed to be incapable of using modern means of fishing.

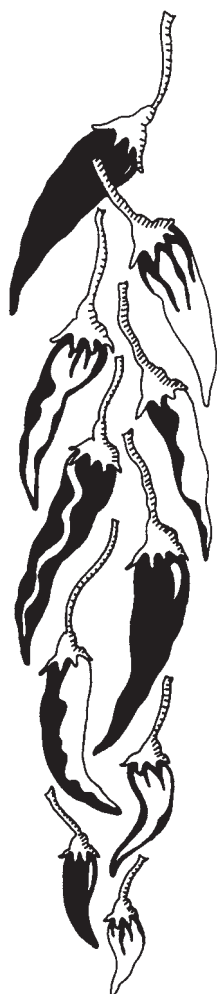
Suggested Responsibility: State Fisheries Departments, with guidance from Ministry of Agriculture, MoEF, and institutions with relevant expertise on fishing technologies.

Time Frame: Ongoing

Steps:

Formulate standards and guidelines for the following, and implement them:

- Restriction of the number of mechanized boats operating in a sector, and appropriate zonal regulations, with widespread awareness generation about the reasons for and impacts of such restrictions/regulations;
- Imposition of a permit system;
- Adoption of a quota system, determined scientifically and voluntarily adopted by traditional fisherfolk;
- Restriction of the hours of operation;
- Restriction of the type of gears used, and the stipulation that only owner-operators have the right to own fishing gear, and encouraging the use of devices like TEDs (indigenously manufactured and within the economic reach of traditional fisherfolk);
- Restriction of the number of processing units on the shore;
- Restriction of lending by financial institutions to the mechanized fisheries sector.



6. Enforce a Uniform Ban on Monsoon Marine Trawling, While Monitoring Its Efficacy

Enforce a uniform ban on monsoon trawling across the maritime states. Simultaneously assess, through a participatory process especially involving traditional fisherfolk, the relative merits of a staggered (north to south) *vis-à-vis* uniform ban on monsoon trawling in marine areas. Continue the ban or make appropriate seasonal/spatial changes according to the results of the assessment.

Justification: The monsoon is the period when most marine fishes reproduce and the juveniles come inshore for feeding on the high detritus brought in with the freshwater. Trawling in inshore waters, often with very fine mesh, destroys breeding stocks and juveniles. Several maritime states have proposed ban on monsoon trawling, but till recently the periods when the ban becomes effective were not the same between the states. This defeats the very purpose of the ban, since trawler owners and fisherfolk migrate to adjacent states and continue fishing legally. A uniform ban has reportedly been announced in 2003, the impacts of which can be monitored for further decisions regarding this.

Suggested Responsibility: Ministry of Agriculture, in collaboration with maritime state Fisheries Departments and traditional fisherfolk associations

Time Frame: Two years

Steps:

- i. Ministry of Agriculture to evaluate, in consultation with traditional fisherfolk associations, the desirability of both the approaches (a staggered approach or a uniform ban); and commission studies of fish catch patterns at different maritime states.
- ii. Circular to be issued to all maritime states, to follow the regulations decided upon.

7. Ensure the Sustainability of Aquaculture

Integrate biodiversity and biodiversity-based livelihood concerns into all aquaculture operations, and encourage traditional, non-intensive methods that are ecologically sustainable, in place of modern, intensive, destructive methods. Restrict aquaculture to traditional fisherfolk communities, and ensure that a diversity of species are used.

Justification: Intensive aquaculture practices are not only harmful to the environment but also preclude livelihood options for local fisherfolk, and therefore need to be phased out. There is also continuing erosion of more sustainable traditional aquaculture methods, and hence a need to encourage, revive, and innovate upon these.

Suggested Responsibility: State Governments, Fisheries Department, MPEDA, PRIs, fisherfolk associations/federations, Ministry of Science and Technology (including Department of Biotechnology), and CMFRI, for promotion of sustainable aquaculture practices; Government of India for legal measures.

Time Frame: Switch to sustainable practices within 5 years; legal measures to be taken as urgently as possible.

Steps:

- i. Promote traditional and modified traditional aquaculture practices to enhance livelihoods of communities dependent on the resource. For this, it is essential that:
 - Funds and technical support are provided for traditional and improved traditional methods used by resource-dependent communities;
 - Marketing support is provided to the community through existing institutions like MPEDA;
 - Monitoring systems are created to ensure that these practices do not create pollution, saltwater intrusion or cause other changes in land use patterns like conversion of agricultural fields;
 - Norms are evolved with communities, PRIs, and state fisheries departments to ensure sustainable practices.
- ii. Withdraw the Aquaculture Authority Bill (*see Strategy 7.1.8.9*), and phase out intensive and industrial aquaculture farms as ordered by the Supreme Court.



Ongoing Relevant GOI Schemes/Programmes:

Science and Technology for Women Scheme under Societal programme, Ministry of Science and Technology.

8. Add Value to Catch and By-catch

Develop methods to add value to catch and by-catch, so that wastage is converted to useful products, and further livelihood options are generated.

Justification: Most of the by-catch after trawling operations is simply discarded, and often the main catch is also under-valued. In the case of high-value targeted fisheries, the quantum of by-catch generated is substantial. Utilising this would help reduce overall harvest of resources and provide better returns for fisherfolk. Providing better facilities to reduce post-harvest losses and improve storage and value-addition would considerably aid in improved livelihoods. However, utmost care has to be taken that this does not lead to over-exploitation, and does not encourage, or become an excuse for, wasteful technologies and practices.

Suggested Responsibility: Relevant fisheries technology development institutes and departments, fisheries colleges, and community experts, with support from state Fisheries Departments.

Time Frame: 5 years.

Steps:

Develop cottage-level industries and processes that would incur low investment and operational costs and yet generate decent income for communities, especially womenfolk; for such development, learn from the system of processing by-catch into fish meal that is already known and practiced at some landing sites in India.

Ongoing Relevant GOI Schemes/Programmes:

(i) Drugs from Sea Project under Marine Living Resources, and (ii) Island Development sub-programme under Coastal Community Programme, of the Department of Ocean Development

9. Move All Freshwater Wetlands Towards 'Wise Use'

Ensure that freshwater wetlands in the country move towards a 'wise use' system that ensures the conservation of their biodiversity and the sustainable use of their resources, through studies and monitoring, empowerment and facilitation of community management, and appropriate policy/legal measures.

Justification: Most freshwater wetlands in the country are in a serious state of degradation, due to a range of factors (see Sections 4.1.1 and 5.1). Biodiversity and livelihood loss is therefore a major concern. Unfortunately there is no systematic programme tackling this problem in a holistic fashion at the landscape/waterscape level through participatory means. Given the enormous ecological, social, and economic values of wetlands, these issues need to be urgently dealt with.

Suggested Responsibility: MoEF, MoWR, MoA, state departments of environment, forests, water, irrigation, fisheries, and other relevant ministries and departments, in association with local NGOs, PRIs and urban wards, with support and guidance from Central Institute of Brackishwater Aquaculture, Central Inland Fisheries Research Institute, Central Institute of Freshwater Aquaculture, ZSI, BSI, BNHS, SACON, Wetlands International, JNU's Centre for Environmental Studies, WWF-I, and other wetland groups and experts.

Time Frame: 5 years for initial representative set of sites; ongoing for the rest thereafter.

Steps:

- i. Conduct baseline surveys of the resource availability in each key wetland, the current uses and community associations, the status of critical biodiversity elements (especially threatened species), and other parameters



that are important for ensuring conservation and sustainable use; base these surveys on the national surveys coordinated by SACON and WII (MoEF/UNDP projects);

- ii. Frame an overall management plan for each wetland (which also includes at least its immediate catchment area), to ensure that the determined levels of sustainability are not overstepped, that the basic characteristics of the wetlands are maintained, and that critical biodiversity elements are conserved;
- iii. Strengthen or create democratic institutions of local fisherfolk and other communities (including community irrigation/water committees), to implement the management plan in conjunction with relevant line departments and others; this to be accompanied by generating widespread awareness of the ecological and economic benefits of wetlands;
- iv. Empower communities through PRIs/gram sabhas, to remove encroachments on wetland areas;
- v. Ensure the livelihood security of local wetland dependent women and men, through appropriate institutional, economic, technical, capacity-building and other measures.

7.1.4.3 Strategy: Ensure Sustainability of Terrestrial Biological Resource Uses

Actions

1. Ensure that All Official Forestry Management Practices Integrate Biodiversity Concerns

Strengthen biodiversity and sustainability concerns in official forestry management operations, including the felling, thinning, plantation and regeneration operations that are prescribed in Working Plans. This would imply that:

- i. All such operations strive to maintain or revive the essential natural structure of the forest, and sustain the viability of both the species being worked and of other species dependent on these;
- ii. Such operations integrate the needs and rights of forest-dwellers who are dependent on the forest for their livelihoods and survival;
- iii. Traditional and new methods of ensuring sustainability, including those developed by forest-dwelling communities, be fully integrated and built upon;
- iv. Effective means be found to nurture/facilitate sustainable harvesting methods for different species (e.g. Indian Institute of Science suggests that 50% of fruits and reproductive parts be left intact), including through appropriate awareness generation amongst collectors, traders and officials, and publicising/notifying the maturity date for collection/harvesting;
- v. Plantation and regeneration programmes be oriented towards indigenous species that harbour indigenous biodiversity and are especially useful to the underprivileged women and men of local communities, and completely phasing out the use of exotics from natural ecosystems (see also separate point on sustainable plantations below);
- vi. Demand management becomes a major component, especially to reduce the demand for, and find alternatives to, industrial and urban uses of wood that cannot be easily met through farm forestry and private plantations (including the development of low density plantations of fuel/fodder species in and around settlements, while ensuring that these do not impinge on non-forest ecosystems);
- vii. Possibilities of improving tree productivity in controlled conditions, without affecting dependent biodiversity or otherwise damaging the ecosystem, be explored for timber, fuel, fodder and NTFP species;
- viii. There be an appropriate thrust to agroforestry, especially relevant for *jhum* areas or villages within forests (see Box 7.2.4.5; see also *Livelihoods, Lifestyles and Biodiversity Thematic BSAP*);
- ix. There be a significant upscaling of action to generate livelihoods through regeneration and afforestation of degraded lands (Planning Commission Task Force Report).

Justification: Past and ongoing official forestry practices have been heavily oriented towards yield of commercial timber and other wood, undervaluing biodiversity concerns. Some components of forestry have indeed been among the major causes for the loss of biodiversity (see Section 5.1.1.1). Increasingly, it has been realised that it is in India's long-term social, ecological, and economic interest to ensure sustainability of all forest uses. Elements of this are also emphasised in the National Forestry Action Plan (see Box 7.1.4.1).

Suggested Responsibility: Ministry of Environment and Forests to lead, in collaboration with the Ministry for



Rural Development, Ministry of Science and Technology, State Forest Departments, relevant forest and wildlife research institutes, and relevant NGOs and community groups in the field.

Time Frame: One year for the guidelines (see below); 5 years for implementation.

Steps:

- i. MoEF to set up an expert group to work out detailed guidelines on ways to ensure sustainability in forestry operations; the group should consist of representatives from ICFRE, WII, IIFM, state forestry research institutes, and community groups that have demonstrated traditional or innovative ways of ensuring sustainability; the group's membership should ensure gender balance;
- ii. These guidelines could build on existing work by institutions, such as the criteria and indicators developed by IIFM;
- iii. The draft guidelines should be widely disseminated for feedback and inputs prior to finalisation;
- iv. MoEF to issue a notification, under the Indian Forest Act or Forest (Conservation) Act, to all states to implement the guidelines;
- v. Each State Government to set up a Sustainable Forestry implementation and monitoring committee, consisting of the Forest Department and other relevant departments, NGOs working on forests/biodiversity and community issues, and relevant community groups, to oversee and monitor the implementation of the guidelines, and to present reports to MoEF and state governments;
- vi. Appropriate mechanisms to be built into each Forest Working Plan (which should be renamed 'Forest Conservation and Management Plan'), building capacity of local community institutions and frontline staff to implement and monitor the achievement of the guidelines.

Ongoing Relevant GOI Schemes/Programmes:

- The MoEF's (i) National Afforestation and Eco-development Board, and (ii) Grants-in-aid Scheme for Voluntary Agencies National Afforestation and Eco-development Board.
- Other Schemes of Wasteland Development Programme, Ministry of Rural Development.
- The Societal Programmes, Ministry of Science and Technology.

Box 7.1.4.1 National Forestry Action Plan

The basic purpose of the NFAP is to establish a direct linkage between national forest policy and the national five-year plans. The programmes under the NFAP include:

1. **Protect Existing Forest Resources:** Main sub-programmes: (i) Forest Protection, (ii) Soil and Water Conservation, and (iii) Protected Areas and Biodiversity Conservation. These include forest survey, demarcation and mapping, inventory, biodiversity conservation, protected area management, protection against poaching, encroachment, fire etc., and other related issues.
2. **Improve Forest Productivity:** Main sub-programmes: (i) Rehabilitation of Degraded Forests, (ii) Research and Technology Development, (iii) Development of NWFPs, and (iv) Assisting Private Initiatives with Community Participation. These mainly involve research improvement in technology, enrichment planting, soil and water conservation, regeneration, rehabilitation, and afforestation, mainly in existing forests.
3. **Reduce Total Demand:** Main sub-programmes: (i) Fuelwood and fodder, (ii) Timber, and (iii) Programmes for reduction of demand placed on forests through the technology of preservation, seasoning, substitution and other measures for the efficient utilisation of forest products and also through extensive biomass plantations.
4. **Strengthening Policy and Institutional Framework:** This includes the development of infrastructure like buildings, communications etc. and strengthening of staff (including HRD). This issue also covers all aspects of capacity-building, forest policy and legislation, public forest administration and organisational structure, research and budgeting etc.
5. **Expand Forest Area:** Main sub-programmes: (i) Tree plantations on forest and non-forest lands, and (ii) People's participation in plantations and their protection.

2. Ensure that Biodiversity Concerns are Built into Community Uses of Forests and Other Natural Ecosystems

Integrate biodiversity and biodiversity-based livelihood concerns into all local community uses of natural terrestrial ecosystems and their products. This would include the local and wider consumption of timber, fuelwood, non-timber forest produce, aquatic produce, etc., as also activities like grazing and shifting cultivation. Particular attention needs to be paid to areas where human and livestock demands are much greater than can be met from the local ecosystems, or where their traditional practices have been modified and become unsustainable.

Justification: While at some time in the past local community uses of ecosystems and natural products may have been sustainable, at many places various factors (outlined in *Sections 5.1 and 5.2*) have brought them to unsustainable levels. At times villagers are also conduits for the large-scale demand of forest produce from cities and industries. A series of measures is needed to encourage sustainable uses while finding alternatives for what has become inherently unsustainable; this would include not only technical alternatives but also tackling the root causes of unsustainability including alienation of lands, and others outlined in *Section 5.2*.

Suggested Responsibility: PRIs and other community institutions, with support from MoEF, MoRD, Ministry of Science and Technology, TRIFED, Ministry of Tribal Affairs, State Forest Departments and other such agencies, as also NGOs.

Time Frame: One year for framing guidelines (same as in Action 1 above); 10 years for implementation.

Steps:

(As in the case of *Action 1* above, except that all actions should be undertaken by community-led institutions, with facilitation by the Forest Department, other relevant departments, and independent experts; with respect to grazing, see also recommendations on proposed Grazing Policy, *Strategy 7.2.8.2, Action 2*; and recommendations on shifting cultivation, *Strategy 7.2.4.3, Action 1*).

Ongoing Relevant GOI Schemes/Programmes:

- MoEF: (i) Conservation and Development of Non-Timber Forest Produce including Medicinal Plants, under Regeneration and Development
- The Science and Technology Application for Rural Development under societal Programmes of Department of Science and Technology
- MoTA: (i) Grant-in-Aid to State Tribal Development Co-operative Corporations and Other Such Organisations (ii) TRIFED

3. Assist private owners of natural forests to manage their forests sustainably

Facilitate the management of privately owned natural forests (including forests within private plantations and croplands), in line with principles of sustainable use, while producing biomass/produce required for their own use or for the market. The management practices should ensure that biodiversity concerns are integrated and that overall land use does not change.

Justification: Sizeable chunks of privately owned natural forests (including within tea/coffee/other plantations and croplands) exist in different states, especially in the Western Ghats, central Indian forests, and the north-eastern states. In such lands, the bio-resource either remains locked, or the benefits from such resources hardly accrue to their owners on account of complex laws. Experience from the Western Ghats suggests that plantation owners are adopting various means to reduce natural forest cover on their lands (leased and owned) and in a few cases even trying to convert the land use wholesale from forest to non-forest. The initiative taken in Madhya Pradesh through the Lok Vaniki Act, to help the farmers benefit from such bio-resources, is a useful beginning (see *Section 6.1.4.2*) that needs to be further built upon.



Time Frame: Assessment in two years, other steps ongoing.

Suggested Responsibility: Private landowners with guidance and support from state Forest Departments and other relevant agencies, local and national NGOs, and neighbouring communities.

Steps:

- i. Assess and collate state-wise extent and ownership of natural forests on private land holdings;
- ii. Assess the status and biodiversity values of these forests, giving due consideration to local/indigenous knowledge and criteria for determining biodiversity values;
- iii. Assess adequacy of policy and legal framework to identify the bottlenecks in sustainable management of such forest with sufficient economic return;
- iv. Improvise and adapt Madhya Pradesh's Lok Vaniki legislation (*see Section 6.1.4.2*) for use in other states to assist the farmers in maintaining and managing their natural forests for sustainable economic and ecological returns;
- v. Consider other incentive measures, such as social recognition and awards, promotion of ecologically and socially sensitive tourism, or financial assistance, for such conservation and sustainable management;
- vi. While facilitating the above, put in place safeguards to ensure that the biodiversity values of the forest are not diminished.

4. Ensure that Biodiversity Concerns are Integrated into Tree Plantation Activities

Integrate biodiversity and biodiversity-based livelihood concerns into all tree plantation activities, including commercial tree plantation, compensatory afforestation, joint forest management, social forestry, and private and corporate forestry. This would include the following principles:

- i. As far as possible, indigenous species should be used, and no exotics should be introduced into an existing natural ecosystem;
- ii. Plantation activities should be sensitive to the ecological values of the area, including ecosystem benefits such as water catchment, wildlife values such as corridors and refugia, integrity of non-forest natural ecosystems like grasslands, etc.;
- iii. Compensatory afforestation should be in ecological contexts and with species that are the same, or as close as possible to, the ecological contexts and species that are being lost;
- iv. Management of the plantations, the species planted, and other related activities should be mindful of the needs and rights of local communities, and in particular of women and other underprivileged sections; such management should be in full consultation with (or in the case of common lands, in the hands of) local communities, through PRIs, with appropriate facilitation by relevant government agencies;
- v. Where natural regeneration is possible, plantations should be avoided;
- vi. Industrial plantations should not be allowed on common lands of any kind (including forest lands);
- vii. On farmlands, where plantations for industrial raw materials may be permitted or encouraged, the loss of agro-biodiversity should be avoided or minimised.
- viii. Care needs to be taken to avoid using microbial inoculants or other inputs that could displace indigenous microbial or other species through altered biological equilibrium and soil changes.

Justification: Most plantation activities in the past, and many that are ongoing, have not been sensitive to biodiversity and biodiversity-based livelihood concerns. Plantations have in fact been one of the major causes for the loss of biodiversity in many parts of India (*see Section 5.1*), as also of loss of access to survival and livelihood resources by the poor. Increasingly, it has been realised that it is in our long-term social, economic, and ecological interest to ensure that plantations move towards a biodiversity and sustainable livelihoods orientation.

Time Frame: One year for the relevant guidelines, notifications and circulars (*see below*); 5 years for implementation

Suggested Responsibility and Steps: Specific actions for different situations are given in Table 7.1. These should be integrated into the implementation of all large plantation programmes for increasing the country's forest cover budgeted for during the 10th 5-Year Plan:



Table 7.1 Actions to Ensure Sustainable Plantation Activities(Partly adapted from *Plantations and Biodiversity Sub-thematic Review*)

Recommended Initiatives	Action Points	Suggested responsibility
Adopting the goal of multi-species rather than monocultural plantations	Incorporation of biodiversity principles in Working/Conservation Plan guidelines and guidelines of schemes like JFM, social forestry, and others; ensuring implementation through monitoring and evaluation involving local communities, field staff and local NGOs	Ministry of Environment and Forests to set up a working group for incorporation of biodiversity principles into all relevant guidelines; implementation through state Forest Departments and FDCs, in collaboration with forestry-related institutions, NGOs, and local communities
Ensuring that plantation activities do not harm natural ecosystems or cause biodiversity loss	Incorporation of prohibited or 'no-go' areas for plantations, such as natural grasslands and pastures, into appropriate legislation such as the Forest (Conservation) Act or Biological Diversity Act; EIAs for plantations in all other areas with the aim to avoid activities that would cause loss of existing indigenous biodiversity; this could include impacts on micro-organisms, which can be monitored at some representative sites through molecular microbial fingerprints; Introduction of a certification or labelling system for plantation produce	Ministry of Environment and Forests to issue notification under the relevant law; local government agencies, NGOs and experts, along with community institutions, to be involved with the EIAs; certification/labelling standards to be developed by BIS and MoEF through a consultative process
Ensuring that plantation activities in degraded forests are biodiversity-oriented to the extent possible	Issue of guidelines, under Forest (Conservation) Act and under wildlife management plans, for restricting plantation activities in areas where natural/artificial regeneration possibilities exists	Ministry of Environment and Forests and State Forest Departments to issue circular; implementation through relevant governmental and community institutions
Ensuring that contract farm forestry initiated by or for forest-based industries, does not cause loss of agro-biodiversity	EIA of contract farm forestry systems with special reference to impact on agro-biodiversity	State Governments to issue guidelines, and follow up through KVKs, farmers associations, and <i>gram sabhas</i> or equivalent village institutions
Ensuring compatibility with local community (particularly <i>adivasi</i>) livelihoods, culture, gender and equity issues	Planning of plantation activities by/with local communities, in particular women and other underprivileged sections; Focus on optimizing production/ generation of a variety of NTFP and biomass resources; Ensuring that the predominant share	Government of India for incorporation of these principles in plantation activities, including in JFM guidelines; implementation by village institutions with facilitation with relevant State Governments agencies including Forest Department and Tribal Welfare Department.

Recommended Initiatives	Action Points	Suggested responsibility
	of the benefits goes to the community and that benefits are distributed equitably in the community; Strict prohibition on use of common lands for predominantly (or exclusively) industrial plantations	
Providing subsidies for regeneration-based plantation activities in low root-stock areas	Regeneration of indigenous, rare and high value NTFPs through low-cost funds, and improved assistance for common upstream processing facilities	Ministry of Finance and the Ministry of Environment and Forest, State Governments, NABARD and Co-operative Banks
Importing forest products (for a temporary period) from countries with similar biodiversity-sensitive policies	Reduction of import duties on forestry products for use by Indian industries, ensuring that such imports are only for products not already available from farm forestry and JFM areas, and are only from countries which have forestry policies that are sensitive to biodiversity and sustainability issues and local community livelihood concerns; ensuring also that this is only a temporary measure, till India generates its own supplies or alternatives	Ministries of Finance, Commerce and Industry, and the Ministry of Environment and Forests in collaboration with industrial associations and accredited NGOs for identification of sources
Ensuring that compensatory afforestation is truly compensatory of the ecosystems/species being lost, and respects the rights and needs of local communities	Incorporation of guidelines in EIA and clearance procedures, whereby projects for forest diversion are only approved when compensatory afforestation schemes are (i) planned in ecosystems similar to the one being lost, and with the same species being lost, and (ii) planned with the full involvement of local communities to ensure that they do not affect the common property rights and needs of these communities	Ministry of Environment and Forests to build these guidelines into environmental and forest clearance procedures
Integrating biodiversity and gender/equity considerations into community-led plantation	Use of a mix of indigenous species, especially those known to favour wildlife, and be of use for domestic medical and other non-timber purposes, in plantations by communities	PRI and other village institutions, in collaboration with PRI training agencies, Forest Department and relevant NGOs
Encouraging the maintenance of wildlife refugia in crop plantations	Assessing the wildlife values of coffee, tea and other such plantations, and encouraging, through incentives (such as marketing in a premium niche, certification as 'eco-friendly' or	Forest Departments, NGOs, and plantation owners/companies

Recommended Initiatives	Action Points	Suggested responsibility
	'biodiversity-friendly', etc.), the protection of wilderness refugia in them	
Creating awareness and capacity for the above actions	Building these principles and actions into relevant training programmes, producing simple manuals in local languages, and facilitating exchange visits for experience-sharing	MoEF through CEE and CPREEC, regional/local environment education groups, Forest Departments and relevant corporate associations

Ongoing Relevant GOI Schemes/Programmes:

- MoEF: (i) National Afforestation and Eco-development Board, (ii) Grants-in-aid Scheme for Voluntary Agencies under Regeneration and Development
- Schemes of Wasteland Development, Ministry of Rural Development.
- The Societal programmes, Ministry of Science and Technology.

7.1.4.4 Strategy: Ensure and Facilitate Sustainable Livelihoods

(Note: This should be read in conjunction with *Strategy 7.1.5.1*, on tenurial rights to livelihood resources; see also *Livelihoods, Lifestyles and Biodiversity BSAP* for specific strategies relating to forest-dwellers, fisherfolk, and pastoralists)

Actions

1. Carry Out National Survey of Biodiversity-Based Livelihoods and Traditional Practices of Sustainability

Undertake a national-level survey of livelihoods directly based on biodiversity and biological resources from natural ecosystems, in particular to identify and assess those which have practices and principles of sustainability built into them. This would include practices related to the use of aquatic resources, forest produce, grassland resources, etc., by both settled and nomadic communities. It would also include practices that have now become unsustainable, and the factors causing this.

Justification: Though several tens of millions of people's livelihoods are *directly* based on biological resources, there exists no comprehensive all-India assessment of the extent and nature of this dependence, the changes that these livelihoods are going through, the threats faced, and the opportunities for continuing with such livelihoods. There are also very few studies that are differentiated according to gender, class, caste, age and other social factors. Such an assessment would be essential as a base document for planning the sustainability of biodiversity-based livelihoods. It should include all livelihoods including those that retain their traditional sustainability or have adapted themselves to become sustainable, and those that are currently being considered unsustainable.

Suggested Responsibility: National Sample Survey, in collaboration with local and national research institutions, universities, and with farmer/fisher/pastoralist/artisan/nomadic people's associations, including women's groups.

Time Frame: Three years

Steps:

- Frame a standardised methodology for the survey;
- Orient a team of survey leaders and participants to the methodology and the various issues involved with biodiversity-based livelihoods;



- iii. Carry out the survey through the team participants, and distribute the results after analysis to all relevant central, state, and non-governmental agencies, and to community groups/PRI in local languages;
- iv. Make such a survey a periodic feature, perhaps as part of the NSS's regular surveys, or as a part of the Census of India.

Ongoing Relevant GOI Schemes/Programmes (for This and the Other Actions in This Section):

- National Afforestation Plan, NAEB
- Central Scheme for Development and Cultivation Of Medicinal Plants, Department of Indian Systems of Medicine and Homeopathy
- Operational Guidelines for Financial Assistance through National Medicinal Plants Board Scheme, National Medicinal Plants Board
- Grant-in-Aid to State Tribal Development Co-operative Corporations and other such organizations, Ministry of Tribal Affairs
- Societal Programmes, Ministry of Science and Technology
- Biotechnology-Based Programmes for Society, Department of Biotechnology
- Integrated National Watershed Development Programme, Ministry of Rural Development

2. Encourage and Facilitate Traditional Sustainable Livelihoods

Based on the all-India survey carried out under Action 1 above, as also based on prior studies and assessments, traditional livelihoods that are already sustainable to be encouraged and supported through various means, including social, economic, and political incentives.¹ These include livelihoods relating to wetlands, coastal/marine areas, forests, grasslands, deserts.

Justification: Diverse models of livelihoods were developed by communities through continuous interaction with nature and natural resources; many of these had worked out qualitative or quantitative measures of sustainability. These are unfortunately eroding rapidly. The search for sustainability in biological resource use needs to build upon such tried and tested practices of local communities, where still sustainable and relevant.

Suggested Responsibility: Ministry of Rural Development, Ministry of Tribal Affairs, in collaboration with Ministry of Environment and Forests, relevant research institutes and agencies like CAPART, National Innovations Foundation, etc., and with the central involvement of associations/groups/unions of women and men farmers, fisherfolk, pastoralists, artisans, and other forest-dwellers or wetland/marine ecosystem users.

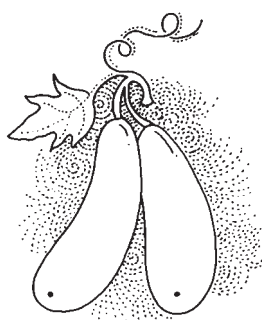
Time Frame: Ongoing

Steps:

- i. Make a roster of sustainable livelihoods and publicise it widely, to provide social recognition to relevant communities and inspiration/learning for others to adopt such livelihoods;
- ii. Integrate and encourage such livelihoods in all programmes of resource use and conservation, including watershed development, participatory irrigation management, JFM, protected areas, fishery development, etc.;
- iii. Provide a range of incentives for continuation of such livelihoods, including social awards and recognition, financial subsidies and support, etc.;
- iv. Facilitate the continuation of such livelihoods through appropriate institutional, legal and policy measures, including secure land and resource tenure, decentralised decision-making etc. (see also Section 7.1.5).

3. Facilitate Appropriate Adaptations in the Case of Traditional Livelihoods that have Become Unsustainable but Can be Brought Back to Sustainability

Based on the survey as specified in Action 1 above and on other existing studies, identify communities or users whose resource uses have become unsustainable, analyse the reasons for this unsustainability, and introduce measures to tackle it through structural changes (in tenurial rights, institutional arrangements, land/resource dis-



tribution, decision-making powers, etc.), as also technological and other modifications. Where the reasons for unsustainability are the sheer scale of demand for the resource, it would be necessary to take measures to curtail the demand through self-regulation by empowering local institutions or through appropriate consumer disincentives, or else find alternative products or alternative livelihoods (*see Action 4 below*).

Examples of some such livelihoods include:

- i. Excessive collection of many species of animals and plants and their parts used in medicine;
- ii. Over-harvesting of cane for various products in the north-eastern states and Andaman & Nicobar Islands;
- iii. Use of destructive methods and technologies in fishing especially under the influence of market demand;
- iv. Violent methods of honey extraction (involving destroying the beehive);
- v. Open grazing without restrictions;
- vi. Pesticide-dependent plantations.



Justification: Since a host of factors have led or forced many livelihood options to become unsustainable, the ideal course of action on these would be to facilitate changes such that sustainability is re-introduced.

Suggested Responsibility: Community and PRI institutions, with support from Ministry of Rural Development, in collaboration with Ministry of Commerce, CAPART and relevant NGOs.

Time Frame: 5 years for an initial sample.

Steps:

- i. Identify currently unsustainable livelihood practices, and the causes of their unsustainability;
- ii. Tackle, through appropriate policy, legal, and administrative measures, the root causes of unsustainability, including resource alienation, centralisation of decision-making powers and delegitimization of traditional institutions leading to conversion of CPRs into open access, demographic changes, loss of traditional knowledge, inappropriate policies and laws, etc. (*see also Section 7.1.5*);
- iii. Introduce other modifications, including appropriate technologies, that would help to regain the sustainability of these livelihoods; in doing this, seek lessons from initiatives across the country that have successfully introduced such modifications (*see Section 6.1.4* for some examples);
- iv. For the above, try on-ground changes in a sample of representative sites.

4. Explore and Introduce Alternative Livelihoods Where Regaining Sustainability for an Existing Livelihood is not Possible

Facilitate the introduction and assimilation of alternative livelihood options where existing livelihoods have become irretrievably unsustainable. These options should:

- i. Build on available skills and resources as far as possible, and include a period of training and capacity-building in situations where new skills are needed;
- ii. Avoid or minimise dislocation and cultural disruption;
- iii. Ensure that the alternatives are ecologically, institutionally and socially sustainable and equitable (which would in most cases mean that intensification of production may not be appropriate).

Examples of such livelihood practices include:

- i. Nomadic pastoralism where nomadic routes have been irretrievably lost
- ii. Non-pastoral nomadism where nomadic routes have been lost, access to resources has been curtailed, and/or the relevant traditional skills/produce/trade has become redundant in the modern context
- iii. Shifting cultivation where area available has drastically shrunk and/or dependent population has increased considerably, and there is no way of resuming *jhum*, even in modified forms (*see also Box 7.2.4.5*)
- iv. Livelihoods in/around PAs which are irretrievably unsustainable or where current livelihoods are inherently endangering threatened species and ecosystems (*Livelihoods, Lifestyles and Biodiversity Thematic BSAP*).

Justification: Various factors have rendered a number of livelihood practices unsustainable; in addition, several

new livelihood practices that are ecologically destructive have been adapted by communities. Changed circumstances may not allow for these practices to continue in a modified way (*Action 3* above), thereby necessitating the search for alternative livelihoods.

Suggested Responsibility: Ministry of Rural Development, Ministry of Agriculture, Ministry of Science and Technology, Ministry of Environment and Forests, Ministry of Tribal Welfare, in collaboration with institutions like CAPART, Indian Institute of Rural Industrialisation, local NGOs and relevant community institutions or their federations.

Time Frame: 5 years

Steps:

- i. Based on the survey in *Action 1*, identify the livelihoods across the country and their underlying socio-economic and technological factors, that need alternatives;
- ii. Identify alternative livelihood options for such areas and communities, especially those that can fully utilise existing skills and local resources; for this exercise, seek lessons from initiatives across the country that are already developing such alternatives (*see Section 6.1.4.2* for some examples)
- iii. Introduce these livelihood options with due sensitivity to existing skills, cultural factors and ecological sustainability, in consultation with the people concerned;
- iv. Build the capacity of communities to choose among livelihood options, keeping in mind factors such as sustainability, equity, etc.;
- v. Ensure that there are linked markets and other structures for communities to optimise their benefits from the new livelihood options. This is best done by marketing federations and small-scale community cooperatives, supported by NGOs and government agencies (*see Section 7.1.2.3*);
- vi. Ensure that alternate livelihoods do not clash with and displace traditional livelihoods other than the one which is being replaced.

5. Strengthen Biodiversity-Based Artisanal (Including Medicinal Plant-Based) Livelihoods

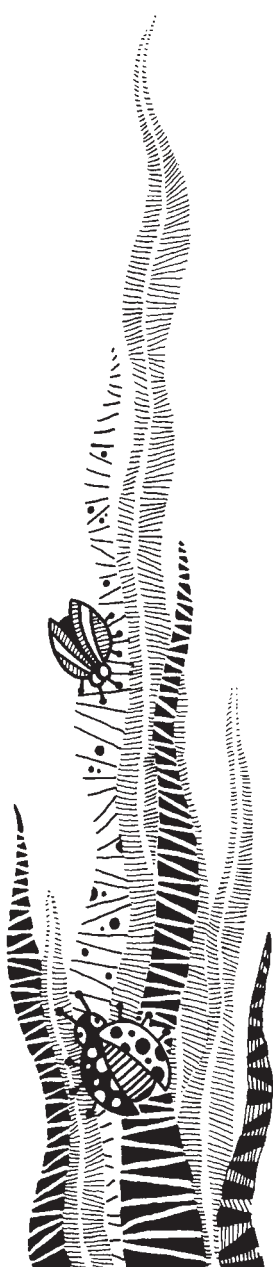
Encourage and support artisanal livelihoods that are based on biodiversity and biological resources ('Institutional and technological systems to enable rural artisans to sustain biomass based crafts'..National Conservation Strategy). These would include, among others:

- i. Products made from bamboo, cane, and other grasses,
- ii. Products from leaves, flowers and other plant parts (including natural dyes, *see Box 7.1.4.4*),
- iii. Medicinal plant-based products (*see Boxes 7.1.4.2 and 7.1.4.3*),
- iv. Raw and processed food items (including fermented foods),
- v. Cosmetics,
- vi. Products from aquatic resources, and
- vii. Mushrooms.

Justification: Several million households in India have historically been dependent on biological resources for their artisanal livelihoods, and have in the process developed considerable skills and knowledge related to biodiversity. Socially and economically underprivileged sections, especially women, are in particular heavily dependent on such livelihoods. Changes in customary rights regimes and other social and ecological changes have threatened this relationship, threatening both the artisans and the resources. Nomadic artisanal communities are especially seriously threatened (*Non-pastoral Nomads and Biodiversity Sub-thematic Review*).

Suggested Responsibility: Khadi Village Industries Commission and National Handicrafts Board, in collaboration with NGOs like Dastkar, and relevant institutions and community groups, including artisanal associations; support from Ministry of Science and Technology (including Department of Biotechnology), Ministry of Tribal Affairs, Ministry of Small Scale Industries, ICFRE, etc. (*see also Box 7.1.4.2* for other suggested responsibilities).

Time Frame: One year for Steps 1 and 2; ongoing for Step 3



Steps:

1. Initiate a countrywide study on the links between artisans and biodiversity, including traditional knowledge, the continuing dependence of artisans on biological resources, the status of these resources and rights of access to them, and methods by which the links (or alternative institutional arrangements and CPR rights) can be strengthened to enable secure livelihoods and a stake in conservation.
2. While doing this, provide for special focus on nomadic artisans whose livelihoods are based on biological resources, including healers, entertainers, animal catchers, etc.; their nomadic lifestyles and biodiversity links could be respectfully used for imparting the message of conservation while ensuring their current or modified/alternative livelihoods (*Non-pastoral Nomads and Biodiversity Sub-thematic Review*).
3. Based on the above study and other available information, provide infrastructural, legal, technical and financial support to artisans, to enable secure livelihoods based on biological resources (including through alternative means in the case of wildlife trade-related artisans, and through appropriate value addition), and to facilitate their participation in the conservation of these resources (for actions specific to medicinal plants, see Boxes 7.1.4.2 and 7.1.4.3, and for actions specific to natural dyes, see Box 7.1.4.4).

Ongoing Relevant GOI Schemes/Programmes:

- The Societal Programmes, Ministry of Science and Technology.
- The Biotechnology-Based Programmes for Society, Department of Biotechnology.
- TRIFED, Ministry of Tribal Affairs
- Operational Guidelines for Financial Assistance through National Medicinal Plants Board
- Central Scheme for Development and Cultivation of Medicinal Plants, Department of Indian Systems of Medicine and Homeopathy.
- Swarnajayanti Gram Swarajgar Yojana, Ministry of Rural Development
- Ministry of Social Justice and Empowerment, Income-generation programmes for women

Box 7.1.4.2 Conservation and Sustainable Utilization of Medicinal Plants, and Promotion of Biodiversity-Based Health Traditions

(See also *Health and Biodiversity Thematic BSAP, Livelihoods and Biodiversity Thematic BSAP, and Wild Plant Diversity Thematic BSAP*)

The 4600-odd ethnic communities of India have been the traditional custodians and users of around 8000 species of medicinal plants. These 8000 plants are referred to by different local communities by over 100,000 vernacular names. The strategies and action for the conservation and sustainable utilization of medicinal plant resources, needs to involve these traditional custodians, in collaboration with relevant government departments (forest, health, rural development, tribal welfare, etc.), NGOs, research institutes, schools, colleges and *panchayats*.

The key research activities and actions to support the conservation and sustainable utilization of medicinal plants are outlined below:

1a. Key Research and Development Activities

The following activities need to be undertaken, keeping traditional medicine practitioner communities such as *nattu vaidyas* at the centre of planning and decision-making, and building on their existing knowledge and skills:

1. A bio-cultural database of the medicinal plants of India. This should include reliable correlation of the several ethnic names of plants with their corresponding botanical identities. It should also include the botanical description and natural distribution of the plants.
2. Studies on rapid threat assessment of medicinal plants in different states of India.
3. Studies on the sustainable levels of harvest for species that are in trade.
4. Research for saving the species that are on the verge of extinction.

5. Preparation of 'Negative List of Plants' in trade, where collection from the wild needs to be regulated or banned, particularly in the case of critically endangered species.
6. Establishment of national as well as regional herbaria of medicinal plants.
7. Economic impact analysis of consumption of medicinal plants by the industry. Although several *ayurvedic* companies have herbal gardens of their own, they cannot substitute for wild medicinal plants. This is because the quality of medicinal plants parts collected from the wild is superior in comparison to those 'cultivated' *ex situ*. Secondly, the prospects of *ex situ* cultivation of medicinal plants by the industry may be limited because of non-availability or limited availability of land.
8. Standardization and quality control criteria followed for raw/crude drugs: Most of the medicinal plants used as raw materials by both the small and large industries as well as village-based industries are collected from the wild. There are medicinal plants that are high-value and rare, and therefore facing extinction, which results in the manufacturers using cheaper substitutes. Since the pharmacopoeias of the finished formulations are being finalised and the enforcement of standards in complex formulations is difficult, the quality of drugs available in the market varies widely. Coupled with this, companies often resort to short-cuts in preparation techniques and also at times do not follow application of appropriate processing technology and storage conditions.
9. For improving this situation, the following steps are needed:
 - Adoption and implementation of techniques/technology for medicinal plants screening/testing/clinical evaluation/safety evaluation as well as research and development safety, efficacy, quality control and pharmacopoeia development.
 - Establishment of drug-testing labs for ISMH products, with staff qualified to test the plant-based product. Provide quality control and standardization facilities through KVIC laboratories to, village industry manufacturers and to the labs to be set up by NGOs/institutions with KVIC support.
 - Training to laboratory staff, drug inspectors and quality control managers of manufacturing units for identification of raw material for the presence of the required/essential properties.
 - Ensuring implementation of Good Manufacturing Practices (GMP) for the ISMH drug industry. The introduction of GMP for village and small-scale manufacturers should be done only after provision of adequate common manufacturing and testing facilities in the public, cooperative and private sectors.
 - Involving KVIC in training village industry manufacturers in various aspects.
 - Policy, legal and institutional support should be extended to the sector for adopting standards, quality control, efficacy and effectiveness of the herbal drugs.

Suggested Responsibility: The above research activities should be farmed out by the Ministry of Environment and Forests and the Ministry of Health to reputed research institutes and NGOs, with instructions to engage in active and respectful collaboration with traditional medicine practitioners and their communities.

Time frame: 5 years

1b. Related Action Points Are:

1. Assessment of the rates of extraction of medicinal plants from various habitats, linked to the *ayurvedic* industry's requirements and for export and the impacts of this.
2. Effective regulation of extraction and transport of medicinal plants from the wild by the state Forest Departments, other relevant government agencies and communities. This could be supplemented by the preparation of a database of traders, contractors, wholesale dealers and final consumers of medicinal plants.
3. Creation of a forum to bring together the ISMH industry, State Forest Departments and other relevant departments, NGOs, and community representatives (both women and men) to deliberate issues like the rates of extraction, processing standards, management, pricing system, etc.

2a. Key Conservation Actions

1. A network of 300 *in situ* medicinal plant conservation areas or gene banks in forests (average size of 50 ha in high altitudes and 200 to 500 ha in tropical forests) and in some other ecosystems, to conserve 'effective populations' of prioritized species (endemic, red-listed and highly traded species) and representative population of the entire medicinal plants diversity of the country. A network of nurseries should be attached to these reserves, from which the public can obtain genuine planting materials. The Planning Commission Task Force on Conservation and Sustainable Use of Medicinal Plants, has recommended that these be established in existing protected areas and RFs (www.planningcommission.nic.in/aboutus/taskforce/task.htm). However, these should also be outside of these areas. This action needs to be implemented by State Forest and Health Departments in collaboration with local management committees, ensuring that communities and underprivileged sections including women in particular, have a central voice in decision-making.
2. In every State, the State Forest Department to establish a 'Medicinal Plants Seed Bank' in collaboration with community groups and NGOs, for supplying seed materials to user groups.
3. A network of district ethno-medicinal plants gardens to be established, with one or two gardens in each district, depending on the size of the district and its biogeographic variation. These gardens can be established by CBOs, NGOs, schools, colleges, women's groups and PRIs.
4. A network of thousands of home herbal gardens to be promoted in the rural and urban areas of the country. This programme should be promoted via Women Self-help Groups, residents' associations, kitchen garden associations, amongst others.
5. Low risk, organic, poly-culture cultivation of medicinal plants (trees, shrubs, grass, climbers, herbs etc.) of economically important species to be promoted through community organisations.
6. Dissemination strategies and advocacy and communication roles and materials in local languages need to be strengthened, and awareness and availability of plant stock and agro-techniques for cultivation of medicinal plants need to be improved.

Time frame: 3 years.

2b. For the above, the following specific actions needed are:

1. Develop agro-techniques and protocols for mass multiplication of selected medicinal plants by ICFRE institutes, and supply of this material to cultivators and foresters.
2. Collecting and disseminating information relating to inter-cropping, rotational cropping, use of biofertilizers and organic farming to farmers and cultivators through the Forest and/or Animal Husbandry/Agriculture/Rural Development Department.
3. Human resource development by organizing training programs on agro-practices, post-harvest technology and quality control techniques.
4. Training women and men in the utilization, cultivation and marketing of products based on medicinal plants using modern technologies.
5. Planning and implementation of appropriate dissemination strategies for medicinal plants cultivation, conservation and processing, advocacy and communication roles and materials in local languages.
6. Establishing a network of nurseries for supply of quality planting material for medicinal plants.
7. Establishing expertise in the field through ICFRE, CSIR and ICAR institutions, including technology processes, extension workers, gender specialists and effective communication tools.
8. Developing effective monitoring tools and indicators to assess the impact of technological interventions for medicinal plants.
9. Initiating networking through KVIC with village industries units, NGOs, national R&D labs and regulatory agencies to provide the necessary support to this sector.

Box 7.1.4.3 Health and Biodiversity: Perceptions of Nattu Vaidyas

During the preparation of the *Health and Biodiversity Thematic BSAP*, the following perceptions and recommendations of *nattu vaidyas* (traditional healers) were highlighted:

- Government and private bodies to honour outstanding *nattu vaidyas*;
- Cultivation of species that are hard-to-obtain, or declining in availability, to be facilitated through local communities;
- Small-scale pharmacies to be set up at village/district level, with local management;
- Certification and labelling procedure for natural and biodegradable products;
- Facilitate creation of bodies for organising, regulating, upgrading, and networking traditional healers;
- Educate communities, health workers, planners and educators, on traditional foods and herbs, and the links between nutrition, health, and biodiversity.

Source: *Health and Biodiversity BSAP*

Box 7.1.4.4 Reviving Natural Dyes

'Natural circumstances have made this country particularly suited to the practice of natural dyeing. Human agency in the recent past has not been so beneficial, with the stoppage of flowing waters, the destruction of plant life and, worst of all, the poisoning of soil and water by chemical poisons. Whole populations of artisanal practitioners in interlinked occupations related to dyeing have been uprooted and their carefully nurtured knowledge lost.

Natural dyeing has to be part of a gamut of environmentally sensible economic activities, that would integrate the lives and activities of agricultural producers, pastoralists, and others dependent on natural resources, in a web of mutually supportive rather than competitive professions.'

Actions

1. Trade linkages, which promote transparency and avoid the dichotomy between local and distant markets must be developed. The process must be mediated by the self-regulatory mechanisms of local self-government institutions.
2. Sustainable linkages must evolve between the dye-materials, their cultivation or collection, and their use. The most important ingredients for the re-establishment of natural dyeing is the ingenuity and confidence of the various practitioner communities, developed through linkages with sensitive and discerning markets, and the revival and protection of the biological resource base itself. Linked to its local users, natural dyeing can also be a powerful tool to regenerate local flora.
3. In cases of conflicts between different local occupations (including apparent conflicts in rights between forest or field, pastoral or agrarian, and between both these and artisanal or tribal rights), measures are needed to resolve these on the basis of community and social good, rather than individual benefit. The answers must be local and varied, and evolved in consultation with all the people involved.
4. Research institutions should:
 - Conduct experiments in cultivation and extraction practices which will improve the yield of natural dyes.
 - Conduct research to increase profit margins for commercial cultivation and to develop an extraction process suited to the small artisan that would be less energy-intensive.
 - Link laboratory research with field practice at an early stage, to avoid appropriation of community knowledge by commercial interests. It is also critical to sort out issues of intellectual property rights, in particular to ensure that the traditional and indigenous knowledge that dyers/weavers have, is respected and protected, and its commercialisation by others is done only with the consent of these people and with appropriate sharing of benefits.
 - Analyse past practice and existing knowledge as a base for the development of a natural dyeing practice appropriate to contemporary circumstances.
5. In order to re-introduce indigo dyeing on a significant scale, a series of short-, medium- and long-term measures will have to be devised, to reconnect the producers of indigo with vat dyers and indigo printers, and the dyers with weavers,

to rebuild the country's skill base and capabilities in producing indigo-dyed and patterned textiles, for domestic markets as well as for export. (**Justification:** Indigo dyeing will be the mainstay of natural dyeing if the natural dyeing industry is to be revived, because it can be produced with lesser energy investment than any other colour, particularly for cotton.)

6. The Government needs to protect indigo cultivators by charging duties and excise on the German 'indigo', forcing importers to label it as artificial, and by once again supporting natural indigo through appropriate marketing and promotion.

Source: Natural Dyes and Biodiversity Sub-thematic Review.

6. Introduce or Strengthen Bioresource-Based Enterprise Amongst Local Communities

Introduce, through culturally and ecologically appropriate methods, a range of enterprises amongst the women and men of local communities that can help them to gain sustained benefits from biological resources. This could include direct linkages between community-based enterprise groups and manufacturing or marketing units (e.g. see Box 7.1.4.5).

Justification: Biodiversity-based enterprises managed by local communities may provide a strong incentive for communities towards conservation. In any case such enterprises are needed for ensuring sustainable livelihoods. Local communities have always relied on the use of local biological resources, both for subsistence and for revenue. Products that are sold commercially include bamboo, resin, lac, *tendu* (*Diospyros melanoxylon*) leaves for *beedies* (country-made cigarettes), honey, tasar silk cocoons, fruits, mushrooms, lichens, and other non-timber forest produce (NTFP). According to one estimate, NTFP income accounts for 55% of the total employment in the forestry sector (Saigal *et. al.*, 1996).

Revenue generation through conservation projects does happen occasionally, but generally the focus of projects is not to raise incomes of local communities. Biodiversity-based enterprises are generally 'spin-offs' from community conservation programmes. The Joint Forest Management programme in many parts of the country, for instance, is now looking at value addition for many products from forests (see also other examples in Section 6.1.4.2, including that of the Biodiversity Conservation Network (www.bcnet.org), and others like Community Enterprise Forum of India (www.brinkster.com/cefi.htm)).

Suggested Responsibility: Community-based groups and associations, and PRI institutions, with relevant NGOs and government agencies, including the National Bioresources Board, National Medicinal Plants Board, National Handicrafts Board and KVIC; support from financial institutions that provide micro-credit and financing to the poor.

Time Frame: 5 years for initial pilot sites; ongoing thereafter.

Steps:

- i. Create awareness amongst local communities of the possibilities of biodiversity-friendly enterprise, including of products not traditionally used;
- ii. Facilitate local people in building capacity to handle the enterprise in question. This will involve training in various skills. Important among these are basic things like bookkeeping and maintaining accounts;
- iii. Facilitate the strengthening or creation of community-based institutions to handle the enterprises and related activities, ensuring special attention to underprivileged sections including women;
- iv. Set up a system of monitoring that ensures sustainable use of the resource in question. This will involve training of the people in appropriate methods. It must also be ensured that traditional methods of monitoring are recognized and integrated into the monitoring system;
- v. Explore markets for the products, stressing on the local and regional before the national and international; in this process include innovative advertising and publicity, such as stressing the eco-friendly and pro-poor nature of the products;
- vi. In all of the above, keep in mind the need to address a set of critical questions relating to sustainability, gender, and equity (see Box 7.1.4.6);



- vii. Initiate the above steps in a sample set of sites, both where ongoing initiatives can be built upon and where new ones need to be started; extend to other areas after lessons from these sites are learnt.

Ongoing Relevant GOI Schemes/Programmes:

- The Societal Programmes, Ministry of Science and Technology.
- The Biotechnology-Based Programmes for Society, Department of Biotechnology.
- TRIFED, Ministry of Tribal Affairs
- The National Medicinal Plants Board Scheme under National Medicinal Plants Board
- The Central Scheme for Development and Cultivation of Medicinal Plants, Department of Indian Systems of Medicine and Homeopathy

Box 7.1.4.5 Encouraging Community Enterprise in Medicinal Plants: An Initiative in Kerala

The Arya Vaidya Sala, Kottakkal, Kerala, has proposed that medicinal plants be cultivated in selected districts of Kerala. It has been estimated that 80% of the raw material collected for *ayurvedic* drug manufacture come from natural forests. The proposed area of operation of the project will be in four districts: Malappuram, Kozhikode, Palakkad and Thrissur. 40 farmers interested in the cultivation of medicinal plants will be identified in each district (160 in all), with the help of district panchayat, voluntary organisations and NABARD. Training in nursery practices, cultural operations, harvesting procedures, semi-processing, value-addition methods, storage and marketing of medicinal plants will be organised for the benefit of these farmers. It is proposed that 400,000 seedlings of medicinal plants will be raised in the Vaidya Sala's gardens at Kottakkal, Kottapuram, Kanhirapuzha and Kanjicode (100,000 for use in each district). These nursery-raised seedlings will be distributed to the trained farmers for planting in their fields. Appropriate marketing strategies will also be worked out in consultation with the farmers. The project is being proposed for a period of three years.

Source: Kerala State BSAP

Box 7.1.4.6 Critical Issues in Biodiversity-Based Enterprises

The promotion of biodiversity-based enterprise needs to deal with the following ecological and sociological issues:

- How does one conserve critical ecological attributes, and also optimise output?
- How can the *bonafide* dependence of the local community on the resources be met, while attempting to promote conservation through community enterprise?
- How can one assess the continuing relevance of indigenous knowledge?
- Can harvesting and monitoring techniques that are ecologically more appropriate be spread amongst local communities, where traditional techniques may have been lost or may not be appropriate any longer?
- How can one assure a market for the sale of these products?
- Do communities see a link between the enterprise and conservation of biodiversity, or is the absence of enterprise more conducive to conservation, as may have traditionally been the case?
- How does one ensure that official agencies and NGOs working with communities understand the issues of sustainability and equity?

7. Enhance Use of Undervalued Traditionally Used Bioresources, While Ensuring Their Sustainability

Identify biological resources traditionally used by communities but currently under-valued by the larger society, and enhance their use for generating equitable community benefits. These include, among others:

- i. Wild fruits and other plant parts, with considerable value as processed food, cosmetics, biopesticides, or other such products;
- ii. Exotic and other weedy species, which have innovative uses such as for rope-making, natural dyes, biofertilisers, etc, with a view to eventually eradicate them and replace by indigenous species that are also of livelihood use;
- iii. Agricultural produce (see Sections 7.2.4.4 and 7.2.4.5)

Such enhanced use must ensure sustainability of the resource and of the ecosystem and other species dependent on it, the continued availability of the resource for traditional livelihood and survival uses, and the flow of maximum benefits in an equitable manner back to the community concerned.

Justification: Several biological resources that are traditionally used for domestic and survival purposes, have a wider social and economic value. This is especially due to the growing consumer awareness regarding ecological and health issues. But communities are either unaware of these larger values, or do not have the capacity to make use of them. Several initiatives by communities, NGOs and government agencies have shown the potential of these undervalued resources in creating a stake for conservation, while ensuring better returns for communities (see Sections 6.1.4.2, 6.2.4.2, and 6.2.10.2 for some examples).

Suggested Responsibility: National Bioresources Board, Department of Biotechnology, Ministry of Tribal Affairs, Department of ISMH, MoEF, agricultural produce marketing agencies, Large Scale Adivasi Multipurpose Societies (LAMPS), and Ministry of Commerce, in collaboration with NGOs, institutions (like ICFRE) and community groups that have demonstrated successful initiatives in this direction, market survey groups, and banks, and through appropriate community institutions.

Time Frame: Initial identification in two years, pilot sites in five years, other measures ongoing thereafter.

Steps:

- i. Identify, through community institutions and associations of bioresource users, the range of resources that are currently undervalued;
- ii. Conduct local, national and international market surveys for potential demand for such resources;
- iii. Facilitate the development, introduction and transfer of methods and technologies that would help enhance the value of the identified resources, building on the base of skills and knowledge already available with the community;
- iv. Facilitate marketing links to enable communities to generate returns from the produce;
- v. Create or empower existing community-level institutions to handle the entire process, including the equitable distribution of benefits and the monitoring of the ecological and social impacts (see Section 7.1.1.1 on Participatory M&E).
- vi. Take the above steps in some, representative sites to start with, and extend elsewhere after learning lessons from these.



Ongoing Relevant GOI Schemes/Programmes:

- The Societal Programmes, Ministry of Science and Technology.
- The Biotechnology-Based Programmes for Society, Department of Biotechnology.
- TRIFED, Ministry of Tribal Affairs
- The Operational Guidelines for Financial Assistance through National Medicinal Plants Board Scheme under National Medicinal plants Board
- The Central Scheme for Development and Cultivation of Medicinal Plants, Department of Indian Systems of Medicine and Homeopathy

7.1.4.5 Strategy: Ensure that Tourism and Pilgrimage are Ecologically and Socially Sensitive, in Both Existing and New Areas

Actions

1. Draft Guidelines and Spread Awareness Regarding the Promotion of Sensitive Tourism and Pilgrimage

Prepare a set of guidelines and promote their use, regarding ecologically and socially sensitive tourism and pilgrimage.

Justification: The term 'ecotourism' is most often interpreted in a manner that best suits the user. The tourism industry at present gets away with a lot by claiming that what they are doing is 'ecotourism', while in reality it is no different from what is usually done. It is very important that awareness about the concept be spread among all the relevant stakeholders. It needs to be understood that this is actually a concept which is very different from the usual tourism endeavours. A more direct term like 'sensitive tourism' could be adopted, to denote activities that enhance local ecological, cultural, social, and economic values and benefits, without being ecologically and socially destructive, while being under some form of control of local communities.²

Similarly, the traditional practice of pilgrimage has become considerably distorted in recent times. Serious ecological and cultural damage is being caused because of this, and there is an urgent need to take corrective steps.

Suggested Responsibility: The Ministry of Tourism (in particular its committee on ecotourism), Ministry of Culture, and the Ministry of Environment and Forests along with institutions that have been working on sensitive tourism and pilgrimage issues (e.g. Wildlife Institute of India, EQUATIONS, The Mountain Institute). Institutions and community groups working on environmental education and livelihoods (e.g. CEE and ANET), religious trusts and institutions, and other related groups should also be involved.

Time Frame: One year

Steps:

- i. Identify a set of criteria used to define sensitive tourism, as relevant to different ecological conditions (terrestrial/aquatic, freshwater/marine, mountains/plains, etc.), and to different cultural settings; for this, build on documented best practice examples from within and outside India;
- ii. Arrive at a workable definition of such tourism, using the principles stated above;
- iii. Prepare a set of guidelines that adhere to the principles of such tourism;
- iv. Establish a Code of Conduct to help carry these guidelines forward in field situations;
- v. Ensure that all the above are circulated widely among different stakeholders.

2. Build Capacity of Stakeholders to Work Within the Philosophy of Sensitive Tourism

Develop the capacity of various stakeholders, especially local communities, to enable sensitive tourism to be achieved.

Justification: Once the concept of sensitive tourism is understood, it is equally important to ensure that the capacity of all stakeholders involved in this is built to meet the specified criteria. Porters, lodge/hotel owners, tour operators, private estate (e.g. plantation) owners, and others from within or outside the local communities and from the tourism industry will all need to be trained to ensure that tourism is ecologically and socially responsible.

Suggested Responsibility: Organisations (e.g. The Mountain Institute/The Wildlife Institute of India/Project Tiger) that have been involved in ecotourism-related activities.

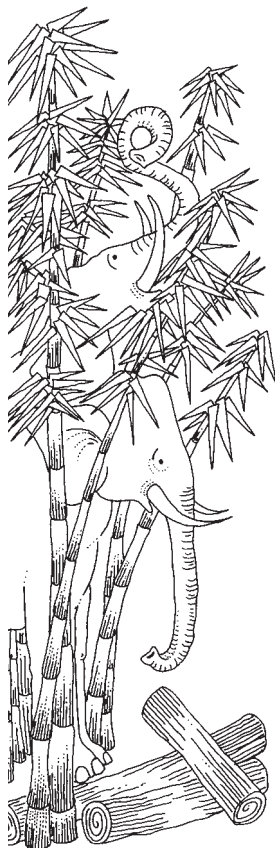
Time Frame: Two years to build the capacities of the institutions; thereafter an on-going activity built into the curriculum of related institutions.

Steps:

- i. Design appropriate modules for training different target groups, learning from relatively successful ecotourism activities such as the one at Periyar Tiger Reserve in Kerala.
- ii. Establish training curricula for appropriate institutions
- iii. Organise programmes to train the trainers, where other tourism-related organisations and NGOs personnel can be trained. These individuals can then help in capacity-building of other stakeholders.

3. Work Towards a Tourism Policy that is Both Ecologically and Socially Sensitive

Centrally integrate ecological and social sensitivity through all the elements of the Tourism Policy 2002.



Justification: In the long run what is really required is a Tourism Policy that emphasises ecologically and socially sensitive tourism. Small efforts at ecotourism are required to be developed and can then be used as role models. It is important that norms followed by ecotourism are followed by every tourism initiative in the country. This is required if the natural heritage of this country is to be conserved and local communities are to gain from this industry. The current Tourism Policy goes a certain distance in this regard, but needs to be much more sensitive.

Suggested Responsibility: The Ministry of Tourism and the Ministry of Environment and Forests, with relevant NGOs like EQUATIONS, and community-based organizations, including those where successful community-based tourism is going on.

Time Frame: Three years

Steps:

- i. Hold a wide round of discussions and workshops with the Tourism Industry, NGOs in this field, other relevant institutions, and representatives of communities that have taken initiatives in this respect, to review the Tourism Policy 2002.
- ii. Redraft the policy with the help of an expert group of individuals chosen from the above consultations;
- iii. Circulate the draft new policy widely, in different languages, and finalise it on the basis of comments.

4. Ensure that Local Communities are the Primary Beneficiaries and Managers of Tourism in Their Traditional Sites

Redirect and orient all tourism activities to benefit and come under the management of local communities, while ensuring ecological sensitivity, through the following measures:

- Planning local tourism activities by/with these communities, to ensure that the activities are socially sensitive and do not adversely affect them;
- Ensuring that tourism activities are carried out in an area only after receiving the consent of the village communities that could be affected, with particular focus on underprivileged sections that could be adversely affected;
- Helping to build the capacity of communities to handle decisions, facilities and activities relating to tourism;
- Providing incentives and training to start their own visitor's facilities, as initiated by FRLHT in south India in collaboration with state Forest Departments at the Medicinal Plants Conservation Areas (MPCA), and with NGOs in the Medicinal Plants Conservation Parks (MPCP) elsewhere;
- Employing local people as guides and for other tourist services, focusing particularly on unemployed youth and underprivileged sections;
- Promoting local food, handicrafts and souvenirs as being eco-friendly;
- Mandating eco-technology in resource/energy use and waste management;
- Providing opportunities for local people to visit conservation areas as much as possible (also recommended in the 9th Plan document: 'It is essential that the Central Government provides financial support for the rural populations visiting various wildlife reserves so that they can also realise the long term benefits of conservation' (Report of the Working Group on Wildlife for the IX Plan (1997-2002), MoEF, May 1996, pg. 36);
- Planning pilgrimage activities in coordination with local religious and cultural bodies, to ensure ecological sustainability and local distribution of benefits from large-scale pilgrim visits to PAs and other conservation sites.

Suggested Responsibility: Ministry of Tourism with MoEF, State Forest or Wildlife Departments, state/national tourism bodies, NGOs such as EQUATIONS, ECOSS (Ecotourism and Conservation Society of Sikkim), religious institutions, and village-level institutions.

Time Frame: One year for plan, implementation ongoing thereafter.

Steps:

- i. Ministry of Tourism and MoEF to set up a joint working group with adequate NGO and community representation, to prepare a plan for community-based ecotourism;



- ii. Such tourism to be tried out in a sample of representative sites, including by building the capacity of local people;
- iii. Based on the lessons learnt, such tourism to be extended to other areas if considered feasible.

5. Ensure that Tourism and Pilgrimage Activities Achieve the Above Objectives

Take appropriate programmatic, punitive and incentive measures, to ensure that the tourism industry and organised pilgrimage adhere to the guidelines and principles of sensitive tourism. This could include rotation and diversification of tourism sites, spiritual/religious injunctions regarding pilgrimage spots, economic and social incentives for concrete measures that reduce tourism-related damage, punitive measures for continued destructive activities, building the capacity of communities and tourism companies/operators, and sustained interpretation/educational activities aimed at tourists and pilgrims.

7.1.5 Wild Biodiversity: Strategies and Actions for Equitable Access, Use and Sharing of Benefits

(**Note:** This section should be read in conjunction with the *Laws and Policies BSAP*, the *Livelihoods and Biodiversity BSAP*, and the *Access, Benefit-sharing and Intellectual Property Rights BSAP*, prepared under the NBSAP. Sub-thematic Reviews prepared under NBSAP, relevant to specific points in this Section, are referred to with the relevant action point. See also *Section 7.1.8*, especially *Strategies 7.1.8.5 and 7.1.8.6*, and *Boxes 7.1.8.7 to 7.1.8.9*, for policy/legal actions relating to the recommendations here. Strategies and actions laid out in *Section 7.1.2* should be kept centrally in focus while implementing the strategies/actions in this section, to ensure that conservation objectives are not undermined).

Overall Strategies:

Keeping in mind the twin objectives laid out in *Chapter 2*, constitutional guarantees and provisions regarding equity, India's obligations under the Convention on Biological Diversity (in particular Articles 8j and 10c), as also obligations under various other international conventions, the following strategies are recommended:

1. **Establish clear community tenurial rights and security over the land, water, and biological resources** that the communities have traditionally been associated with; special focus here needs to be on Common Property/Pool Resources (CPRs);
2. **Ensure equity in dealing with 'encroachments'**, distinguishing between vested interests and poor people, as also between actual encroachments and traditional practices that are mistakenly seen as encroachments;
3. **Ensure equity in ecosystem management initiatives** such as joint/community forestry management (JFM) and new arrangements like Forest Development Agencies (FDAs);
4. **Facilitate greater equity within and amongst communities**, including in gender, economic, and social relations;
5. **Protect traditional knowledge and traditionally managed resources**, and ensure equitable benefit-sharing in the wider use of such knowledge and resources.

7.1.5.1 Strategy: Secure Community Tenure Over Natural Resources

Overall Aim: Establish clear and secure tenurial rights and responsibilities of local communities over land, water, and biological resources, while ensuring that conservation and sustainability aspects of biodiversity are not adversely affected. This would be in line with the 73rd and 74th constitutional amendments, requiring decentralization of governance to Panchayati Raj Institutions (PRIs) and the specific provisions for their extension to Scheduled Areas; the national forest and water policies; and the Biodiversity Macro-Plan which states that it is necessary to 'review and if need be revise regulations that govern the ownership, access and management of natural resources, in line with the provisions of the Biodiversity Convention.'

Overall Justification: As discussed in *Section 5.2*, state appropriation of control over common pool land, water and forest resources, has disempowered local communities and delegitimised their diverse customary resource



management institutions. Complex community mechanisms for ensuring sustainability, resolving conflicts, etc. have as a consequence broken down. But with continued dependence on such resources, and increasing use of the same resources to feed elite consumption needs, many common pool/property areas have been converted into open-access systems, with severe negative consequences on biodiversity and biodiversity-related livelihoods. Initiatives like Joint Forest Management, have over the last 10 years shown the potential of improving community stake in conservation along with enhanced livelihood security; lessons from the strengths and weaknesses of such approaches need to be used in establishing well-defined tenurial rights and responsibilities. Reviving and securing community-based resource rights and management authority, together with conservation responsibility, has therefore become critical, even more so in the context of the intensifying pressures due to globalisation and technological change on the country's biodiverse natural resource base.

Actions

1. Establish Secure Common Property Rights of Traditional Marine Communities

(Read along with Strategy 7.2.5.2, Action 3).

Establish clear and secure tenurial rights of fisherfolk and other coastal communities, and responsibilities for conservation and sustainable use, relating to common marine/coastal areas and resources. Additionally, ensure that fishing communities that are dependent on the sea have a 'first right' to the lands that are closest to the sea, particularly lands that would not violate Coastal Regulation Zone (CRZ) stipulations. This may in some cases require acquisition from private landowners in areas such as those adjacent to the CRZ 'no-development zones', ensuring that this does not adversely affect another underprivileged community. Responsibilities could include accepting and ensuring restrictions on the number and scale of fishing assets, including a ceiling on the number of boats owned by an individual or family, to avoid over-fishing.

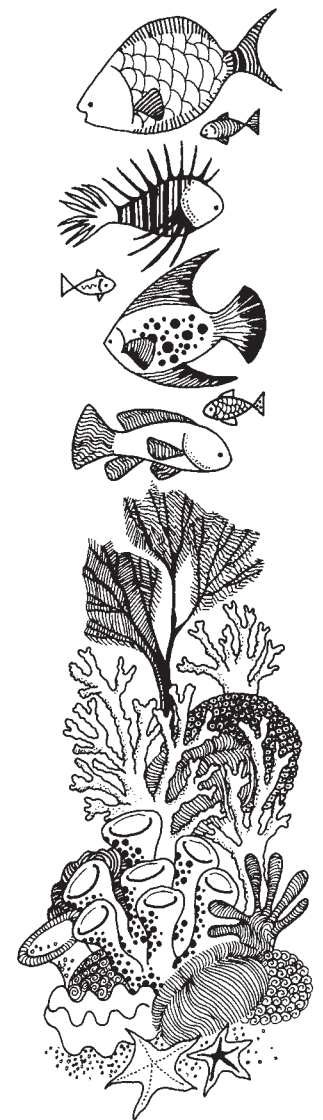
Justification: Local and indigenous coastal communities in India have interacted closely with the coastal ecosystem for generations, and have in many cases evolved community-based management systems based on equitable and ethical values, which have played a vital role in conserving and managing coastal and marine biodiversity (see Chapters 3 & 4 and Section 5.2). Their knowledge of such diversity and of the various aspects of marine/coastal ecology is also immense. Recent changes in resource use patterns and lifestyles, however, require a renewed commitment to conservation and sustainability.

Customary common property rights enabled coastal communities to conserve biodiversity through the ages. Non-recognition of these rights in the formulation of new government policies, along with the promotion of commercial exploitation of marine resources, has eroded ethical values and sustainable fishing practices by weakening community control and traditions. For example, the traditional village-level operation of *Rampani* net – a system that allows harvest of fish only to the extent needed at a time – has completely broken down on the west coast. Restoring secure common property rights and responsibilities to traditional coastal communities could enable them to conserve biodiversity and decide on its rational utilization. In particular, the areas designated under the CRZ notification in each state need to be considered as CPRs under the management of coastal communities.

Additionally, marine fisherfolk have conventionally often been underprivileged in not having clear title to lands near the sea. Indeed, there are some instances where the 'fringes' on which they live are not even in the Cadastral surveys! Also, they are sometimes dispossessed, or have certain of their activities curtailed, by the CRZ notification. Alternative land arrangements for them are therefore necessary in such cases.

Suggested Responsibility: MoA, MoEF, Ministry of Rural Development (MoRD), Department of Ocean Development, National and State Coastal Zone Management Authorities (CZMA), with fisherfolk federations and support organizations such as National Fishworkers Forum (NFF) and International Collective in Support of Fishworkers (ICSF), academic and policy analysis institutes like the Centre for Development Studies, Thiruvananthapuram, and community institutions including coastal *panchayats* at respective sites.

Time frame: 10 years





Steps:

- i. MoA (Fisheries Department), MoEF, MoRD (PRI Department) and Ministry of Social Justice and Empowerment to set up a joint task force including the federations/organisations mentioned above and other relevant organisations, to develop a comprehensive methodology for this task. As fisherfolk have strong federations, these should be authorised to develop the proposed CPR rights and responsibilities framework, conflict resolution mechanisms, supportive links with PRIs and market information systems, through open and transparent processes supported by government and non-government agencies.
- ii. Map coastal areas where customary common property management systems for marine fisheries existed/still survive and build upon them to develop locally appropriate *de jure* CPR rights for community ownership, control and management of coastal resources. For small-scale fisherfolk communities, this would imply replacing their traditional 'rights of possession' of marine resources with secure and clear 'rights of property'.
- iii. Develop a facilitative framework for promoting self-governing, democratic and gender-neutral community institutions for aquatic resource management, ensuring that common property rights include appropriate and equal individual rights of women and men;
- iv. Bring in greater social control over fishery export policies, by revising/developing them with the participation of fishworkers' federations and associations, to deal with undue pressures on community property rights regimes;
- v. Initiate steps to ensure that markets are modulated to become friendly to fisherfolk communities rather than vice versa, by building the capacity of these communities to process aquatic resources and do their own marketing, and nurture self-governing cooperatives or other institutional structures that empower them to negotiate with outside markets;
- vi. Within *Panchayats* in coastal areas, develop institutional mechanisms ensuring control over marine resource uses and management by traditional fisherfolk sections of the communities;
- vii. Empower coastal communities, through legal means, to restrict transfer of ownership of coastal lands to the communities themselves, and to redistribute available lands adjacent to the CRZ 'no-development' zone to traditional fisherfolk who are affected by 'development' projects or by CRZ restrictions;
- viii. Build into the measures and provisions relating to coastal community rights a clear list of responsibilities for the conservation and sustainable use of marine and coastal resources, including the protection of threatened species and ecosystems through appropriate zonation and measures such as jointly managed protected areas with government agencies and NGOs, as also restrictions on the number and scale of boats/fishing technologies used.

Ongoing Relevant GOI Schemes/Programmes:

- Conservation of Natural Resources Programme of the MoEF.
- Assessment of Marine Living Resources sub-programme under Marine Living Resources programme, Department of Ocean Development.
- (i) Capacity Building component under the Integrated Coastal and Marine Area Management (ICMAM) of the Department of Ocean Development
- Infrastructure, Training, R&D and Survey, Coastal Habitats, under Department of Ocean Development
- Island Development sub-programme under Coastal Community Programme of the Department of Ocean Development
- Digital Inventorisation under Resource Based Projects, NBDB
- Marine and Coastal Bioresources under Region-Specific Projects, NBDB
- Human Resource Development under (i) Coastal Bioresource Development (ii) Management, Training, Capacity-Building and Awareness Generation Projects of NBDB.

2. Establish Secure Common Property Rights for Freshwater Wetland Users Including Fisherfolk

Devolve management authority over common pool inland water resources to local communities (hamlets or multi-hamlet *gram sabhas* with customary rights over water resources), while ensuring that conservation and sustainability aspects of biodiversity are not adversely affected. Build upon surviving traditions and indigenous knowledge by granting secure CPR water rights to *gram sabhas* under state Panchayat Acts, including PESA.

Justification: As discussed in Section 5.2.2, management of common pool water resources by government departments, earlier managed by diverse community institutions based on customary CPR rights, has been weak from ecological, economic and equity perspectives. The more recent move towards participatory irrigation management has been positive and with significant potential. However, even Water Users' Associations have been fraught with increasing socio-economic and gender inequities and the continued control by government departments. Although in many states, the management of water tanks/ponds of less than 40 ha. is vested with *panchayats*, the policies for their management continue to be imposed from above. Community harvest of fish and other resources from ponds and tanks has been replaced by auctioning of fishing rights to the highest bidders or granting them to fishermen's cooperative societies. Lack of democratic governance of these cooperative societies has enabled powerful village elites or fish contractors to appropriate their control at the cost of the rights of traditional fisherfolk communities. The focus on maximizing commercial returns from fish farming has resulted in the introduction of exotic species, negatively impacting local aquatic diversity. Subsistence uses of water are often ignored, with inequitable impacts on poor women and other marginalised groups. All this points to the need to introduce secure rights and responsibilities over common pool water resources in the hands of democratic and equitable community institutions, and to integrate biodiversity concerns into their use.

Suggested Responsibility: Ministry of Water Resources, MoRD's PRI Department, MoA's Fisheries Department, Ministry of Social Justice and Empowerment, Women and Child Development Department, Department of Ocean Development, Ministry of Health, Ministry of Tribal Affairs (for Schedule V & VI and other non-scheduled tribal areas), National Bioresources Development Board, in association with or through state fisheries departments, individuals and institutions with expertise in traditional water harvesting systems, knowledgeable community leaders and grassroots organisations working on sustainable water management.

Time Frame: 5 years

Steps:

Set up a gender balanced, multi-sectoral empowered committee with representatives from all the above to chalk out a detailed plan of action including the following:

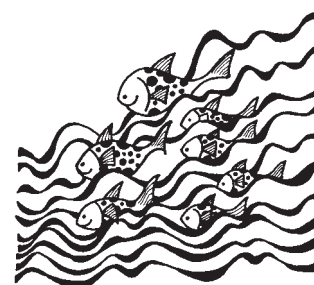
- i. Prepare comprehensive maps of inland water bodies and customary CPR rights over them, and document community water use and conservation systems where these still survive; use as a base the wetlands mapping done by Space Applications Centre, SACON and other institutions;
- ii. Clarify and restore the customary rights of traditional fisher communities, through a process of transparent public hearings and perusal of land records;
- iii. Ensure women's independent rights to water through appropriate legal means, by amending the relevant laws so as to delink water rights from land ownership, and explicitly incorporating this in the water policy ;
- iv. Develop guidelines for restoring indigenous aquatic biodiversity and maintaining habitats for birds and other small wildlife around the community-managed water bodies;
- v. In North-eastern states, where traditional governance institutions have statutory protection and resource management authority, route development funds meant for wetland and water uses through these institutions instead of through parallel bodies.

3. Establish Secure Common Property Rights for Traditional Users of Terrestrial Ecosystems and Their Resources

(see also Section 5.2.5)

Undertake a comprehensive, ecosystem-based survey of customary and present livelihood uses of all non-private, common pool lands, and record the customary common property rights of different user groups over them. These should include forest, revenue and village/*panchayat* common lands to provide an informed basis for:

- i. Recognizing their resource uses for appropriate and equitable land use planning;
- ii. Validating and protecting customary common property rights of different user groups, while tackling the threats posed by 'outsiders' claiming similar rights;
- iii. Making amendments in existing Panchayat, Revenue and Forest laws to provide legal protection to common property rights over common pool resources, so as to maintain their role in supporting diverse ecosystem-based livelihood systems.



There could be a multi-layered basis for facilitating negotiated redistribution of common lands amongst communities to reduce inequities and conflicts. Some of the considerations for this could be:

- i. Size of village, human population, livestock population, nature and intensity of agriculture, and extent of dependence on the commons.
- ii. The location of the commons (altitude, aspect, upland-lowland etc.), and its production capability in terms of what people need and use it for.
- iii. How much of the commons exists, and how it is located in relation to the villages close to it; how it must be shared between other proximate villages of nomadic communities who may have overlapping customary use; whether it can be distributed between them, or whether it is more practical to retain overlapping but joint and cooperative user rights.

Justification: Existing legislation does not provide adequate protection to common property rights. As described in Section 5.2.2, from the beginning of the colonial period, common pool land resources have increasingly been either privatized or taken over by the state as state-owned 'forest' or revenue 'wastelands'. Neither of these two major designations of public lands acknowledge their critical and time-tested role in supporting biodiversity as also a diversity of livelihood systems attuned to local ecosystems and indigenous knowledge about biodiversity. Diversion of common lands for other uses has caused loss of biodiversity, as also great hardship to pastoralists, marginal landowners or landless people, who depend heavily on such lands. In this context, it is crucial that some kind of common pool resource rights and responsibilities be re-established, albeit in forms that may be different from what existed in the past, so as to suit changed circumstances.

Suggested Responsibility: MoRD, MoEF, national and state Land Use Boards, Ministry of Tribal Affairs, Ministry of Social Justice and Empowerment, relevant state departments including Rural Development, Planning, Revenue, Forest, and Animal Husbandry, associations of pastoral and non-pastoral nomadic communities, small and marginal farmers' associations, fisherfolk associations, academic and policy analysis institutes working on CPRs, rural women's associations, Forest Survey of India, Indian Grassland Research Institute, CAZRI, and other such organisations.

Time Frame: 5 years

Steps:

- i. State Revenue and Forest Departments to facilitate participatory mapping of the *de facto* uses of common lands by the women and men of different socio-economic groups within local communities, with the help of relevant technologies and the involvement of community representatives, social activists and local NGOs;
- ii. Overlay the map of *de facto* uses on maps showing the legal classification of the lands;
- iii. *De facto* common lands classified as revenue 'wastelands' could be considered for reclassification as common lands, over which the user groups with both customary and legal rights may be granted common property rights;
- iv. A sizable part of the *de facto* common lands declared to be state-owned forests through blanket notifications, but for which no demarcation has yet been done, could be vested with community institutions of their customary users, like *gram sabha/panchayats/van samitis* for management, with a caveat that the current land use, if already oriented towards conservation and local livelihood security, shall not be changed. The FD could facilitate communities in sustainable management of these lands;
- v. Where the user right-holding group is a sub-group within a larger revenue village or *gram panchayat*, work out the most appropriate division of rights and responsibilities between the two; where the user groups cover multiple villages/*panchayats*, facilitate the setting up or strengthening of appropriate multi-village institutional arrangements for CPR management through inter-village negotiations;
- vi. Prohibit privatization of CPRs or their conversion to non-livelihood and biodiversity-insensitive uses, as is happening, for instance, with the move to attract private investments in so-called 'wastelands'.
- vii. Develop a programme for restoring the lands of *adivasis* forcibly displaced from their lands (e.g. for undertaking cashew plantations in Orissa), or for otherwise compensating/rehabilitating them.



Ongoing Relevant GOI Schemes/Programmes:

- All-India Soil and Land Use Survey Schemes (AISLUS) sub-programme under Natural Resource Management Programme, Ministry of Agriculture
- MoEF's programmes, including (i) Action plan under the UN Convention to Combat Desertification (UNCCD) Programme (ii) Conservation of Natural Resources Programme (iii), National Afforestation and Eco-development Board under the Programme of Regeneration and Development.
- (i) Tree Growers Co-operatives Projects under International Cooperation Programme (ii) Integrated Wastelands Development Programme (iv) Drought Prone Areas Programme, of the Ministry of Rural Development.

4. Establish Secure Tenurial Rights Over Forest Lands Traditionally Used by Communities

Establish clearly defined tenurial rights and responsibilities, and gradually devolve management authority over communally used forest lands to self-governing and gender-neutral community institutions or *van samitis/gram sabhas/panchayats*. The functioning of these institutions should be on principles of 'participatory' democracy based on collectively evolved norms and responsibilities for conserving biodiversity, including through appropriate demarcation of no-use and use categories/zones. The boundaries of community forests should be demarcated through transparent inter- and intra-community negotiations. Community entitlement to all timber and non-timber forest products and ecosystem benefits should be established, within conservation and sustainable use limits.

Grant *de jure* CPR rights under Section 28 of IFA, under PESA in Schedule V areas or under State Gram Panchayat Acts or other relevant laws, by developing appropriate rules under them.

The objective of community management of village forests should be conservation of biodiversity, while ensuring and increasing livelihood security. The guiding principle should be to build upon existing local livelihood uses, and customary and legal rights and the indigenous knowledge associated with them, instead of imposing standard prescriptions from above.

Where other forms of successful community management systems already exist, as in parts of the North-eastern states, or in areas where communities have evolved their own institutions and practices as in Orissa, Jharkhand and other states, the existing institutions and their management systems should be strengthened, while ensuring socio-economic and gender equity and conservation with sustainable use. Central, standardised institutional structures are not to be imposed in these areas.

Given the diversity of ecosystems, livelihoods and cultures harboured by them, common property rights regimes need to:

- Recognize and accommodate variable rights and responsibilities for multiple rights-holders and stakeholders, with safeguards for the rights of the resource-dependent poor and nomadic user groups;
- Provide for women's independent rights by making allocation of rights to all adults, instead of to households;
- Provide for communities to define the social boundaries of 'communities' that form community institutions, based on existing social relations, instead of these being externally determined on the basis of Revenue Village or Gram Panchayat boundaries; the state can facilitate dispute resolution in instances where inter-village arrangements cannot be worked out by constituting multi-stakeholder forums.

Justification: One of the root causes of the poverty and alienation of forest-dwelling (particularly *adivasi*), communities, has been the progressive erosion of their customary resource rights and community resource management institutions (see Section 5.2.2). However, initiation of participatory programmes like JFM and ecodevelopment has helped improve community-FD relations and forest condition at many sites, while also providing some sections of communities with improved access to forest products. Such programmes now need to address critical issues relating to community-based governance of common pool forest resources on the principles of sustainability, *de jure* security of resource use rights, the centrality of community livelihood needs, equitable benefit-sharing under the principle of communities having the 'first charge' on forest produce (Forest Policy 1988), and other issues pointed out in Chapter 6.1.5.3.



This could be attempted in two phases. The first phase could be co-terminus with the 10th 5-year plan where areas such as the 'Chhote Bade Jhad ke Jangal' (scrub areas) in MP, presently vested with the revenue department, and the Undemarcated Protected Forests in many states be brought under community control for sustainable management. Having learnt lessons with these lands, the second phase could be to invoke Section 28 (relating to 'village forests') of the Indian Forest Act in Protected/Reserve Forests, where the community in tandem with the FD has been able to resurrect forests.

Suggested Responsibility: MoEF, MoRD, MoTA, Ministry of Law and Justice, relevant state departments including *Panchayat*, Forest, and Animal Husbandry, federations of CFM groups or JFM committees, federations of forest women's self-help groups and NTFP users, legal experts/advocates of tribal rights, mass tribal organisations, and tribal/indigenous women's organisations.

Time Frame: 5 years.

Steps:

As above for *Actions 2 and 3*, appropriately modified for forest lands.

Ongoing Relevant GOI Schemes/Programmes:

(i) Joint Forest Management (JFM) programmes under Conservation of Natural Resources programme, (ii) National Afforestation Plan of the National Afforestation and Eco-development Board, under the programme Regeneration and Development, of the MoEF.

5. Develop an Ecologically and Socially Sensitive Land Classification System

Develop a land classification system which records and considers ecosystems and the biodiversity harboured by them as well as the customary and current user groups and their livelihood systems.

Justification: Land classification systems in India are not necessarily based on considerations of their natural characteristics, the biodiversity they contain, or the customary or traditional uses to which they have been put. This often creates the ground for allocations of land use that are inimical to the local biodiversity or customary uses, as for instance in the case of the many 'wastelands' development programmes. More scientific and socially sound classification systems would help avoid the ecological and social damage and the conflicts that the conventional systems have created.

Suggested Responsibility: MoRD, MoEF, Ministry of Law and Justice, along with state Forest, Revenue, *Panchayat*, and other relevant departments, and institutions/NGOs working on land use issues.

Steps:

- i. Use available ecological and socio-economic maps and surveys, and those proposed under *Section 7.1.1.1, Action 2* (Biodiversity Conservation Atlas), and *Section 7.1.4.4, Action 1* (Livelihood Survey), as a base to classify lands and water bodies;
- ii. Replace use of the term 'wasteland', for common lands used by pastoral (both nomadic and settled) and other communities, by terms that denote their actual uses; this would be with the objective of facilitating informed land use planning based on recognition of the biodiversity of the lands and the customary rights of traditional user groups.
- iii. Introduce comprehensive cost-benefit analysis for all land acquisition, which takes into account not only the economic value of the property or resource acquired but also the potential impact on biodiversity, and also the long term socio-cultural effects of displacement.
- iv. Define the concept of 'public purpose' for land acquisition clearly, and make *prior and informed consent* of the owners mandatory for any land acquisition by the state.

6. Endow Ownership Over NTFPs to Communities, with Conservation Responsibilities and Equitable Rights

Develop an operational framework to implement PESA's requirement that the ownership of MFPs (NTFPs) should



be endowed to *gram sabhas/panchayats* at appropriate levels in Schedule V areas. Extend the provision even to non-Schedule V areas in all states, as partially done in Orissa and fully done in Madhya Pradesh (see Section 6.1.5.2). In doing this, ownership should be defined to include the right to use, manage and benefit fully from the produce, the responsibility of ensuring its conservation and sustainability, and the responsibility to ensure that such use and benefits are equitable. Ownership should not include the right to alienate the resource or cause its irreversible destruction.

Develop self-governing institutions of NTFP collectors for collection, processing and sale and ensuring conservation, while exercising prudent NTFP-extraction processes giving priority to local consumption needs.

Develop an institutional framework which i) clarifies and protects the primary rights of the collectors *vis-à-vis* other members of the community, ii) specifies the division of roles and responsibilities between the *gram sabha/panchayat/van samitis* and collector groups/organisations for ensuring sustainable NTFP collection, and, iii) provides a clear basis for the distribution of costs and benefits between the collectors and the larger community. A tentative framework could require the *gram sabha/panchayat/van samiti* to sub-allocate collection rights to groups/organisations of collectors for a nominal fee, on the condition that equitable and sustainable collection norms shall be adopted. The role of the *gram sabha/panchayat* would be to monitor the latter and impose penalties for destructive practices. Self-governing primary cooperatives of collectors would be responsible for sustainable collection, marketing and processing of NTFPs as well as improving the condition of the resource. The primary cooperatives should develop their technical and marketing federations for improving returns. The forest departments and other government agencies should provide technical and facilitative support, primarily on demand, and ensure minimum support prices. Representative multi-stakeholder forums at cluster, block, district and state levels should be responsible for overall monitoring.

Justification: An institutional framework ensuring secure rights of access and sustainable utilization of NTFP has tremendous potential for conserving biodiversity, while reducing poverty and enhancing livelihood security for impoverished forest-dwellers (especially given the tremendous value of NTFPs for such communities, as described in Section 4.2). PESA's provision for endowing ownership over MFPs to *adivasi* communities is intended to reverse some of the acute inequities generated by earlier policies. In many states there has been significant devolution of control and benefit-sharing arrangements over a range of NTFPs; however, simultaneously in many other areas, a complex array of laws, regulations and administrative orders and institutions are causing further alienation of forest communities from many NTFPs.

Extending PESA's provision to all the states and in non-scheduled areas could go a long way towards addressing these issues.

In addition, PESA by itself does not distinguish between NTFP collectors and non-collectors within village communities. Traditional NTFP collectors are often amongst the poorest women and men within their communities (although NTFP trade tends to be controlled by powerful exploitative cartels). In villages with high social stratification, transfer of NTFP ownership to the general *gram sabha* and/or *panchayat* could actually work against the interest of the collectors, with elite local leaders imposing collection charges or other restrictions on them. *Panchayats* could also auction collection rights to traders leaving the collectors as prone to exploitation as before. It is primarily the collectors who have the greatest stake in ensuring sustainable harvesting and management practices for maintaining the quality of their resource base. The evolution of a system of management and control which accounts for these factors is therefore urgently required. This would also aid in the discharge of the responsibilities of the proposed Biodiversity Management Committees under the Biological Diversity Act, 2002.

Suggested Responsibility: Ministry of Tribal Affairs, TRIFED, MoRD (PRI Department), Ministry of Law and Justice, MoEF, state governments and equivalent state departments, DST, Ministry of Social Justice and Empowerment (Women and Child Development Department), Cooperative Departments; associations/federations of NTFP collectors; experts in cooperatives/federations, appropriate technology, marketing, and capacity-building; social activists, and respected tribal/indigenous women and men leaders from Schedule V and VI areas.





Time Frame: 3 years.

Steps:

- i. MoRD (Department of PRIs), together with MoTA, MoEF and Ministry of Law and Justice (MoLJ), to set up a joint task force to initiate a systematic review of all laws, administrative orders, rules and regulations governing collection, processing and sale of NTFPs, and ensure that they are made consistent with the provisions of PESA (extended to non-Schedule V areas also); State Governments could be provided some incentives to hasten this process;
- ii. The artificial division between 'NTFPs' and 'MFPs', resorted to by some state governments (e.g. Maharashtra and Orissa) to keep the valuable NTFPs out of PESA's purview, needs to be done away with; MoEF to issue a notification clarifying that MFPs mentioned in PESA mean *all* forest products other than timber and wild animals, harvestable on a non-destructive basis, as also spelt out in the Expert Committee Report on endowing ownership rights of MFPs on Panchayats/Gram Sabha, MOEF, 1998;
- iii. MoRD, MoTA, MoEF and MoLJ to issue a joint clarification to all state governments with Schedule V areas that 'ownership' cannot be equated with only sharing or returning the net income from sale of nationalized NTFPs to PRIs/collectors; as already clarified by the MoLJ, ownership includes the right to collect, market, process and *manage* (but not alienate or cause its irreversible destruction) the resource; this should be supplemented with the elements mentioned at the beginning of this Action;
- iv. The JFM orders of all states with Schedule V areas should be suitably modified to clearly endow such ownership rights over all NTFPs (both nationalised and non-nationalised) to communities;
- v. Information about PESA's provisions for endowment of NTFP ownership to *gram sabhas* should be widely disseminated by the field staff of Rural Development, Tribal Development, Women and Child Development Departments and Forest Departments as well as through PRIs and NGOs;
- vi. Each block/district with forest areas to undertake participatory mapping of the resource collection landscapes of different NTFP groups; in areas with overlapping jurisdiction, develop suitable fora to facilitate negotiation of access rules and division of roles and responsibilities between different communities;
- vii. Undertake participatory mapping of NTFP availability; inventorise major NTFPs and collate market information on prices, volumes and endues, and assign an importance value to NTFPs. Disseminate this information widely to all GPs/Gram Sabhas.
- viii. Collectors/producers' organisations (local and federations) to take up the following activities with support of government agencies:
 - Listing and categorizing locally available NTFPs
 - Access to information on prices and fluctuations
 - Understanding the market and taking appropriate decisions
 - Local-level processing (individual/ group) with quality and cost standards, to add value
 - Monitoring to ensure that over-exploitation is not taking place
 - Activities oriented to conserving the resource and the biodiversity dependent on it.
- ix. The above measures should gradually be extended to non-schedule areas in all states.

Ongoing Relevant GOI Schemes/Programmes:

- Conservation and Development of Non-Timber Forest Produce including Medicinal Plants Scheme, under National Afforestation and Eco-development Board, of the MoEF
- Science and Technology Application for Rural Development sub-programme under Societal Programmes of Ministry of Science and Technology.
- (i) Grant-in-Aid to State Tribal Development Co-operative Corporations and Other such organisations scheme and (ii) TRIFED, under Ministry of Tribal Affairs

7.1.5.2 Strategy: Develop a Socially and Ecologically Sensitive Process for Dealing with Disputed Claims and 'Encroachments' on 'Forest' Lands

(see also *Strategy 7.2.5.1, Action 3*)

Actions

(Note: Most of the actions below are supported by Circular No. 13-1/90-FP, Ministry of Environment and Forests,

dated 18.9.1990, addressed to the Secretaries of Forest Departments of all states/UTs. These actions should also be seen in the context of the general need for *in situ* conservation and sustainable use, and the need to deal strictly with vested interests and destructive 'development' processes that impinge on forests, as expressed in the strategies in Sections 7.1.2 and 7.1.4).

1. Prepare Accurate Database and Maps of the Legal Status of Notified Forest Lands and 'Encroachments' on them According to Official Records

Prepare, or update, an accurate database and detailed maps at an appropriate scale, of the current legal status of notified forest lands, and of settlements or uses that are officially considered 'encroachments' on these lands; overlay these maps with actual forest cover maps. Use available satellite imagery as an input into these maps.

Justification: Encroachments on government forest lands can only be identified in relation to clear establishment of state ownership notified in accordance with law and demarcated on the ground. Final notifications, after survey, settlements and demarcation under the IFA, of large areas shown as government forest lands by state Forest Departments (particularly after enactment of the FCA) are however yet to be issued in the case of several states.

Suggested Responsibility: MoEF, MoRD, MoLJ, MoTA, FSI, SC and ST Commission, Ministry of Science and Technology, and state Forest, Tribal Development, and Revenue departments, local community organisations and people's movements, and relevant NGOs.

Time Frame: 3 years

Steps:

- i. MoEF to issue instructions and guidelines for preparing such a database and maps to all states and UTs, specifying a clear time frame. The maps should have uniform colour or other coding for a) Reserve Forests, b) Demarcated Protected Forests, c) Village Forests, d) Undemarcated Protected Forests, e) Unclassed forests (with details of the ownership and current use of such lands, and reasons for classifying them as unclassified forests, since the IFA does not provide for this category). Forest lands for which final notifications under the IFA have been issued should be clearly distinguished. For all other forest lands, the current status and actions required for completion of notification procedures under the IFA should be listed.
- ii. Overlay on the above maps: (a) location, area and numbers of officially recorded pre- and post-FCA 'encroachments'; (b) location, area and numbers of households in forest villages and other habitations, and, (c) lands under shifting cultivation.
- iii. Once State/UT governments have prepared such maps with help from relevant technical institutions, using satellite imagery where available and relevant, display these maps at local public places for scrutiny and verification. The latter should be widely publicized and the assistance of community leaders and NGOs solicited in filling gaps where identified.

Ongoing Relevant GOI Schemes/Programmes:

- All-India Soil and Land Use Survey Schemes (AISLUS) under Ministry of Agriculture
- Scientific surveys and services through Survey of India and National Atlas and Thematic Mapping Organisation (NATMO), under Ministry and Science and Technology.

2. Tally Forest and Revenue Department Land Records

Compare and harmonise the land records and maps of the Forest Department with those of the Revenue Department.

Justification: Many lands claimed to be forest lands are entered in revenue records as revenue lands of different categories, and/or vice versa, with jurisdictional disputes between the two departments. This has caused confusion regarding management priorities, insecurity amongst communities using the lands and resources on them, and a situation that vested interests are able to exploit for their own purposes. This has also resulted in state



Revenue Departments issuing *pattas*, leases or other assignments to villagers under due authority of the government, on lands which Forest Departments claim to be theirs. It is therefore critically urgent that the respective land records of the two departments be harmonized, and the disputes related to *pattas*, leases, etc. be resolved. Care should be taken that *actual forest cover is not reduced as a result of this*.

Suggested Responsibility: MoEF, MoRD, state Forest, Tribal Development, and Revenue Departments, National Commission of SC/STs, village institutions including PRIs, people's movements and relevant NGOs, with help from remote sensing institutes.

Time Frame: 3 years

Steps:

- i. MoEF, MoRD and MoTA should in consultation with the NCSCST, jointly issue instructions to all state governments and UTs to get their Revenue and Forest Departments to complete the exercise within a realistic but fixed time frame, and in a transparent manner so that there is public scrutiny of the exercise;
- ii. The legal land record status thus obtained should be overlaid on the FD's maps prepared under *Action 1* of this section;
- iii. Forest lands for which final notifications have been issued after completion of all required procedures, but which still figure in RD records as revenue lands, should be mutated as forest lands. All relevant revenue records, including those with the field level revenue officials, should ensure that the maps are revised accordingly and forest areas (with appropriate colour coding) are shown therein. All disputed claims related to forest lands and disputes related to *pattas*, leases, etc. issued by the Revenue Department for these lands should be simultaneously resolved in accordance with the relevant MoEF circulars of 18.9.1990.
- iv. For all other cases of revenue or forest lands, including those declared 'deemed forests' several decades ago, actions suggested in *Action 3* below need to be followed.

3. Complete Survey and Settlements for all Forest Lands Yet to be Demarcated or Finally Notified

Finish surveying and settling all forest lands that are not yet demarcated or finally settled.

Justification: As noted by the SC & ST Commissioner (1991), comprehensive recording of pre-existing settlers and completion of all procedures for final notification as forests has not been done even for many of the forest lands under the FD's exclusive jurisdiction. In many states (Orissa, MP, Chhattisgarh, HP, others), despite blanket notifications declaring huge areas of uncultivated lands as state-owned forests more than 50 (sometimes 100) years ago, no demarcation on the ground has yet taken place. The land rights of large numbers of people inhabiting them *prior to their declaration as forests* are yet to be settled. In some cases they have been given *pattas* (titles) for these lands by state Revenue Departments, or were eligible for regularization of their 'encroachments' under revenue laws.

Suggested Responsibility: MoEF, MoTA and MoRD, with state Revenue, Tribal and Forest Departments, NCSCST, PRIs, relevant NGOs, and community institutions and associations.

Time Frame: 5 years.

Steps:

- i. Develop a specific programme for those people whose ancestral land rights have still not been enquired into or recognised (as in most hilly, *adivasi* dominated areas in Orissa); survey and settle such areas at the earliest, pending settlement of rights, such lands should not be assigned to any other purpose, including those related to development projects. The MoEF circular of 1990 could be used to expedite settlement of rights in all such lands, with reference also to the framework for resolving conflicts concerning forest lands provided by the then Commissioner of Scheduled Tribes and Schedules Castes (Sharma 1991).
- ii. Ensure that only lands with existing forest cover are mutated as forest lands in the records of both revenue and forest departments, including lands from among those presently classified as Undemarcated Protected Forests or other similar classification (such as the orange areas in Madhya Pradesh and Chhattisgarh). The



legal classification of lands without forest cover should be determined within a holistic land use policy framework, taking into account their ecological characteristics, current uses and role in supporting local livelihoods or for other purposes. Community forests and grazing lands presently under the control of revenue department and marked variously as *Chhote Bade Jhad Ke Jangal*, *Gramya jungles*, etc., may be vested with *Gram Sabhas* for management, with legally protected common property rights under the Panchayat or other relevant laws, with a caveat that no change from the existing land use of such lands will be permitted.

4. Initiate a Systematic Strategy of Addressing Disputed Claims and Encroachments on Lands Finally Notified as Forest Lands

Work out a viable strategy for dealing with disputed claims relating to forest lands that have been clearly demarcated, settlement of rights completed, and final notification issued. Even in such lands, in many states the rights of large groups of forest-dwellers, particularly shifting cultivators and Primitive Tribal Groups, have not been properly recorded. Such groups should not be automatically classified as 'encroachers'. On the other hand, where encroachments have caused 'honeycombing' or serious fragmentation of forests, and where these are eligible for 'regularisation', a process of consolidation of the landholdings and settlements should be attempted, to allow large contiguous forests to regenerate (MoEF Circular No. 13-1/90-FP, dated 18.9.1990).

Justification: The strategy for such lands would differ from the strategy for other kinds of land, since there is comparatively less legal confusion here. While clear post-1980 encroachments by commercial and vested interests and outsiders would invite summary eviction, poor forest-dwellers could be encouraged to take up forest regeneration and NTFP-based or alternative sustainable livelihoods on the same lands with appropriate inalienable deeds. This needs to be decided on a case-by-case basis, taking ecological/biodiversity concerns and social considerations into account.

Suggested Responsibility: MoEF, MoTA, MoRD, state Revenue, Tribal and Forest Departments, along with PRIs, forest-dweller and community institutions, social action groups, and NGOs working with them.

Time Frame: 3 years.

Steps:

- i. In cases of forest lands where jurisdictional disputes with the revenue department have been resolved and final notifications issued, develop time-bound schedules for resolving disputed claims and dealing with encroachments by undertaking the following:
 - a. Set up district-level teams with Tribal (in the case of tribal areas), Forest and Revenue officials as per MoEF circulars of September 1990, for dealing with disputed claims, other disputes and encroachments.
 - b. Widely disseminate information about the dispute resolution/regularization process, documents/evidence required and the time schedule for different villages, by beat of drums (or other traditional methods), distribution of hand bills, announcements through radio and the local press, and posters;
 - c. Simultaneously deal with regularisation of pre-1980 occupants/encroachments, disputed claims over forest land, and disputes regarding *pattas/leases*, etc., in accordance with MoEF's guidelines dated 18.8.1990, the orders of the Supreme Court in WP 1778/1986 (Pradeep Prabhu v/s State of Maharashtra) dated March 7, 1995, and the framework for resolving conflicts concerning forest lands developed by the Commissioner, SCs/STs in 1991. Give special attention to shifting cultivators and Primitive Tribal Groups;
 - d. Undertake the above measures through a transparent and well publicized, village based public hearing process. Build upon relevant best practices from across the country.
 - e. Divide those found ineligible into two categories: (a) well-off, non-local people who have clearly encroached on notified forest land after 1980, and (b) poor villagers/*adivasis* who admit being more recent settlers due to being evicted/displaced without rehabilitation from their original areas for development projects, or for other reasons like illegal alienation of their lands by non-tribals. Encroachers falling in category (a) may be given notices for eviction in accordance with the due process of law;
 - f. Develop a location specific-strategy for poor villagers falling in category (b) above, on the following principles:



- Provide viable livelihood alternatives for them as outlined in 'Resolution of Conflicts Concerning Forest Lands – Adoption of a frame by Gol' (Sharma 1991).
- Recognise that recent settlers forcibly displaced from other areas due to development projects or illegal alienation of tribal lands are likely to clear new forest areas or encroach on other common lands for settling down if summarily evicted from their current sites. On a case-to-case basis, using ecological/biodiversity and social criteria, it may be more viable to regularize them where they are with appropriate agroforestry or forest-based livelihoods, or to provide them viable alternatives that do not violate the FCA.
- Where prior occupation/encroachments have caused honeycombing and serious fragmentation of forests, and where these are eligible for 'regularisation', a process of consolidation of land-holdings and settlements should be attempted to allow large contiguous forests to regenerate (MoEF Circular No.13-1/90-FP, dated 18.9.1990).

Such a process of dispute settlement and regularization of encroachment is not in violation of the FCA. Alternative models exist, some already in place, e.g. agroforestry involving the use of inter-spaces between trees for cultivating medicinal plants. The MoEF has recently suggested such a model to the Tripura Government, which can even be used within Protected Forests. These arrangements could provide viable livelihood alternatives. Villagers can be encouraged to organize themselves as SHGs or cooperatives to take charge of cultivation, processing and trade of medicinal plants and other forest produce.

- Bring in an amendment to the rules for regularization of 'encroachments' under the FCA, with strict safeguards against outsiders exploiting this provision.

5. Reclassify Long-Standing, Traditional Shifting Cultivation Lands as Forest Fallows

Reclassify areas, which have been under shifting cultivation for generations, under appropriate land use categories that combine conservation and livelihood functions. This would apply especially to the north-eastern states, but also to parts of Orissa, Andhra Pradesh, and some other states. These lands need to be supported to regain sustainability through appropriate cropping and agroforestry practices, but should remain under the control of communities and families within them (*see also Section 7.1.5*). Appropriate ground-level and satellite mapping, community mobilisation, and strong incentives and disincentives put into place by state agencies could help to reduce the extent to which traditional cultivation rights are misused to take over new forest areas for non-forest uses.

Justification: In contrast to settled cultivation, where natural vegetation is given no opportunity to re-grow, shifting cultivation permits regeneration in cycles; at any given moment, therefore, parts of the cycle may be 'forested'. However, to treat these legally as 'forest lands', and therefore automatically label shifting cultivators as encroachers or forest destroyers, is to not recognise the reality that this is a unique form of land use often suited for such ecosystems, and is associated with rich indigenous knowledge and agro-biodiversity ensuring household food security. The major problems faced by shifting cultivators have been their poorly recognised CPR rights, and, of late, the decreasing viability of their cultivation practices, as shifting cycles have become shorter due to a number of factors (*see Section 5.2*). In the north-eastern states, despite constitutional protection for communal ownership and customary land use, the FSI includes shifting cultivation lands under its assessments of 'forest cover'. The FAO, on the other hand, treats them as 'forest fallows' and not as 'forest cover' (FSI 2000). Such lands should be recorded as a separate land use (e.g. *jhum* fallows or forest fallows) and the plans of undertaking large-scale plantations on them should be stayed. Instead, traditional community institutions should be supported in developing adaptations to their customary practices, including through appropriate crop and crop-tree mixes or agroforestry, to make them sustainable under present circumstances, to promote natural succession and regeneration, and to reduce the need for expansion of agriculture into new areas.

Suggested Responsibility: MoEF, MoRD, MoTA and MoA; with state Revenue, Rural Development, Tribal Welfare, and Forest Departments; the North-East Council; shifting cultivator community institutions and village councils; and NGOs and academics with good understanding of this issue.

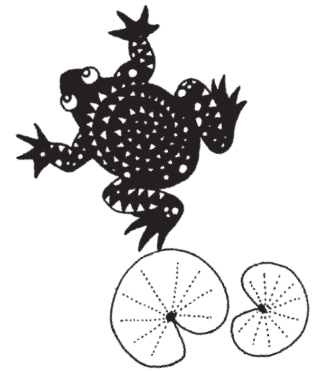
Time Frame: 5 years.



Steps:

- i. Use existing maps of FSI and other institutions to identify all areas where shifting cultivation has been traditionally practiced, record such areas under a different category as *jhum*/forest fallows (followed by FAO), and ensure tenurial security to the traditional users;
- ii. Facilitate cultivators in restoring the sustainability of shifting cultivation practices, while revitalizing traditional institutions linked to the practice, through ecologically and culturally appropriate mixes, including agroforestry (see Section 7.1.4).

The above steps could be linked to MoEF's programme, appropriately modified, on Shifting Cultivation (*Jhum*) under Regeneration and Development.



6. Use the Database and Mapping Generated Above, to 'Freeze' Any Further Illegal Incursions into Forests

'Freeze' the current status of encroachments, using the database and mapping mentioned in *Action 1* of this section, as a base to ensure that no further illegal incursions are made into forests, and to determine any future encroachments that may take place. Such a freeze should include no further regularisations of encroachments, which would clearly show up as new, on the basis of the database and maps.

7. Ensure Secure Land Tenure to Forest Villages

Assess current land use patterns in forest villages, and provide secure tenure to residents, including through conversion into revenue villages.

Justification: Security of land tenure to the forest villagers has remained a key issue. Presently, the Forest Department assigns 15-year temporary *pattas* or leases (as in Madhya Pradesh and Chhattisgarh), which can be renewed or transferred through inheritance. There are, however, no clear-cut land records as in the case of revenue village residents. MOEF's circular of 18.9.90 recommends that forest villages may be converted to revenue villages after denotifying the concerned land. This process should provide for heritable but inalienable rights to the forest villagers. While converting the Forest Villages to Revenue Villages, the administration of these and other Revenue Villages enclaved in forest areas should preferably be entrusted to the State Forest Departments where appropriate. Such conversion does not attract provisions of the FCA *in toto*, particularly the one regarding compensatory afforestation. The case of forest villages inside PAs may need to be dealt with differently, as in most cases the settlement of rights is still in progress. While dealing with forest villages within PAs, the potential impacts that such a change in village status will have on wildlife habitats and populations, as well as on the rights of long-standing inhabitants, will need to be assessed on a case-by-case basis, in consultation with the affected villagers.

Suggested Responsibility: State Forest Departments in association with Revenue Departments, Tribal Welfare Department, relevant NGOs and people's organisations, and village-level bodies.

Time Frame: 3 years.

Steps:

- i. Detailed surveys of all forest villages to be taken up in a systematic manner within a stipulated time frame by combined teams of forest, revenue and tribal development department officials, in collaboration with community members, through a well-publicized and transparent process. Such surveys should record the cultivable landholdings and the area thereof, the area under habitation and the land within the forest village boundary meant for their resource/*nistar* needs.
- ii. The proposal for denotification under the FCA to be prepared simultaneously for approval of the MoEF. A copy of the proposal should also be made available to each of the concerned villages, in local languages.
- iii. Detailed land records and maps be prepared for the land holdings (as prevalent in the case of revenue records).
- iv. All the cases for transfer of titles (inheritable but inalienable rights) be expedited on the same line as done in case of revenue villages.

7.1.5.3 Strategy: Ensure Equity in Ongoing Ecosystem Management Initiatives

Actions

1. Ensure that Socio-Economic and Gender Equity is Mainstreamed into JFM, Community Forest Management (CFM), Watershed Management, and Forest Development Agencies (FDAs)

Undertake a systematic review of both central and state government guidelines/orders for JFM/CFM, watershed management schemes, as well as of centrally-sponsored schemes such as NAEB's National Afforestation Plan (NAP) which provide financial support for JFM through FDAs, to ensure gender and socio-economic equity are mainstreamed in them.

Justification: As described in Chapter 6, most current initiatives at JFM/CFM, afforestation, and watershed management inadequately address issues of inequity between official agencies and communities on the one hand, and among community members on the other. The severely underprivileged sections often get left out, at times even further marginalized, where the relevant committees are dominated by the landed rural elite. Women are still often outside the decision-making circles. Guidelines for all these programmes and their implementation will need to incorporate special measures to increase equity, as has begun to take place in a number of states.

Suggested Responsibility: Ministry of Environment and Forests to lead, in collaboration with Ministries of Tribal Affairs, Social Justice and Empowerment, Law, Rural Development, Agriculture, and Animal Husbandry, the process to include respected women and men tribal leaders, representatives of federations of CFM/JFM and watershed management groups, and academics, lawyers and social activists well-versed with livelihood, water, and forest rights. Similar processes with multiple rights-holders and stakeholders should be initiated by Forest Department, Water/ Watershed Department, and other relevant agencies of state and UT governments.

Time Frame: Guidelines within a year, implementation ongoing thereafter.

Steps:

- i. MoEF and MoTA to set up a working group to formulate a set of guidelines, to be issued to all relevant agencies at state and local levels, regarding ways and means of increasing equity in all JFM/CFM initiatives, watershed programmes, and FDA institutions (for an example, see proposed Karnataka model, Box 6.43); for this also learn from existing initiatives at tackling inequities (e.g. Saigata village, see Box 6.44)
- ii. Areas brought under JFM/CFM/FDA and watershed management to be demarcated respecting locally recognised community and resource use boundaries based on customary use, rather than administrative revenue village boundaries or discretionary 'allocations';
- iii. For each patch of forest brought under community management, conduct participatory review of people's customary and traditional rights and livelihood uses, as elaborated elsewhere in this section and Section 7.1.4;
- iv. The rights and livelihood uses thus recorded should form the basis of JFM/CFM/FDA/watershed agreements with forest/revenue departments or *gram panchayats*, thereby enshrining community rights and concomitant responsibilities;
- v. All such agreements with forest/revenue departments or *gram panchayats* should be legally binding. The resulting security of tenure would enable the communities to make long-term investment in the resource, while increasing accountability of departmental staff and *panchayat* institutions to villagers;
- vi. The new silviculture and microplan prescriptions must address these issues of equity, and build upon indigenous knowledge of women and men and community management traditions;
- vii. The participating communities should be entitled to all forest products in line with the 1988 Forest Policy;
- viii. Women's independent resource rights and entitlements should be explicitly secured and their 'participation' not confined only to 'membership'. Mechanisms for facilitating poorer women organising themselves into homogenous groups to increase their self-confidence and voice in *gram sabha* decision-making should be put in place; for this the field staff of the Women and Child Development, Rural Development, Health, and Education Departments, as well as NGOs, should be drawn upon.



- ix. Enhance the capacity of local communities to govern themselves, and strengthen transparent governance mechanisms;
- x. The accountability for both community and government funds spent on community forests and wetlands must rest with the *gram sabha* or its appropriate committee(s); the fund should be directly routed to the *gram sabha*/committee account;
- xi. Set up conflict resolution forums at different levels (village, multi-village, block, district, state), consisting of gender-balanced representation of all rights-holders and stakeholders; community institutions should be encouraged to develop their own federations/associations for playing conflict resolution roles (as in Gujarat, Orissa, Andhra Pradesh and other states);
- xii. State forest and watershed/rural development departments and MoEF/MoRD should centrally involve community institutions and their democratic associations/federations in all revisions of JFM/CFM/FDA/watershed management guidelines;
- xiii. Mutually supportive links between PRIs and JFM/CFM/watershed groups should be developed through broad-based consultations; committees to handle these activities once approved/constituted by the *gram sabha*/village general assembly, should be oriented towards strengthening and reinforcing the assembly's functioning rather than duplicating its work (this also requires modification of the guidelines of NAEB's National Afforestation Plan (NAP) relating to the Forest Committee's tasks on building schools, managing common lands and water bodies);
- xiv. Provide for nested control over community income and funds by smaller, more homogenous groups, ensuring that at least 33% of 'community' funds are controlled by women's groups;
- xv. Make available all relevant information in local languages to communities through the JFM/CFM/FDA and watershed programmes.



Ongoing Relevant GOI Schemes/Programmes:

- i. (a) Joint Forest Management (JFM) sub-programme under the Conservation of Natural Resources Programme, suitably re-oriented, (b) National Afforestation Plan, National Afforestation and Eco-development Board, under Regeneration and Development Programme of Ministry of Environment and Forests.
- ii. Relevant watershed programmes of Ministry of Rural Development.

2. Initiate Participatory or Joint Protected Area Management

For details, see Section 7.1.2.1, Action 7.

3. Integrate Principles and Practices of Socio-Economic and Gender Equity into all Other Community-Based Natural Resource Management Programmes

Infuse all programmes for natural resource management (other than those dealt with in *Actions 1&2* above), which involve communities, with principles and practices of equity within the community. This should include equity in different spheres: decision-making, implementation, monitoring and benefit-sharing. It should also include all community groups, with a special focus on underprivileged sections like landless groups, 'lower' castes, adivasis in mixed populations, nomads in certain situations, and in particular women within all of these.

Justification: Biodiversity has multiple users, with potentially conflicting interests. This could be between two or more communities, or between sections of the same community. Communities are neither homogenous nor equitable. Stratification and inequalities have been exacerbated by the dynamics of internal change within communities. These include inequalities based on class, caste, tribe and ethnicity, and within these by gender, and age; changing lifestyles and norms demographic patterns including localised increases in population due to immigration, or other factors such as large scale presence of the security forces in certain biodiversity-rich regions, etc. Poverty in rural areas is closely intertwined with differential access to and control over natural resources by different socio-economic groups, both in the private and common resource pools.

Although both women and men take care of food production and other household needs, the responsibilities for taking care of crops, looking after nurseries, compost and animals, gathering from forests and common lands,

etc., are often in the hands of women. The invisibility of women as farmers, workers, extension agents and decision makers results in their being ignored by mainstream development programmes, depriving them even of access to information and feedback. Gender and poverty issues therefore need to be linked with production systems and securing women's entitlements.

Suggested Responsibility: Panchayat Raj institutions, Departments of Women and Child Development, Ministry of Rural Development, Ministry of Tribal Affairs, Ministry of Water Resources, MoEF, Department of Ocean Development, Ministry of Science and Technology, with NGOs, mass tribal organisations, and federations of user groups.

Time Frame: 2 years for programme integration; implementation ongoing.

Steps:

- i. Assess all ongoing biodiversity-related programmes (other than those dealt with in *Actions 1 & 2* above such as fisheries, participatory irrigation management, and others), and integrate equity considerations into them, both as an explicit goal as well as a means;
- ii. Document successful initiatives at tackling community inequities, and disseminate the lessons from such examples;
- iii. Enhance the capacity of women and other underprivileged groups to exercise their legitimate rights to participate in ecosystem and species management decision-making, and entitlement to the produce and services; for this, link up with Associations and Federations of local women's and other user groups, Mahila Samakhya groups and SHGs; build upon and strengthen existing women's organizations;
- iv. Build processes that monitor PRIs' fulfillment of the responsibility to integrate equity into all their programmes, and link incentives and external financial support to such integration.

Ongoing Relevant GOI Schemes/Programmes:

- Technology Mission for Integrated Development of Horticulture in Northeastern Region including Sikkim scheme, under Horticulture, Ministry of Agriculture.
- National Watershed Development Project for Rainfed Areas, and Externally Aided Projects under Rainfed Farming System, of the Ministry of Agriculture.
- Ministry of Agriculture (i) Centrally-Sponsored Scheme of Soil Conservation for Enhancing Productivity of Degraded Lands in the Catchments of River Valley Projects and Flood-Prone Rivers (RVP & FPR)-Subsumed under Macro Management under Natural Resource Management Programme, (ii) Scheme of Watershed Development Project in Shifting Cultivation Areas.
- MoEF Joint Forest Management sub-programme under Conservation of Natural Resources programme.
- Activities of the National Afforestation and Eco-Development Board under Regeneration and Development Programme of MoEF.
- Island Development sub-programme under Coastal Community Programme, of the Department of Ocean Development.
- CAPART, Ministry of Rural Development (i) Sampoorna Grameen Rozgar Yojana, (ii) Swarnajayanti Gram Swarozgar Yojana (iii) Integrated Wastelands Development Programme, (iv) Drought Prone Areas Programme, (v) Desert Development Programme, (vi) International Co-operation component under Other Schemes of Wasteland Development, (vii) Watershed Development Programme.
- Ministry of Tribal Affairs (i) Grant-in-Aid to State Tribal Development Co-operative Corporations and Other Such Organisations Scheme, (ii) Special Central Assistance (SCA) To Tribal Sub-Plan Scheme, and (iii) TRIFED,
- Societal Programmes, Ministry of Science and Technology
- Biotechnology-Based Programmes for Society Programme, Department of Biotechnology

7.1.5.4 Strategy: Protect Traditional Knowledge and Ensure Equitable Benefits from its Wider Use

(**Note:** In this section, the term ‘traditional knowledge’ is used to denote indigenous and other local community knowledge that has been inherited through generations; it also includes recent innovations by community members, which are based on such inheritance.)

Overall Justification: Considerable erosion of traditional knowledge is taking place due to a host of factors. Amongst these is the loss of pride in this knowledge, its seeming irrelevance in modern times, the active propagation of ‘modern’ knowledge systems at the cost of the traditional, the lack of full valuation of traditional knowledge, and the weakening of institutional structures that were earlier the propagators of this knowledge. Yet, it is becoming clearer that traditional knowledge, in its continuously evolving form, has considerable significance for achieving conservation, sustainable use and equity. Hence the need to take urgent steps for its revival, protection and modification to suit current contexts, as well as its wider application to generate benefits for its holders.

Actions

1. Build Capacity of Communities to Value and Protect Their Knowledge

Build the capacity of local communities, and in particular of women and other underprivileged groups, to understand the full value of their knowledge, including its value to the outside world; and to protect it from misuse through various means (including those given in actions below). Such capacity-building should take place through their own relevant institutional structures and through institutions working with these communities.

Justification: Traditional knowledge is not only valuable for those who possess it, but also has enormous value for the ‘outside’ world (see Chapter 3). In most cases, however, the knowledge holders are not aware of this wider value, nor of the various ways in which their knowledge can be misused or used by ‘outsiders’. This often leads to ‘theft’, where the knowledge is taken away without adequate information on what it is going to be used for, or unfair deals in which paltry and inequitable benefits are given to the holders. Communities (and individual innovators within them) need to be given full information of the value or potential value of their knowledge, and the capacity to protect it against misuse or theft. They also need protection against the threats of social devaluation and disuse due to the availability of modern alternatives. This can be done through appropriate forums, including their own institutional structures and associations, and through institutions that work with them.

Suggested Responsibility: *Panchayat* training institutions, Krishi Vigyan Kendras (KVKs), forest user group federations (as in Orissa, Gujarat, Karnataka and Andhra Pradesh), JFM networks, pastoralist and fisherfolk associations, small farmer organisations and relevant NGOs, with support from MHRD, MoEF, state departments of Education, Tribal Welfare and Women’s Welfare, and relevant institutions such as, Madras Institute of Development Studies, Cochin University of Science and Technology, etc.

Time Frame: Ongoing.

Steps:

- i. MHRD or MoEF to commission documentation of initiatives towards building capacity of local communities to value, use, and protect traditional knowledge; to learn lessons from them for wider application;
- ii. *Panchayat* and other training institutions, along with local NGOs, to devise a capacity-building programme for village level institutions and individuals;
- iii. Carry out programmes, through or by community-based organisations including PRIs, for such capacity-building, with appropriate inputs from other institutions and agencies;
- iv. Integrate relevant inputs and undertake reorientation of school and college curricula, so as to make them more sensitive to traditional knowledge issues and ways of learning.





2. Use Traditional Knowledge in Biodiversity Management Programmes

Integrate traditional knowledge as a central component in biodiversity research and management programmes, including biodiversity surveys, protected area management, forestry, fisheries, agriculture, coastal and marine area management, etc. Sensitize and increase awareness about traditional knowledge and its application through training of formal sector scientists and managers.

Justification: Though there is a lot of lip-service to the value of traditional knowledge, very few formal biodiversity research and management programmes actually integrate its use at best, such use is sporadic, divorced from the context of the knowledge system, and without involving its holders. The exceptions in India and abroad, where traditional knowledge has been respectfully integrated and its holders involved (see Boxes 6.11 and 6.12), show the enormous potential of such integration and partnerships in achieving better understanding of biodiversity, and more effectively conserving and sustainably utilising it. The proposed Biodiversity Management Committees under the Biological Diversity Act, 2002, would also need to build on traditional knowledge to effectively discharge their functions.

Suggested Responsibility: MoEF, MoTA, Ministry of Agriculture, Ministry of Social Justice and Empowerment, Department of Ocean Development, Ministry of Science and Technology, Department of Biotechnology, state Forest Departments, and NGO, communities, and groups involved in implementation of biodiversity management programmes.

Time Frame: 3 years for a sample of projects and processes; ongoing for the rest.

Steps:

- i. Document existing cases of utilisation of traditional knowledge in formal biodiversity research and management programmes, and lessons from these (see Section 6.1.1.2);
- ii. Apply these lessons for integrating the use of such knowledge into all biodiversity management programmes, including the sectors mentioned in the preliminary paragraph in this section;
- iii. Sensitize all stakeholders, including Forest, Fisheries, and Agriculture Departments, as well as Social Services and Women's Development Departments, to traditional knowledge systems by organizing training programmes for them, conducted with knowledgeable local women and men as resource persons;
- iv. Create, in each such programme, joint teams for research, management planning, implementation and monitoring, consisting of experts from local communities and from formal institutions and government departments; to start with, create such teams for the ongoing national surveys by FSI, ZSI, BSI, NIO, etc., and for a sample of protected areas, forestry and fishery projects, KVKS, and coastal management plans.

Ongoing Relevant GOI Schemes/Programmes:

- Research Programmes in MoEF
- Marine Research and Capacity-Building Programme, Department of Ocean Development
- Research and Training Programme, Ministry of Tribal Affairs
- Scientific Research, Ministry of Science and Technology
- Seminars/Symposia/Conferences Scheme under Human Resource Development Programme, of the Department of Biotechnology
- Programmes being undertaken by the recently formed Institute of Bioresources and Sustainable Development, Imphal, NBDB

3. Carry Out Community-Based Documentation of Traditional Knowledge

Strengthen and expand ongoing processes at documenting traditional knowledge, through a community-based and controlled process of making Community or People's Biodiversity Registers. Such programmes, should be facilitated by NGOs, community leaders and staff of departments such as Health, Education, Women and Child Development, Rural Development, Animal Husbandry, Water Resources, and Forestry. The programmes should also be included in the mandate of PRIs/GSs. Special attention should be given to recognizing gender- and socio-

economic status-based differences in traditional knowledge, ensuring that the documented knowledge is in the control of the village communities, and that the resulting documents are legally protected against biopiracy or other misuse. Due attention should be given to document community's own perspectives regarding traditional knowledge rather than just the perspectives of professional outsiders. The programme should also ensure that underprivileged sections of village communities are able to participate equally, and that their knowledge and interests are adequately represented in the Registers.

The considerable information generated under the All-India Coordinated Research Project on Ethnobiology should be made public and used as a base for the above documentation, with due safeguards against biopiracy. Lessons also need to be learnt from the initiatives of CES/IISc, Sristi, NIF, FRLHT, and other groups creating community or people's biodiversity registers (see more detailed recommendation on CBRs/PBRs, in *Strategy 7.2.6.2*).

4. Create a Network of Traditional Knowledge Holders and Databases at District, State, and National Levels

Create a network of exchanges and mutual learning amongst traditional knowledge holders (both women and men), and amongst CBRs/PBRs, at district, state, and national levels. Ensure that all knowledge registered at levels above the community (e.g. at district, state, and national levels), has effective protection measures against theft and misuse, and is able to pro-actively seek the consent of the original holders in cases where specific holders are identifiable. This protection should extend to the ongoing Traditional Knowledge Digital Library, the earlier All-India Coordinated Research Project on Ethnobiology, and other such initiatives by government and non-government agencies.

Such a network should be linked to the proposed Indian Biodiversity Information System (*see Strategy 7.1.1.2*), and build on initiatives such as that of the National Innovations Foundation.

5. Develop a Community-Based Intellectual Rights Systems

Develop a community-based intellectual rights regime, which is sensitive to gender and socio-economic status, and suited to India and its communities, rather than blindly following any international model. This can be done under the appropriate provisions in the Biological Diversity Act, 2002, or as a separate legislation. While focusing on the community and the collective context, such a regime should also include and honour individuals and sub-groups with special skills, knowledge, and innovations. The regime should also respect a range of situations, ranging from those where communities and individuals do not want to commercialise or monopolise their knowledge, to those where the knowledge-holders want to keep it to themselves for reasons of legitimate public good (since they fear that if not properly taught, it could be misused). The regime should also encompass community ownership rights and benefit-sharing rights over germplasm/knowledge that has already been collected from them, and stored in gene banks, museums, libraries, and databases.

Any such regime must also recognise that knowledge cannot be dissociated from its cultural and institutional setting, and therefore also requires the protection of the natural resource rights and tenorial security of local communities (*see Section 7.1.5.1*). The regimes should recognise the right of free, prior and informed consent of communities (*see Box 7.1.5.1*), and the legitimacy of oral knowledge.

In developing this regime, models and systems that have already been recommended in India and abroad could be assessed.

Justification: None of the existing IPR regimes are suitable for the protection and propagation of traditional knowledge systems, in particular because of their private property focus and their stringent requirements of novelty, replicability, etc. On the other hand, though there has been considerable discussion on this issue within and outside India, there is as yet no satisfactory alternative regime for protecting traditional knowledge. Such a regime is urgently needed.

Suggested Responsibility: MoEF in association with MHRD, Ministry of Law and Justice, Ministry of Commerce, MoTA, Ministry of Social Justice and Empowerment, Ministry of Health and other relevant ministries, in associa-



tion with women and men experts from the formal and informal sectors who have worked on this issue.

Time Frame: 2 years to formulate; another year to promulgate.

Steps:

- i. MoEF to set up a working group consisting of the above-mentioned agencies and sectors, with the mandate of conducting a national participatory process to formulate a comprehensive regime for protection and propagation of traditional knowledge;
- ii. The working group to carry out a NBSAP-like process over two years, involving public hearings and consultations across all sectors and in different regions of the country, and culminating in a draft community intellectual rights regime; in so doing, the group to also consider the existing NBSAP report on Access, Benefit-sharing, and IPRs, draft community IP regimes such as those of Nijar (1996), GRAIN (1995), Shiva *et al.*, (1997), Posey (1996), Gopalakrishnan (2001) (currently under consideration of an Inter-ministerial Committee of the central Department of Education), Kerala Tribal Knowledge Protection Bill, and other relevant recommendations and reports from groups like Gene Campaign (1998), Srishti (Gupta 1996), National Innovations Foundation, etc.
- iii. The report to be converted into a draft Bill for introduction into Parliament, or as draft rules for notification under the Biological Diversity Act, 2002;
- iv. Once passed, the regime to be widely publicised, especially amongst local communities in their languages, so as to enable its effective implementation;
- v. Meanwhile, efforts to be made to repatriate, to the extent possible to the original communities, the traditional knowledge from existing centralised knowledge databases, such as the All-India Coordinated Research Project on Ethnobiology, the Traditional Knowledge Digital Library, etc.; such repatriation to communities of origin could serve as a powerful impetus to the renewed use of such knowledge for conservation and livelihood security;

6. Ensure Equitable Sharing of Benefits from the Use of Traditional Knowledge

Take legal and administrative measures to ensure that all benefits generated from the use of traditional knowledge (both within and outside India) are shared equitably with the relevant communities or knowledge-holding sub-groups of women and men within them. Benefits do not necessarily have to be financial, but could also be social, political or material, depending on the context and situation, and on the wishes of the knowledge-holders themselves. Benefits may accrue from as yet undisclosed knowledge, being documented under various initiatives, or from already published knowledge such as in relevant ancient or modern texts. For the former, the proposed intellectual rights system (Action 5 above) would need to ensure benefit-sharing. For the latter, where identification of the original knowledge-holders or developers may not be possible, benefits should accrue to the proposed national or state biodiversity fund (see Section 7.1.9.4, Action 12).

Justification: Most uses of traditional knowledge for wider benefits, especially in the fields of agriculture, pharmaceuticals, cosmetics, food processing, NTFP uses, etc., do not provide for equitable sharing of benefits with the holders of the knowledge. This is the case both with commonly held knowledge as also with knowledge held by individuals or single families/communities. The legal regime for traditional knowledge, proposed in Action 5 above, should also incorporate elements of such equitable sharing of benefits.

Suggested Responsibility: (as for Action 5, and adding ministries/Departments that are dealing with sectors using traditional knowledge including Health, Industry, etc.).

Steps:

- i. The working group mentioned in Action 5 above to develop guidelines on the full range of situations of benefit-sharing (including use of traditional knowledge for conservation, research and commercial purposes), on what constitutes 'equitable' benefit-sharing (particularly community women and men's notions of 'equitable'), and on how to ensure that such sharing takes place; organise wide consultations with community women and men to refine guidelines; give backing to these guidelines through appropriate rules under the Biological Diversity Bill/Act and/or other traditional knowledge protection regime as proposed in Action 5 above;



- ii. While developing these guidelines, the working group to assess lessons from previous experiences in India (such as the Kani-TBGRI experience, *see Box 6.48*), and other countries (cases compiled by CBD Secretariat at <http://www.biodiv.org/programmes/socio-eco/benefit>).
- iii. Build capacity of communities to know the full local and national/global value of their resources or knowledge, and to negotiate equitable benefit-sharing in case of transfer deals and contracts (*see Action 1* above; *see also Access and Benefit-sharing BSAP*)
- iv. Facilitate member-governed cooperatives or other collective approaches to enable organised negotiations, enterprise and marketing, with governmental facilitation as necessary, to ensure equity and protection from unfair competition; give priority focus to ensuring that women and other underprivileged sections are empowered to participate.
- v. Integrate into rules under the Biological Diversity Act, 2002 and other appropriate laws such as the Geographical Indications of Goods Act, 1999, the stipulation that any commercial use of traditional knowledge can take place only with the prior informed consent of the knowledge-holders; for this, build on the Prior Informed Consent form that the National Innovations Foundation has developed;
- vi. Develop a tracking system to monitor the wider uses of traditional knowledge, to ensure that uses subsequent to its transfer from the knowledge holder are in consonance with the consent agreement, and that further benefit-sharing is ensured when called for; this tracking system should be linked to the knowledge-holders' and database networking and registration system proposed in *Action 4* above, and the information networking actions suggested in *Section 7.1.1.2* on databases;
- vii. Integrate different situations into this tracking system ranging from as yet undisclosed knowledge, to knowledge whose originators/holders are identifiable, to knowledge that is fully in the public domain and whose originators/holders are not identifiable.

Ongoing Relevant GOI Schemes/Programmes:

- (i) Grant-in-Aid to State Tribal Development Co-operative Corporations and Other Such Organisations, and, (ii) TRIFED, programmes of the Ministry of Tribal Affairs.

7. Develop and Apply a Code of Ethics for Researchers Using Traditional Knowledge

Develop and implement a Code of Ethics containing dos and don'ts for researchers who use traditional knowledge as part of their work. This should apply to students, scientists, and others who are conducting biodiversity-related or other research. In so doing, build on the voluntary code of ethics developed by various institutions including Srishti, and on the GOI circular to all research institutions with regard to the transfer of research results to foreign agencies (O.M.No.1/116/5/98-TS dated 21st December 1999). The code should include elements such as joint authorship with traditional communities or their members in cases where they have provided substantial knowledge and inputs; revisions in Ph D and other dissertation guidelines to allow for such joint authorship; requirement of prior informed consent of the traditional communities or their members whose knowledge is to be used; and full and informed participation of the concerned women and men of such communities in the research programme.

Justification: Most researchers who use traditional knowledge do not apply any system of ethics to their work. This either happens inadvertently, since the issue is not even in the consciousness of researchers, or as a deliberate act of neglect, or sometimes even as willful unethical practice. A strong code of ethics is therefore required, which can be applied voluntarily or through statute.

Suggested Responsibility: MoEF, Ministry of Science and Technology (including Department of Biotechnology), MoA, MoTA (and other ministries/Departments that sponsor research using traditional biodiversity-related knowledge), in association with research institutions and relevant NGOs.

Time Frame: 1 year.

Steps:

- i. MoEF, through one of its existing biodiversity-related research committees (or a new one) to draft the code



- and circulate widely amongst research institutions and organisations, and associations of community organizations (including rural women's organizations) for feedback;
- ii. MoEF to issue a circular directing the implementation of this code to all states and public sector research institutions (including those within central and state jurisdiction) and to all universities, colleges, and private research institutions, and to NGOs;
 - iii. The above committee, or some other body set up for this purpose, to monitor the implementation of this code through decentralised partnerships.

7.1.5.5 Strategy: Ensure Equitable Sharing of Benefits from the Use and Marketing of Community-Managed or Developed Resources

Take steps to ensure that the benefits derived from the wider use and marketing of community-managed or community-developed resources, are shared equitably with them.

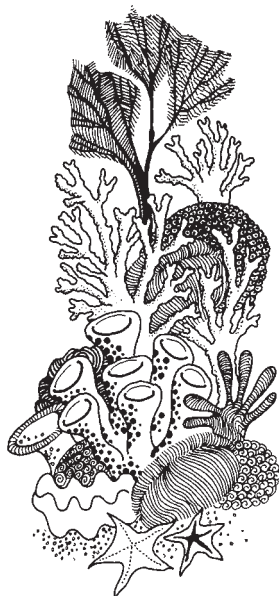
Justification: The wider world (especially urban citizens and consumers in other countries) obtains considerable benefit from using biological resources that have been conserved or developed by local communities. Yet there is very meagre return to the community for such use. More equitable benefit-sharing would help move towards a greater stake in conservation and greater social justice.

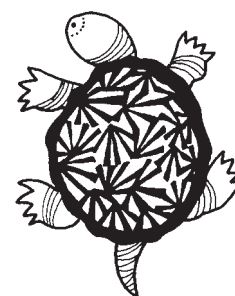
Suggested Responsibility: MoTA, MoEF, MoRD, Ministry of Commerce, and other relevant ministries, and State Forest Department, Revenue Department, Fisheries Department, and other relevant State agencies involving institutions dealing with PRIs such as National Institute of Rural Development, Public Administration Institutes, and others.

Time Frame: 5 to 10 years

Steps :

- i. Document the wider use of biological resources sourced from areas within the jurisdiction of communities; including mapping the extent and route of movement (e.g. mushrooms collected and sold in one area, ending up in distant places for use in medicinal or other products), and the economic differential between first and last sale.
- ii. Ensure equitable benefit-sharing for such wider use of biological resources, on principles of free, prior and informed consent of the concerned communities (*see Box 7.1.5.1*); such arrangements could include fees (as provided for in the Biological Diversity Act, 2002), royalties, non-financial material benefits such as development inputs, social and political benefits, etc. As an example, formulate mechanisms with fisherfolk, for benefit-sharing fishery and non-fishery aquatic resources taken from areas within their traditional jurisdiction. This should include benefits arising from the genetic 'prospecting' and bio-resource utilisation activities that are being extended to marine areas (*Living Marine Bioresources and Biodiversity Sub-thematic Review*); and from the extraction of minerals, petrochemicals, and other produce that causes displacement and dislocation of fisherfolk's livelihoods (*Livelihoods, Lifestyles and Biodiversity BSAP*). It should be noted that such benefit-sharing arrangements should themselves be within the context of the actions to secure traditional fisherfolk's tenurial rights over coastal/marine areas (*see Strategy 7.1.5.1, Action 1*).
- iii. Initiate a system of returns and rewards for the intangible ecosystem benefits provided by biodiversity that communities and/or individuals are conserving; this could be an incentive for communities and individuals not to convert the current land/water use (private forests, sacred grove, common lands and water, etc.), into a form that does not promote conservation; the present dispensation which approves benefit-sharing only for the 'use of accessed biological resources, their by-products, innovations and practices associated with their use' (Biological Diversity Act, 2002) is liable to have an adverse effect on biodiversity, since farmers will not be averse to replacing mixed forests with single species plantations that have high commercial value, or to indiscriminately trading off their land races for a share of the profit under the intellectual property regime. This should be linked to the establishment of information and knowledge networks (as mentioned in *Section 7.1.5.4*).





- iv. Integrate such equitable benefit-sharing into relevant policies and laws (see Section 7.1.8), and facilitate the building of capacity amongst communities to handle benefit-sharing arrangements.
- v. Promote, through appropriate infrastructural and economic support, a bio-resource-based barter or monetary economy in local markets (*haats*), with appropriate checks against over-exploitation of the resources; given that traditional producer-consumer relations and non-monetised exchanges are eroding rapidly, this will require innovative incentives and facilities to encourage the primacy of local markets over long-distance ones (e.g. governmental provision of infrastructural support and publicity to producer-controlled markets, where consumers can establish or continue a direct relationship with producers from among forest-dwellers, fisherfolk, farmers, pastoralists, and artisans).
- vi. Promote, through appropriate support, sustainable and equitable marketing of bio-resources based on the skills and initiatives of local communities; in such markets, enhance the abilities of women and other underprivileged sections to get a fair and even premium deal for their products; facilitate local geographical appellations (through the Geographical Indications Act, 2000) that would even help them derive premium returns, as is the case with a variety of wild and cultivated produce (spices, mango, rice, banana, etc.) in many parts of India;
- vii. Promote, through voluntary and statutory means, responsible marketing practices amongst corporations and others, particularly to ensure equitable relations with local communities; establish guidelines and standards that ensure the lowest possible difference between the price obtained for a product by the collector/local producer, and that obtained by the final seller.

Ongoing Relevant GOI Schemes/Programmes:

- Science and Technology for Women Scheme under Societal Programme, Ministry of Science and Technology
- Sub-Programmes (i) Biotechnology based programmes for Scheduled Caste and Scheduled Tribes, (ii) Biotechnology Based Programme for Women and Rural Development, under the Biotechnology-Based Programmes for Society of the Department of Biotechnology

Box 7.1.5.1 The Right of Free, Prior and Informed Consent of Adivasi/Indigenous Tribal Peoples

Build into relevant laws and policies, including those relating to land acquisition and environmental impact assessment of projects relating to the land/water/resources of *adivasi*/tribal/indigenous people, the local community's right of free, prior and informed consent (FPIC). FPIC implies the following:

1. All members of the community affected by the proposed activity consent to it.
2. Consent is determined in accordance with customary laws and practices, subject to the involvement of affected persons and to basic principles of equity and conservation sustainability.
3. There is clearly established freedom from external manipulation, interference or coercion.
4. There is full disclosure of the intent and scope of the activity proposed.
5. The decision is made in a language understandable to the community.
6. The decision is made through a process comprehensible to the community.
7. There exists a right to say no to, or insist on modifications of, any projects or activity they consider unacceptable, giving due reasons for the rejection or modifications.
8. The right to deny access to knowledge and resources and to maintain secrecy, giving due reasons for the same.
9. The right to ownership or joint and equitable ownership of research data, patents and products derived from the research.
10. The right to have patents derived from their knowledge nullified, if obtained without their consent or in violation of the above conditions.
11. The right to be equal partners in all activity, research, development or conservation initiatives relating to their resources and knowledge.

It is proposed that Article 31 (A) of the Constitution of India, as also all other related laws and policies, be subject to the above principles.

7.1.6 Wild Biodiversity: Strategies and Actions for Building Capacity

(Note: This chapter should be read in conjunction with the *Education, Awareness and Training BSAP*, prepared under the NBSAP. Some relevant Sub-thematic Reviews that should also be referred to are mentioned in the text along with the relevant action point).

Overall Strategies:

1. **Build capacity of public functionaries such as government officials and political leaders, and governance institutions such as Panchayati Raj Institutions and Urban authorities** to deal with biodiversity issues;
2. **Build capacity of other actors, including NGOs, urban residents, workers/labour unions, judiciary, armed forces, police and customs, corporate/business sector, media, scientific community, religious institutions/leaders, etc.,** to deal with biodiversity issues;
3. **Promote 'learning for life', by integrating biodiversity into formal and non-formal education**, including in text books and teaching methods, and through folk media, oral systems and other forms of transmission; encourage traditional modes of learning and education;
4. **Use public spaces for biodiversity awareness**, including biodiversity conservation sites such as protected areas and community-conserved areas, and other public spaces;
5. **Strengthen information dissemination systems**, combining traditional and modern methods, making creative use of mass and folk media, and utilising the opportunities provided by mass transport.

7.1.6.1 Strategy: Build Capacity of Public Functionaries and Governance Institutions to Address Biodiversity Issues

Actions

1. Build Capacity of Officials from All Line Departments

Integrate biodiversity-related courses and material into the training programmes and orientation sessions of government officials from all sectoral departments and agencies; priority should be given to those sectors with significant impacts on, or dealings with, biodiversity, such as forestry/wildlife, fisheries, agriculture, animal husbandry, water resources, revenue and land use, energy, infrastructure, commerce, construction, police, and customs.

Justification: Although some orientation on environmental issues in general and biodiversity issues in particular is given to government officials to some extent, it is far from adequate. This is particularly true not only of sectors that deal with development, administration and welfare programmes, but even with the environmental programmes, where biodiversity integration is weak. Orientation towards inter-sectoral integration is still poor. There is therefore a need to integrate biodiversity into the existing curricula in both the pre-service and in-service training programmes, as also to develop where necessary, new specialised curricula specific to each sector.

Suggested Responsibility: MoEF, MHA, and Department of Personnel and Training (DoPT), through the Lal Bahadur Shastri National Academy of Administration as lead agency, in collaboration with the Indian Institute of Public Administration, state Administrative Training and Public Administration Institutes, ICFRE and related institutions, and other relevant training institutes as well as other ministries like Ministry of Tribal Affairs, and Revenue/Land Use departments.

Time Frame: Curricula to be prepared within one year; training and orientation ongoing.

Steps:

- i. MoEF, MHA and DoPT to set up a joint committee to facilitate development and strengthening of biodiversity-related training curricula and methods. The committee should comprise persons from various national-level education and training institutions (from both the government and non-government sectors) presently conducting training programmes on different aspects of biodiversity. Such institutions could include WII, IGNSA, LBSNAA, IIPA, ASCI, NIRD, CEE, WWF, BVIEER, IIFM, BNHS, Ecological Society, etc. DoPT's existing com-



- mittee to review the public administration syllabus could be expanded or linked to for this purpose.
- ii. The Committee should assess and suggest methods for revamping of existing training courses run by different national-/state-level institutions, for holistic coverage of biodiversity-related issues, including ecological economics and community-based initiatives, knowledge, and learning techniques.
 - iii. The Committee should facilitate the development of a core training module, and help in the pilot testing of the module by running a series of Training of Trainers (TOT) programmes with selected trainers from identified national and State institutions, NGOs and communities (including women and men with specialised indigenous knowledge). The module could thereafter be housed in identified national as well as state institutions and used on a regular basis. Institutions like IGNFA at the national level, and state forest training colleges, could also take a lead in this.
 - iv. The Committee could also help in identifying the types of specific modules for different sectors of government, and identify institutions to develop and run such specific modules.
 - v. Based on the above modules and curricula, national and state training institutes should reassess and revise their curricula to cover the full range of biodiversity issues (NWAP 2001).

Ongoing Relevant GOI Schemes/Programmes:

- The following programmes/components of the MoEF: (i) Forest Survey of India under the Survey of Natural Resources Programme, (ii) Wetland Conservation sub-programme under Conservation of Natural Resources Programme (iii) National Afforestation and Eco-development Board under Regeneration and Development Programme, (iv) Environmental Education, Awareness and Training; Non-formal Environment Education and Awareness; and ENVIS sub-programmes under Education, Training and Information programme.
- National Institute for Research & Training in Tribal Affairs component under Research and Training Scheme, Ministry of Tribal Affairs
- Training, Capacity Building and Awareness Generation Projects, National Bioresources Development Board
- (i) Programme on Human Resource Development under Horticulture, (ii) Training in Plant Protection sub programme under Plant Protection, of the Ministry of Agriculture
- The Training Programmes and Information Services, programme under NBPGR

2. Build Capacity of Political Leaders at State and National Levels

Devise and run special orientation programmes on biodiversity, for politicians at state and national level, in particular MLAs and MPs.

Justification: For most politicians, decision-making does not include biodiversity and related livelihoods as one of the priorities. Understanding of the importance of biodiversity is poor in this sector, which manifests itself in policies, laws, and programmes that are ecologically insensitive. Since political functionaries are not part of any regular training schedule, special programmes and initiatives will need to be taken to sensitise them to biodiversity issues.

Suggested Responsibility: Parliamentary Standing Committee on Environment, Science and Technology, in association with MoEF and MoTA, and with inputs from relevant NGOs and institutions at the central level like TISS, Madras Institute of Development Studies, Institute for Social and Economic Change, IGNFA, WII, IIFM; corresponding bodies (ATIs, forest training institutes, and so on) at state level.

Time Frame: To start within one year, ongoing thereafter.

Steps:

- i. MoEF and collaborating institutions to hold a special session for the Parliamentary Committee, and jointly chalk out a plan of action;
- ii. Develop brief and focused resource material, for widespread dissemination amongst politicians;
- iii. Hold regular orientation sessions for MPs, conducted by relevant national and state level institutions, on various biodiversity issues; in particular, relate these to ongoing political debates and decision-making, such as



- related law-making, policy-framing, decentralised decision-making, human-biodiversity interface, responses to international events, discussions on controversial development projects, 5-year plans, annual budgets, etc.;
- iv. Integrate such resource material and orientation programmes into the National Development Council process, focusing on the Council particularly before key meetings that are to decide on national development matters;
- v. Involve key representatives from communities and people's networks/movements as resource persons in such programmes.

3. Build Capacity of Planners at District, State and National Level

Develop sector-specific training curricula and programmes for biodiversity integration into the planning process at district, state and national levels.

Justification: Increasingly, there is a felt need for cross-sectoral integration of biodiversity at the planning stage, but most planning bodies at district, state, and national levels do not have adequate capacity to carry this out. Hence, there is a need for training and orienting planners on biodiversity issues.

Suggested Responsibility: MoEF with the Planning Commission, and relevant ministries including Rural Development, Tribal Affairs, and Urban Development, in collaboration with State Planning Boards, relevant state departments, ATIs, state public administration institutes, PRI training institutes, LBSNAA, IGNFA, WII, IIFM, and IIPA; with central involvement of community experts and networks/movements, and inputs from relevant NGOs and forums like Centre for Environment Education, Indian Society for Ecological Economics, etc.

Time Frame: 1 year to develop curricula, training ongoing thereafter.

Steps:

- i. Planning Commission to set up a working group with representatives of the above-mentioned and other relevant institutions and NGOs; the working group to prepare curricula and training course material for planners at district, state, and national levels;
- ii. Organise training of trainers sessions, using this curricula and related material;
- iii. Facilitate an ongoing series of training and orientation sessions, handled by these trainers at various levels from district to national.

4. Increase the Capacity of Panchayati Raj and Other Village Institutions to Conserve and Manage Biodiversity

Build the capacity, based on available indigenous knowledge and skills (and supplementing these with appropriate external inputs), of Panchayati Raj and other village institutions to conserve and manage biodiversity. This should include forest protection committees, water management committees, coastal/marine area CBOs, the proposed Biodiversity Management Committees under the Biological Diversity Act, women's committees and self-help groups, etc.

Justification: While there is increasing decentralisation of decision-making on natural resources and other elements of community life (see Sections 6.1.5 and 6.2.5, and also Sections 7.1.5 and 7.2.5), in many cases the institutions thus empowered do not have adequate capacity to conserve and manage biodiversity, and/or achieve equity in its use and benefit-generation. Site-specific, culture- and gender-sensitive programmes to develop this capacity are required, including amongst any specific bodies that may have been created or will be created to manage biodiversity.

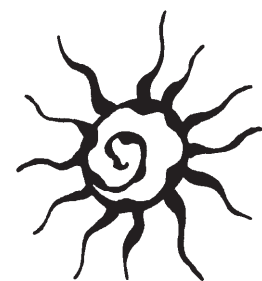
Suggested Responsibility: MoRD, MoEF and other relevant ministries, with the Planning Commission and state planning boards, through *panchayat* training and research institutions including the National Institute of Rural Development, TISS, MIDS, relevant NGOs, and PRIs themselves.

Time Frame: Two years for an initial representative sample; ongoing for the rest thereafter.



Steps:

- i. Identify biodiversity-related courses and training programmes related to PRIs that already exist in different parts of the country, and the major gaps in their regional and thematic coverage;
- ii. Develop training programmes for specific target groups such as PRI functionaries, *Jan Shikshaks*, self-help group animators, frontline functionaries of line agencies, NGO field workers, etc., to validate the training material as well as build capacity of field-based animators; focus especially on building capacity of women and underprivileged castes and classes;
- iii. Develop locale-specific education material at the district level;
- iv. Establish District Biodiversity Centers to assist local bodies, district administration, etc., with authentic data for biodiversity management.

**Ongoing Relevant GOI Schemes/Programmes:**

- MoEF's National Afforestation and Eco-development Board under Regeneration and Development Programme.
- MoRD's (i) Integrated Wastelands Development Programme, and (ii) Technology Development Extension and Training (TDET), Scheme under Other Schemes of Wasteland Development Programme.

5. Increase the Capacity of Urban Authorities and Municipal Ward Committees to Conserve and Manage Biodiversity

(This would involve slight modification of details from *Action 4*, use of the 74th Constitutional Amendment, and focusing on the need for capacity-building to do spatial or landscape/waterscape level planning; see also *Section 7.1.6.6*).

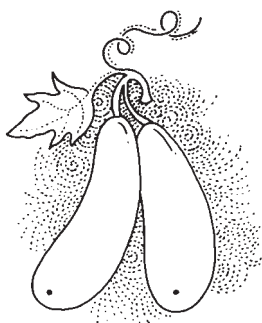
7.1.6.2 Strategy: Strengthen Nature Awareness and Interpretation Facilities at Key Biodiversity Sites**Actions****1. Enhance the Use of Existing Interpretation Facilities and Create New Ones**

Strengthen existing interpretation and awareness facilities in protected areas and other natural sites, and create additional facilities in a representative sample of other areas. This should include protected areas, community-conserved areas other than those within the PA network, and other natural ecosystems and sites including those with surviving traditional management systems. The centres and facilities should cover the full range of biodiversity-related topics relevant to the site, including biological and conservation aspects, socio-cultural, gender, and economic aspects, indigenous knowledge, etc. The facilities should specially cater to 'disabled' and underprivileged sections (*see Box 7.1.6.1*).

Justification: Well-designed nature interpretation facilities can greatly enhance the educational value of a natural site and help in generating greater support for its conservation. While several such facilities do exist in protected areas and elsewhere, they need to be considerably improved and expanded in scope and coverage, especially to cover critical biodiversity issues. Aspects like the links between nature and humans, agro-biodiversity, etc. are usually absent from the existing centres. There are also several other areas within and outside the PA network that can be effectively used to promote nature awareness amongst residents and tourists/pilgrims, including areas conserved by communities, other natural sites, *ex situ* collections like zoos and botanical gardens, and museums.

Suggested Responsibility: MoEF in collaboration with MHRD, State Forest Departments, National Museum of Natural History, National Museum of Man, CZA, BSI and ZSI, relevant NGOs including those like CEE that have already developed such facilities, educational institutions and community representatives.

Time Frame: 3 years for a representative sample, ongoing thereafter in these and other sites.



Steps:

- i. MoEF to assign a reputed environmental education institute to collate a full list of existing interpretation centres and activities in India, and assess their current status in terms of public outreach, materials/activities, gaps in coverage, and resource availability;
- ii. Widely publicise, through ENVIS and other forums, and in local languages, information about existing interpretation facilities;
- iii. Enhance the facilities at these centres, build in greater urban and rural community participation in their running, and integrate aspects that are missing or weak, such as the socio-cultural links with nature and agrobiodiversity;
- iv. Encourage the establishment of more interpretation facilities in a biogeographically representative sample of PAs, community conserved areas, other natural sites, zoos, botanical gardens and museums (including those not devoted to natural history); such facilities should include not only interpretation centres but also active nature trails and education material; at community-managed sites, communities should be supported and facilitated to make and manage the facilities themselves e.g. the *Uttara Kannada Sub-state Site BSAP* suggests setting up of a Museum on Community Fisheries to display all aspects of community fisheries including their knowledge about the marine biodiversity and bioresources;
- v. Facilitate a process of exchanges amongst the officials, communities, NGOs, and institutions that are managing the interpretation facilities in different parts of India.

Ongoing Relevant GOI Schemes/Programmes:

- Establishment of *Vanaspati Vanas* Scheme, Department of Indian System of Medicine and Homeopathy.
- MoEF's various programmes, including (i) Assistance to Botanical Gardens Scheme, (ii) Grants-in-Aid to Professional Societies Scheme, (iii) Development of National Parks and Sanctuaries under the Conservation of Natural Resources Programme.

2. Develop Site-Specific Awareness Material for Diverse Sectors, and Enhance Usage of Existing Material

Develop a range of materials for use in awareness and education programmes, specific to each site and region, and enhance the use of such material as already exists. The material should include field guides, manuals, interactive kits, etc., on a range of biodiversity-related topics. The use of existing material of this nature, produced by government and non-government agencies, should be enhanced.

Justification: While there already exists a considerable amount of educational material on nature in India, a lot of this material does not effectively reach the groups it should, and also contains significant gaps in regional and thematic coverage. Quite a bit of the material is also very general, and hence difficult to apply to site-specific situations. Effective site-specific material aimed at different sectors, including both resident populations and visitors, needs to be produced and disseminated, even while increasing the usage of existing material.

Suggested Responsibility: Identified state-level institutions, NGOs, and communities, with help from CEE and CPR Environment Education Center, MoEF and MHRD.

Time Frame: 3 years for a representative sample; ongoing after that.

Steps:

- i. Collate information on existing educational material on biodiversity, building on lists/documentation already available with the groups mentioned above; assess key gaps in coverage;
- ii. Recognise active state-level institutions (government or non-government) as nodal units for environment education and awareness for each state, by the Government of India in consultation with the state government; these units should actively network with the national-level institutions to develop appropriate resource material;
- iii. Commission reputed and knowledgeable groups and individuals to develop material relevant to each of the sample sites chosen in *Action 1* of this section, and on the key gaps identified above, as far as possible in local languages;
- iv. Disseminate the material through all possible networks.

Ongoing Relevant GOI Schemes/Programmes:

- Ministry of Human Resource Development (MHRD): (i) National Bal Bhawan, an organization under MHRD, (ii) Environmental Orientation to School Education, of the Department of Elementary Education and Literacy under MHRD.
- MoEF: (i) National Environment Awareness Campaign, (ii) Launching Of Mass Awareness Campaign under Non-Formal Environment Education And Awareness (iii) ENVIS programme, (iv) Financial Assistance for Publications under Education, Training and Information programme

7.1.6.3 Strategy: Strengthen Capacity of NGOs**Actions****1. Orient NGOs to Ecological and Social Aspects of Both Wild and Domesticated Biodiversity**

Hold orientation programmes for NGOs of various kinds (not only those already dealing with biodiversity), to sensitise them on biodiversity issues, including the various aspects dealt with in this action plan.

Justification: NGOs working in the fields of development and welfare are often ignorant about or unconcerned about ecological issues; in turn, many conservation NGOs are unaware or unconcerned about issues of biodiversity-based livelihoods, indigenous knowledge and power-sharing. There is a need for more dialogues and exchanges between them, and for continuously raising awareness of biodiversity-related aspects.

Suggested Responsibility: Conservation education NGOs like WWF and CEE, public administration institutes at the centre and the states, and institutes like ICFRE, TISS, MIDS and ISEC.

Time Frame: Ongoing

Steps:

- Identify institutions/NGOs that can take up this task, in each region or if possible each state/UT; for this, build on the existing networks of MoEF partners in programmes like the National Environment Action Programme and the NBSAP; provide maximum space to institutions/NGOs that may be recommended to take up tasks on their own and with their own materials/ideas;
- Organize one or more initial training workshop for these institutions/NGOs to discuss common strategies; ensure that these training programmes are at the state/district level to enable site-specific issues to be covered;
- Hold regular (once in 6 months to a year) orientation sessions for the identified NGOs.

**Ongoing Relevant GOI Schemes/Programmes:**

- Environmental Education, Awareness and Training under Education, Training and Information programme, MOEF.
- Environmental Orientation to School Education scheme, of MHRD.

7.1.6.4 Strategy: Integrate Biodiversity into the Formal Education System and Convert It into 'Learning for Life'**Actions****1. Enhance Biodiversity-Related Education in the Formal School System**

Integrate, throughout the school-based education system, biodiversity issues as relevant for each level and subject; make the system flexible and site-specific to cater to the diverse needs and contexts of different regions and cultures.

Justification: Though the environmental content in school education has risen in India, the full range of biodiversity issues is still missing; moreover, there is little integration of these issues into subjects other than environment. To understand and appreciate the value of biodiversity, it is important that education related to this is imparted from school itself, and that this is done as part of all subjects and at all levels. Moreover, since ecological and cultural contexts are very different in different parts of the country, a single model of education with homogenised curricula and teaching methods is most inappropriate; there is a need for flexibility built into the system to encourage its regionalisation and cultural sensitisation.

Suggested Responsibility: NCERT in collaboration with MoEF, MHRD, CEE, and the state Departments of Education, with inputs from biodiversity experts and teaching institutions such as TISS, Eklavya and BVIEER.

Time Frame: 5 years

Steps:

- i. Widely share the lessons and learnings emerging from the BVIEER project on Environment Education in School System (EESS) under Phase I of the India Environment Management and Capacity Building (IEMCB) project, with a view to strengthen biodiversity education nationally (*Education, Awareness and Training Thematic BSAP*);
- ii. Document traditional community (including oral) means of learning; use the learning therefrom, and the help of appropriate rural resource persons, to bring in such methods into the formal education system;
- iii. NCERT to formulate and issue guidelines, following up on steps (i) and (ii) above, on how biodiversity integration into the formal curricula can take place, while retaining flexibility to allow for site- and culture-specificity;
- iv. State Education Departments to integrate EESS learnings into curricula and textbooks to be developed in the state, allowing for flexibility that enables and facilitates the incorporation of locality-specific elements into the curricula and texts;
- v. Lessons from other ongoing schemes to be documented and disseminated, including those described in *Section 6.1.6.2*, and others such as Madhya Pradesh's experience of 'Apna School' (*Education, Awareness and Training Thematic BSAP*) under the Rajeev Gandhi Shiksha Mission (wherein biodiversity education has been integrated in 10 Shiksha Mission Schools), and the Education Guarantee Scheme being implemented in several states;
- vi. Upgrade existing curricula for teachers in line with the EESS experience and the larger school based EE experience in the country;
- vii. Conduct orientation workshops for textbook writers and producers;
- viii. Develop locale-specific and community-specific educational material such as activity books for teachers and children, to supplement the formal curricula and textbooks (learning from examples such as the teachers' manual for Andaman & Nicobar Islands, and Lakshadweep by Kalpavriksh); encourage field visits by students to sites of biodiversity importance (including agro-biodiversity); cater especially to 'disabled' and underprivileged sections (*see Box 7.1.6.1*);
- ix. Mobilise fiscal resources through Environmental Orientation to School Education (EOSE) scheme of MHRD and UNICEF.

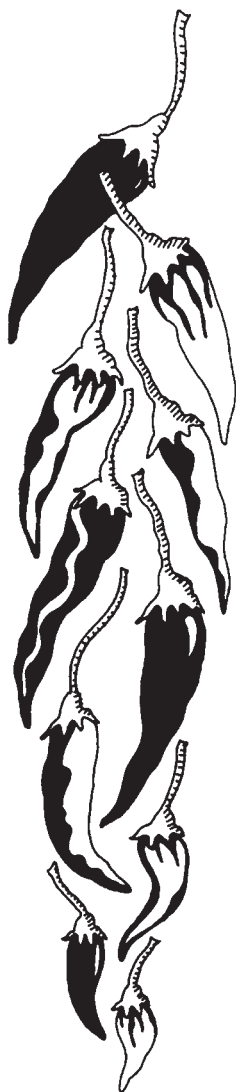
Ongoing Relevant GOI Schemes/Programmes:

- Environmental Education, Awareness and Training under the Education, Training and Information programme of MoEF;
- Environmental Orientation to School Education Scheme, of MHRD.

2. Enhance Biodiversity-Related Education in the Formal College System

Integrate biodiversity into various subjects at the college/university level, and introduce specialised multi-disciplinary courses on biodiversity.

Justification: The introduction of biodiversity-related issues at the school level should be followed with more advanced learning of issues at the college level. At this level, there is an almost total disjunction between environment and other subjects, which leads to a general lack of sensitivity and information amongst students other



than those doing environment-related subjects. It is at this level that students opt for careers and it is possible that awareness of biodiversity issues may make students more inclined to choosing careers relevant to biodiversity, or be more sensitive about such issues in whatever other profession they choose.

Suggested Responsibility: UGC, in collaboration with MoEF and MHRD, with relevant site-specific and thematic institutions and NGOs at state level.

Time Frame: 5 years

Steps:

- i. UGC to commission an assessment of the current state of biodiversity-related education at college/university level, and a detailed set of recommendations on how to infuse biodiversity throughout university teaching;
- ii. UGC to follow up with all universities to seek compliance with the Supreme Court ruling of 1991 encouraging all colleges to introduce undergraduate course on environment, and to encourage and support the creation of inter-disciplinary courses on biodiversity. Such courses should be open to students of all disciplines, not only to those from the natural science stream; they should also be open as parallel or supplementary subjects to students studying other subjects;
- iii. UGC to set up a committee or group to consider a compulsory or optional environmental paper/examination for college students, with a major stress on biodiversity;
- iv. Universities to introduce field-based dissertation work on biodiversity-related issues and/or placement with relevant community institutions or NGOs, at the undergraduate and postgraduate levels for Life Sciences, Environmental Sciences, Economics and Social Sciences, with credits for the same;
- v. Relevant curricula for college students focusing on biodiversity-related issues to be developed. Learnings from initiatives such as Project Lifescape of the Indian Academy of Science; Species Assessment Project of RANWA, Pune; Environmental Quality Monitoring Programme of CEE South; field studies and dissertations related to biodiversity monitoring and use for M. Sc. (Environmental Science) students by Bharati Vidyapeeth Institute of Environment Education and Research (BVIEER), Pune; and other such initiatives engaging college students in biodiversity-related field work can be use for developing such material;
- vi. Colleges and universities to be encouraged and supported to bring in resource persons from diverse fields and backgrounds, including from local communities that are doing innovative work on biodiversity, in order to expose students to a wide array of skills and knowledge and to bridge the gap between urban and rural learning;
- vii. UGC to take up teacher training in biodiversity education at college level, by identifying lead agencies including those that are community-based, to facilitate development of training modules and learning resources.



Ongoing Relevant GOI Schemes/Programmes:

- Environmental Education, Awareness and Training under Education, Training and Information programme, MoEF;
- Innovative Programme, and Academic Staff Colleges Including Staff Development programme, of University Grants Commission, Ministry of Human Resource Development

3. Integrate Biodiversity into Existing Vocational Courses, Introduce Biodiversity-Related Vocational Courses, and Link Biodiversity Education with Relevant Jobs

Introduce elements of biodiversity and related livelihoods into different ongoing vocational courses; in addition, introduce appropriate vocational courses that promote biodiversity-based livelihoods. These should include vocations based on or related to, non-timber forest produce, medicinal plants, and wildlife conservation and research, including para-taxonomy, aquatic resource uses, agro-biodiversity-based products, etc. These would also need to be linked to equitable livelihood opportunities, including those recommended in *Sections 7.1.4, 7.1.5, 7.2.4 and 7.2.5.*

Justification: Most existing vocational courses and training programmes do not integrate environmental and biodiversity concerns, thereby continuing the alienation of those going into specific jobs. Infusion of biodiversi-

ty elements into these programmes would make people more sensitive to such considerations in their work environments and tasks. There are also few opportunities for vocational studies that promote biodiversity-based livelihood options; so, even when young people want to take up jobs that bring them closer to nature yet earn them a decent livelihood, they do not have many such avenues. A range of such vocational courses and training programmes is therefore needed. Finally, even where there are specialised environmental courses, there are no guaranteed job opportunities for them, which often results in disillusionment.

Suggested Responsibility: MHRD and MoEF, along with relevant institutions such as ITIs and polytechnics, vocational training institutes, architecture, medicine, engineering and forestry institutes, and NGOs working on such vocations, with inputs from biodiversity experts.

Time Frame: Integration into existing vocational courses within 5 years; new courses in at least 3-4 institutions in each state, within the next 10 years.

Steps:

- i. MHRD and MoEF to commission an appropriate institution or experts to Identify ways of integrating biodiversity into existing vocational courses, and enable the vocational institutions to carry out such integration;
- ii. Identify existing vocational courses relating to biodiversity and biological resources, strengthen them through appropriate resource support, and document their experiences for wider use;
- iii. Set up institutional facilities for bioresource-based vocational training, starting with at least 3-4 such centres in each state and going on to at least one in each *taluka*; ensure that these are based on locally available bioresources, and are to the extent possible built on existing traditional or local skills, knowledge and vocations;
- iv. Establish links between such vocational studies and job prospects, including with appropriate NGOs, government agencies, etc.; facilitate a nation-wide environmental education-to-job network.

4. Develop Specialised Educational Inputs for Ecosystem and Biodiversity-Based Communities

Develop special curricula, textbooks, and teaching methodologies for regions inhabited by *adivasis*, fisherfolk, pastoralists and farming communities, integrating biodiversity and cultural issues specific to these regions and communities, and maximising the use of local languages (including dialects and tribal languages). Such development should take place with the active involvement of specified communities, and should integrate both conceptual and vocational aspects.

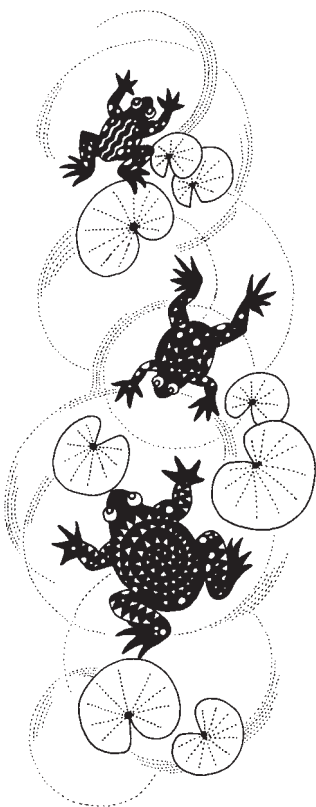
Justification: Standardised, national or even state-level curricula, textbooks and teaching methods are insensitive to the specific and special ecological and cultural contexts of students from communities that are dependent on biological resources for their livelihoods. As a consequence, such education tends to alienate young people from their own communities and environments, and in many cases even make them scornful or disrespectful of their own traditions. There is therefore an urgent need to revamp the education system and inputs in such areas, and this can only be done with the actual involvement of local communities.

Suggested Responsibility: NCERT, in association with State Education Departments, and guided by relevant community institutions and NGOs working with these communities.

Time Frame: Revision of existing curricula etc. within 3 years; development of new curricula etc. within 5 years.

Steps:

- i. NCERT, along with relevant experts, to review current curricula and teaching methods for each such 'marginal' area, and identify in each case the gaps and likely resolutions;
- ii. Local community organisations and/or local NGOs to be assigned the task of either re-orienting existing curricula and material to suit the local ecological and cultural context, or of developing new curricula and material of this nature (as has been done by institutions like Eklavya for Central India and SECMOL for Ladakh);
- iii. SCERTs to facilitate the above process, and make available the resources that would be needed for the successful completion of the above two tasks.



5. Integrate Biodiversity into Adult and Continuing Education Programmes

(See also *Action 4* above.)

Justification: The National Literacy Mission (NLM) has a good network of State Resource Centres and NGOs working for adult and continuing education. The goals of functional literacy include participation in the development process and imbibing values of ecological conservation. The NLM seeks to achieve these objectives through provision of relevant teaching/learning materials and facilitating teaching/learning through training, media and communication, and by developing the quality of human resources at all levels of functionaries through orientation and training. Biodiversity issues, however, are not yet fully integrated into these programmes.

Suggested Responsibility: Department of Education, MHRD, in particular through the National Literacy Mission, State Literacy Missions, State Resource Centres, University Departments of Adult Education, NGOs working on adult education in collaboration with those working on biodiversity, knowledgeable community members, and community movements/networks working on education.

Time Frame: 2 years

Steps:

- i. Assess existing teaching/learning material and methodologies used in literacy and adult education programmes for appropriateness to biodiversity issues, including their stress on ecological security and their links with livelihoods and culture;
- ii. Develop sourcebooks on biodiversity-related information for use of state resource centers, and facilitate NGOs and community groups to develop their own locale-specific material. Such material should include content on local biodiversity issues facing the people, linking these to the national and global context;
- iii. Document, develop and widely disseminate traditional knowledge of biodiversity, through the medium of adult education and literacy. This must be done by/with local people, not just by outsiders, and should include information, knowledge and understanding of biodiversity under the jurisdiction of rural communities, and how it is affected by various factors. Link this to the development of traditional knowledge registers (see *Strategies 7.1.5.7 and 7.2.6.2*);
- iv. Develop and deliver training courses on biodiversity, for functionaries in the adult education programme; such courses should have biodiversity experts, including from communities, as resource persons.



Ongoing Relevant GOI Schemes/Programmes:

- MoEF's National Environment Awareness Campaign and National Green Corps under Education, Training and Information Programme.

Box 7.1.6.1 Advocating Inclusion for the 'Disabled'

Active participation in the community (or inclusion) is indeed the biggest challenge before people with disabilities today. Society is almost completely designed for able-bodied living, and such an environment becomes 'disabling' for people who have an impairment. 'Disability' is a problem that is located outside of the person with disability. It is caused by the fact that society's structures, systems, physical environments etc. are so designed that they segregate and exclude. A person who cannot walk has an impairment, but lack of mobility is a disability, a situation which is socially created and could be solved by ramps and lifts in buildings, wide entrances and doors, affordable wheelchairs etc.

As an integral part of society, people with disabilities in India must be made aware of their responsibilities towards conservation. They too must be seen as consumers of natural resources, who have as much of an impact on the environment as the

able-bodied. It is important for people with disabilities to be able to have an opportunity to contribute to their neighbourhood or community, as well as partake in environmental education opportunities (see *Box 6.52*). For this, the hurdles faced are those of access (physical, attitudinal, educational), and broad strategies should attempt to increase awareness and sensitization towards the special needs of such groups, develop appropriate educational resource material, and include such groups in ongoing schemes/initiatives.

Desired Actions

1. Enhance the scope of the National Green Corps, to include schools for disabled children, and include special educators in the capacity-building programmes. At least a few schools from each district need to be included (link to *Section 7.1.6.5, Action 1*).
2. Enhance participation in the National Environmental Awareness Campaign of organisations working in the field of disabilities, by introducing a policy change in MoEF to involve such groups (link to *Section 7.1.6.5, Action 1*).
3. Develop and disseminate a set of basic educational resources on environmental issues that cater to the learning needs of the disabled (link to *Section 7.1.6.2 Action 2*; to *Section 7.1.6.4 Action 4*; to *Section 7.1.6.6, Action 3*).
4. Foster linkages to ongoing programmes/ schemes at the local level between NGOs and citizens groups (link to *Section 7.1.6.6, Action 2*).
5. Allow for access to facilities that enhance nature awareness by removing all barriers in existing ones or making them barrier-free when creating them (e.g. in museums of natural history, zoos, etc.) (link to *Section 7.1.6.2, Action 1*).

Source: Environment Education and People with Disabilities Sub-thematic Review

7.1.6.5 Strategy: Strengthen Non-Formal Education on Biodiversity, Including Through Folk Media

Actions

1. Maximise Opportunities for Non-Formal Education on Biodiversity

Create and strengthen programmes of non-formal education relating to biodiversity for school and college students, as well as for other sectors. In so doing, use the vast range of such programmes that are already in place in various parts of India; use also the traditional oral and practical methods of teaching and learning that are still prevalent amongst some communities. Focus in particular of 'disabled' and underprivileged sections, as an integral part of society.

Justification: Current systems of formal education are, and will probably for some time to come remain, somewhat rigid and too examination-oriented. Even while changes including those suggested in *Strategy 7.1.6.4* above are made, it is vital that effective non-formal methods be used to spread biodiversity awareness. Such methods are often more long-lasting in their impacts.

Suggested Responsibility: MoEF and MHRD and State Education Departments, through relevant NGOs and academic institutions, Nehru Yuvak Kendra, NSS, Nehru Youth Clubs, NCC, and other such networks.

Time Frame: 1-2 years

Steps:

- i. Strengthen infusion of biodiversity into ongoing schemes that promote school extra-curricular activities, under the National Green Corps (NGC), Environmental Orientation to School Education (EOSE), and National Environmental Awareness Campaigns (NEAC), and parallel state-level schemes of this kind, if any; provide further support to such activities;
- ii. Document and disseminate successful initiatives at non-formal biodiversity education around the country, including those described in *Sections 6.1.6 and 6.2.6*, and in the *Education, Awareness, and Training Thematic BSAP*;

- iii. Enhance non-formal education in academic institutions, and for rural and urban youth in general, by reinforcing or creating linkages with Forest or Wildlife Departments, Agriculture and Fisheries Departments, coastal management authorities, etc., conservation and social action NGOs, and local community or urban locality institutions; this should be done with a view to maximize learning opportunities through visits to natural sites, protected areas and community conserved areas, areas where interesting innovations relating to biodiversity are taking place, etc.;
- iv. Integrate biodiversity into the activities of student-level networks and movements, such as NCC, NSS, Nehru Youth Clubs, and so on;
- v. Publicise and support the spread of a wide range of non-formal methods, including the methods traditionally used by local communities;
- vi. Prepare and disseminate biodiversity kits for different kinds of users and situations;
- vii. As part of all the above, provide a focus on 'disabled' and underprivileged sections (see Box 7.1.6.1).

Ongoing Relevant GOI Schemes/Programmes:

- MoEF: (i) Non-formal Environment Education and Awareness, (ii) National Green Corps (Eco-clubs), (iii) Launching of Mass Awareness Campaign under Education, Training and Information.
- Environmental Orientation to School Education Scheme, Department of Elementary Education and Literacy

2. Maximise the Use of Traditional and Folk Media

Spread the use of folk media and other traditional means of creating awareness; infuse the formal systems with such media. These should include the culture-specific versions of street theatre, musical drama, music, dance, art forms, and learning-while-working. As far as possible and appropriate, rural practitioners of such media should be brought in as resource persons for these programmes.

Justification: Many traditional and folk media forms are extremely powerful and have long-lasting impact. Yet they are rarely used in formal education systems or even in non-formal education programmes.

Suggested Responsibility: Ministry of Culture, with MoEF, relevant state departments of culture, guided by institutions, NGOs, National Foundation of Arts, folk troupes and other community institutions that have been using and nurturing such folk media and traditional communication techniques.

Time Frame: Ongoing

Steps:

- i. Document and publicise innovative traditional and folk media that are being used or could be used in biodiversity capacity-building programmes;
- ii. Provide support and facilities to such media, for further spread;
- iii. Provide legitimate space for such media within formal institutions, including media training and research institutes;
- iv. Institute awards and other social incentives for innovative uses of such media to further biodiversity education and awareness.

3. Build Capacity of Communities to Handle New Media Technologies, and Control Local Media Networks

Build the capacity of local communities, and in particular women and underprivileged sections within them, to handle a range of new technologies (including audio, video, and electronic media), and to develop and control local media networks like community radio and cable television.

Justification: The mass media is often insensitive to local community issues, and people are often helpless to influence it. Simultaneously, powerful new technologies for communication and media are monopolised by those who are already socially and economically powerful, thereby leading to even greater disparities. It is there-



fore important for communities not only to assert the power of their own folk communication and media, but also to learn the new technologies as they consider appropriate, and to exercise some degree of control over the messages being sent out through print and electronic media.

Suggested Responsibility: Media groups and NGOs like Other Media Communications, Magic Lantern, Centre for Development Communication, Films for Education, Environment and Development, Pedestrian Pictures, Earthcare Films, Madhyam Communications, Moving Images, CENDIT, SEWA, Media Storm, Sarai, etc., with assistance from Ministry of Telecommunications and Ministry of Information and Broadcasting and involvement of private radio and TV channels and cable operators.

Time Frame: 5 years for a representative sample of sites; 10 to 15 years for the remaining areas

Steps:

- i. Facilitate community-produced, local language newspapers or journals focusing on environmental/biodiversity issues;
- ii. Create space in mass media of various kinds, for communities to present their stories and perspectives, including by providing slots for community-produced articles in newspapers/magazines, broadcasts on private and public radio, and telecasts on private and public TV channels and cable networks;
- iii. Provide legal authority to community radio and video channels, extending the recent approval by Ministry of Information and Broadcasting for setting-up of small FM Radio Stations by educational institutions.

Ongoing Relevant GOI Schemes/Programmes:

- MoEF's (i) Non-Formal Environment Education and Awareness, (ii) National Green Corps (Eco-Clubs), (iii) Launching of Mass Awareness Campaign under Environmental Education, Awareness and Training Programme
- Ministry of I&B's community radio scheme (currently meant only for educational institutions)

7.1.6.6 Strategy: Spread Biodiversity Awareness Amongst Urban Residents

(see also Section 7.1.2.5)

Actions

1. Enhance the Educational Role of Municipal Authorities and Urban NGOs

[adapted from *Education, Awareness, and Training BSAP*; see also Section 7.1.6.1, Actions 4 and 5]

Strengthen the capacity of municipal authorities and urban NGOs to impart biodiversity education and awareness to urban audiences. This should be through appropriate funding and material support, provision of official facilities, integration into municipal policies and programmes, and other kinds of support.

Justification: Biodiversity conservation in urban areas and awareness of biodiversity issues amongst urbanites are generally weak. A part of the reason for this is that municipal authorities and urban NGOs themselves often lack capacity to spread awareness of these issues. It is therefore necessary to build the capacity of municipal authorities and NGOs on how best to address biodiversity concerns, and how to spread awareness about these.

Suggested Responsibility: MHRD, MoEF, and Ministry of Urban Development, through institutions like National Institute of Urban Affairs, and the National Centre for Human Settlements and Environment, in close liaison with municipal corporation/councils, NGOs such as BNHS, CEE, and WWF-I, and urban ward committees and residents' associations.

Time Frame: 3 years



Steps:

- i. Organise orientation programmes for municipal staff to ensure their cooperation and support for creating biodiversity awareness amongst urban people;
- ii. Encourage NGOs working in this sector to compile and disseminate best practice case studies related to urban lifestyles and consumption issues, including waste management, water conservation, greening urban spaces, eco-restoration of biodiversity-rich habitats in and around urban areas, etc.;
- iii. Encourage and support NGOs, and institutions like BSI and ZSI, to inventorise urban habitats that are significant from the biodiversity point of view, as far as possible in collaboration with municipal authorities; for this, learn from the initiatives of groups like RANWA in building a biodiversity profile for Pune, ZSI and Kalpavriksh for Delhi, etc. (see Box 6.21);
- iv. Empower and enable public awareness cells within the municipal corporations and councils to develop, adapt for local use and widely disseminate biodiversity-related education/communication material.

Ongoing Relevant GOI Schemes/Programmes:

(i) Non-Formal Environment Education and Awareness, (ii) National Green Corps (Eco-Clubs), (iii) Launching of Mass Awareness Campaign under Environmental Education, Awareness and Training Programme of the Ministry of Environment and Forests.

2. Enhance the Networking and Functioning of Urban Nature Clubs

Strengthen the ongoing school and college nature club networks, support the spread of such clubs to other schools and colleges or towns where currently non-existent, and help increase the scope of their activities to include various biodiversity-related issues.

Justification: Nature Clubs within urban schools have for many years proved to be an important vehicle for environmental education and awareness. WWF-India has for many years been supporting these clubs in urban schools. The Gujarat Forest Department runs a network of clubs across the state. Recently, under the National Green Corps programme of the Government of India, eco-clubs have been set up by state governments. All these clubs need to be sustained and supported to promote biodiversity conservation within urban areas; where such clubs do not currently exist, efforts are needed to help set them up.

Suggested Responsibility: Environment and Forest Departments of State Governments, municipal authorities, NGOs such as WWF-India, CEE, BNHS, etc.

Time Frame: Ongoing

Steps:

- i. Facilitate linkages between NGOs such as WWF-India, CEE and BNHS, which are already involved in urban nature education work, and relevant government agencies; one aim of this linkage would be to provide continuous technical support to nature/eco-clubs;
- ii. Collect existing resource material relevant to various parts of the country, and encourage their further reproduction, adaptation, and modification to suit other regions and sites;
- iii. Ensure appropriate financial support to sustain these activities.

Ongoing Relevant GOI Schemes/Programmes:

MoEF's programme, National Green Corps (Eco-clubs) under Environmental Education, Awareness and Training Programme

3. Use Creative Methods to Spread Biodiversity Awareness Amongst Urban Populations, Especially of the Impacts of Their Consumerism

Use a range of innovative measures including 'ecological footprint' mapping to create greater awareness regarding biodiversity issues amongst urban residents. In particular, increase awareness and concern about the impacts that urban consumerist lifestyles have on biodiversity and the environment and on rural community livelihoods.



Justification: Urban populations in India are amongst the most ecologically ignorant, and are largely alienated from nature. They are often unaware of their own dependence on biodiversity, of the benefits and services provided to them by natural ecosystems, and of the impacts that their actions could have on ecosystems and communities in the hinterland or further away. It thus becomes important to use creative means to make them more aware and concerned, as a basis for positive action.

Suggested Responsibility: Municipal Corporations, NGOs, and MoEF in collaboration with the Ministry of Urban Affairs, Ministry of Surface Transport, and Ministry of Power, the Directorate of Audio-Visual Publicity, ward committees or residents' associations, and other relevant institutions and NGOs working on urban environmental issues.

Time Frame: 2 years to develop urban- and region-specific awareness material; programmes ongoing

Steps:

- i. Develop special material linking urban lifestyles to biodiversity loss or conservation, and use this in widespread programmes to sensitise urbanites about the impact of their lifestyles. Amongst these should be the concept of 'urban ecological footprint', which shows the nature, quantum, and distribution of the impacts that each urban area has; while one framework model of such material could be developed centrally, its adoption and modification to the specific contexts of each city should be encouraged;
- ii. Promote urban consumer awareness, through means such as labeling of biodiversity-based and eco-friendly products, warning labels on ecologically destructive and products hazardous to health, public service messages relating to biodiversity on radio, television, and public transport, etc.;
- iii. Organize events such as nature *bazaars* and biodiversity festivals (see Box 6.77), which would include the display and sale of natural/organic foods, herbal products and bioresource-based handicrafts, the dissemination of popular literature on various facets of biodiversity, cultural events relating to biodiversity, and other such functions.

Ongoing Relevant GOI Schemes/Programmes:

MoEF: (i) Non-Formal Environment Education and Awareness, (ii) National Green Corps (Eco-Clubs), (iii) Launching of Mass Awareness Campaign under Environmental Education, Awareness and Training Programme

7.1.6.7 Strategy: Build Capacity of Scientists and Other Academics

Orient and build the capacity of formal sector scientists and other academics, not only those dealing with biodiversity but also other subjects that have a bearing on biodiversity. The capacity to work with communities, and across disciplinary divides, is especially important.

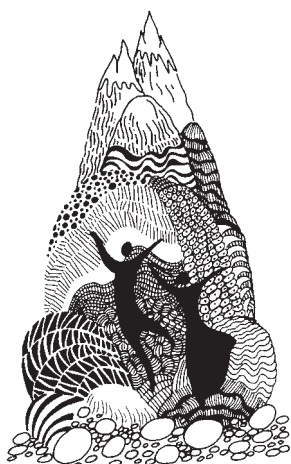
Justification: While scientists and academics are often the repositories of considerable biodiversity knowledge and expertise, there remain serious weaknesses in orientation and awareness even amongst them. This is especially true of socio-cultural and economic issues amongst biological scientists and field workers, or of ecological issues amongst social scientists. Capacity needs to be built across all these academic sectors.

Suggested Responsibility: National level forums such as Indian National Science Academy and associations of social scientists, with help from UGC, MoEF, and other relevant government agencies.

Time Frame: Ongoing

Steps:

- i. Assess ongoing initiatives at orienting scientists and other academics towards biodiversity, identify key gaps, and delineate actions needed to plug these;
- ii. Prepare relevant material;



- iii. Take up a regular series of training and awareness programmes in relevant institutions, and through field visits for mutual learning with communities;
- iv. Facilitate exchanges between biological and social sciences, including through the workshops suggested above.



7.1.6.8 Strategy: Build Capacity of Workers and Labour Unions

Actions

1. Organise Orientation and Training Sessions for Workers and Worker Unions

Create and conduct awareness programmes amongst workers/labour and their unions, to enable them to assess the biodiversity impact of their work, their working environment, various equity issues, and aspects of macro-economic and globalisation strategies relevant to them that impinge on biodiversity.

Justification: While worker unions are getting more organised, there are still crucial gaps in their orientation and information base with respect to biodiversity is concerned.

Suggested Responsibility: Workers' unions and associations, and the management/authorities at the workplace, with support and guidance from relevant NGOs as also government agencies including the Factories Inspectorates and the Pollution Control Boards. The workers' unions and associations should include not only the conventional ones in the industrial and agricultural sector, but also networks such as the National Forum for Forest Workers and Forest People and the National Fishworkers' Forum.

Time Frame: Ongoing

Steps:

- i. Workers' unions and associations, along with NGOs and government agencies, to discuss options for workers' orientation on biodiversity issues;
- ii. Relevant material in local languages to be produced, and orientation sessions to be organised, by groups identified through such a process.

7.1.6.9 Strategy: Build Capacity of The Judiciary and Legal Functionaries

Actions

1. Increase the Capacity of the Judiciary and Legal Functionaries to Deal with Biodiversity-Related and Environmental Justice Issues

Integrate biodiversity issues into legal training and orientation courses, and initiate a system of orientation sessions for members of the judiciary while in service.

Justification: Though environmental jurisprudence and litigation is very active in India, there remains a considerable lack of biodiversity sensitivity amongst the judiciary and legal fraternity. This severely hampers the administration of justice in ecological matters, very often leaves violations unpunished or only mildly punished, and at times leads to judgements that are insensitive to ecological imperatives or to the livelihood and resource rights of biodiversity-dependent communities. Orientation of judges and lawyers is required to assist in effective implementation of environmental legislation, providing expert legal advice to victims of environmental destruction, expediting conflict resolution, and arriving at enlightened judgements.

Suggested Responsibility: Ministry of Law and Justice, through the National Law School of India University (NLSIU), WWF-I's Center for Environment Law, Indian Law Institute, National Judicial Academy, Bhopal, National University of Juridical Sciences, Kolkata, state level judicial academies and other law schools, as well as NGOs like CPREEC and Environmental Services Group.

Time Frame: 2 years in the key institutions; ongoing thereafter

Steps:

- i. Assess the training curricula for all law schools, and reorient it to include biodiversity concerns;
- ii. Compile a directory of environmental law experts, who are sensitive to biodiversity and related livelihood issues;
- iii. Build a roster of such experts to advise the courts on environmental cases;
- iv. Compile cases pertinent to environment law and disseminate this compilation widely among potential users;
- v. Create, at the level of each state, an independent and autonomous environmental law institute;
- vi. Institute a regular programme of in-service exposure for the judiciary on biodiversity issues, through existing and proposed law institutes;
- vii. For all these, build on the work already being carried out by formal training institutes, NGOs, etc.

2. Set Up a Biodiversity and Environment Law Resource Centre at the Supreme Court, High Courts, and District Courts

Create Biodiversity and Environment Law Resource Centres, at the level of District, High and Supreme Courts. Such Centres would, as a part of, or in collaboration with the court libraries where relevant, provide the following services:

- a. Collect material pertaining to the description and analysis of environment and biodiversity-related policy and legislation (including the interface between environmental and human/tribal rights and decentralisation laws/policies), and make this information available to judges as well as members of the legal community;
- b. Provide and constantly update information on the diversity of perspectives related to biodiversity-related issues, and thus act as a link between the legal community and relevant ground issues. This would be done through making available information in the form of written publications and articles/columns in law periodicals as well as the electronic media, and through seminars.

Justification: Courts and lawyers often find it difficult to access specialized material on biodiversity (and other environmental issues). Such a dedicated center would help fill this gap.

Suggested Responsibility: Ministry of Law and Justice in consultation with the relevant courts.

Time frame: 3 years

3. Introduce the System of Law Clerks for Judges of the Supreme Court and High Court

Appoint Law Clerks for judges at the Supreme and High Courts, to assist them in research. This should be in place for judges with reference to all aspects of the law; however, till this happens, it could be proposed at least for PILs. The law clerks could use the Resource Centres proposed in Action 2 above.

Suggested responsibility: To be initiated by the Ministry of Law and Justice, in consultation with MoEF and other relevant Ministries, to be implemented in co-ordination with the Bar Associations of the relevant Courts.

Time frame: 2 years to introduce the system and to appoint the Law Clerks.

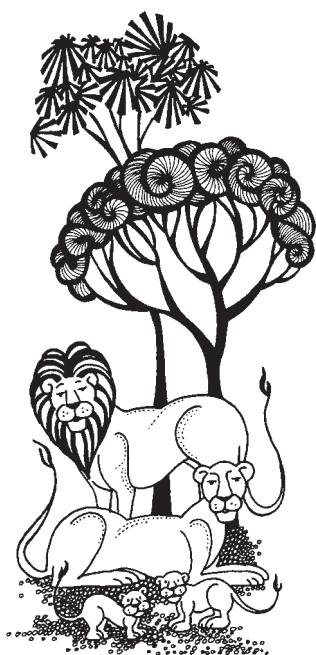
7.1.6.10 Strategy: Orient Financial Institutions to Support Biodiversity Activities

[adapted from *Education, Awareness, and Training BSAP*]

Actions

1. Orient Financial Institutions for Better Support to Biodiversity-Related Activities

Initiate programmes to orient financial institutions, including banks and insurance companies, towards supporting biodiversity-friendly activities, and building possible future impacts of ecological damage into their policies and programmes.





Justification: Financial institutions are today very powerful players in determining the direction of a lot of economic activity. Currently they are rather insensitive to biodiversity issues, and have very little actual programme content to deal with such issues. Loan policies, in the case of agriculture for instance, are usually biodiversity-unfriendly (see Box 5.11). There is therefore an urgent need to orient these institutions to biodiversity concerns, and encourage them to support biodiversity-related activities (see also Sections 7.1.9 and 7.2.9).

Suggested Responsibility: Reserve Bank of India, LIC, and other national financial institutions in association with MoEF, SIDBI, State Industrial Development Corporations, NABARD, Infrastructure Development Finance Company Ltd., other financial corporations, small-scale industry financing institutions, and other public and private banks.

Time Frame: 4 years

Steps:

- i. Assess existing training programmes of key financial institutions to integrate issues of biodiversity;
- ii. Document and disseminate information on positive initiatives that support biodiversity, by financial institutions such as support to organic farming or to non-conventional energy sources;
- iii. Design training programmes to include in local level enterprise, elements of micro-credit that supports sustainable use, collection, processing, and marketing of bioresources;
- iv. Create greater awareness of policy and programmatic opportunities for converting financing activities into biodiversity-friendly ones, including conversion of all loans and grants from activities that destroy biodiversity to alternatives that help conserve it (organic farming instead of intensive chemical-based farming, non-polluting industrial processes instead of polluting ones, etc.);
- v. Explore ways to integrate into insurance policies and programmes, the possible future impacts of ecological/biodiversity loss.

7.1.6.11: Strategy: Build Capacity of The Armed Forces, Police and Customs

Actions

1. Strengthen Current Programmes and Design New Ones to Orient the Armed Forces Towards Biodiversity Conservation

Assess existing programmes for environmental sensitisation of the Armed Forces (including Coast Guard and para-military), and integrate greater biodiversity aspects into them where necessary. Develop new orientation programmes to cover regional and thematic gaps in existing programmes. Initiate collaboration between armed forces and civilians (including between base personnel and surrounding populations) for biodiversity awareness programmes; this should include the use of the bases themselves, within the limits of security considerations, as centres of biodiversity learning.

Justification: The armed forces have ownership and access to some of the country's most biodiversity-rich areas. However, sensitivity towards biodiversity is at best patchy, and there has been no systematic programme towards increasing this sensitivity. Existing programmes, which are currently scattered and sporadic, need to be made more systematic and widespread, and new elements related to biodiversity integrated into them as well as into new programmes.

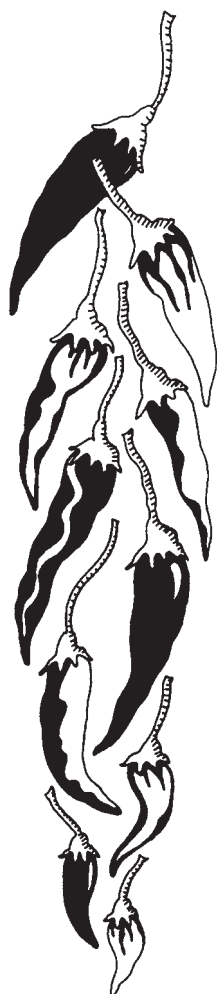
Suggested Responsibility: Ministry of Defence (in particular its Environment centre) and MoEF, through NGOs such as WWF-I, CEE, and BNHS, and institutions such as WII, SACON, and others.

Time Frame: 2 years for reorienting existing programmes, and 5 years to develop new ones or spread them into new areas.

Steps:

- i. Assess the biodiversity content of existing training programmes and strengthen it where applicable; this

- should include programmes being conducted by NGOs like WWF-I and CEE, as also biodiversity documentation programmes such as at the National Defence Academy, Pune (www.ranwa.org.atb/nda.htm);
- ii. WII in consultation with the Ministry of Services/Services Directorate to review the effectiveness of the training programmes conducted and facilitated by them for the defence services and work out a programme for upscaling the training courses and widening this scope to cover various ranks in the defence services;
 - iii. Institute a regular exposure and orientation programme at all key bases, using civilian resource persons and experts;
 - iv. Enhance the role of ex-servicemen, through orientation programmes for retiring personnel, with suggestions for post-retirement activities, which may include initiating and supporting nature clubs, association with CBOs and NGOs, involvement in civic improvement activities, and other such activities.
 - v. Integrate or link the above actions to the proposed Armed Forces Biodiversity Conservation Plan (*see Section 7.1.2.3 Action 5*)



Ongoing Relevant GOI Schemes/Programmes:

- MoEF's Eco-Task Forces Programme Scheme of National Afforestation and Eco-development Board, under Regeneration and Development Programme.

2. Orient and Strengthen Capacity of Police and Customs Towards Biodiversity Conservation Activities

Initiate training and awareness programmes amongst police forces and customs officials regarding biodiversity. In particular, these could focus on the detection and processing of domestic violations relating to wildlife and other relevant laws, the smuggling of biodiversity elements across the border or the illegal introduction of species from outside, and other such activities. Ongoing activities by MoEF, WII and NGOs like Wildlife Trust of India could be built up on.

Justification: The police and customs authorities have a significant role to play in detecting and prosecuting wildlife crimes or other environmental violations that have a bearing on biodiversity. Yet their orientation on these matters is weak, and the capacity to handle complex situations is inadequate.

Suggested Responsibility: Relevant police and customs training institutes, with MoEF and conservation NGOs.

Time Frame: One year to develop curricula and material; training ongoing thereafter.

Steps:

- i. Assign the task of developing course and training curricula and material for this purpose, to a relevant conservation NGO like Wildlife Trust of India, Wildlife Preservation Society of India, or LAW-E;
- ii. Introduce course content in the training institutes where the police and customs officials receive their pre-service and in-service training;
- iii. Organise special refresher in-service workshops with police and customs officials, especially on new and emerging conservation issues, laws and policies.

7.1.6.12 Strategy: Build Capacity of The Corporate and Business Sector

Actions

1. Design Programmes and Packages to Orient Industries to Biodiversity-Related Issues

Develop regular training and orientation programmes on biodiversity for various levels of staff in the corporate sector; these should contain both general ecological awareness aspects, as also aspects that are specific to the site and nature of each corporate or business activity.

Justification: The corporate sector is today amongst the most ignorant or least concerned with respect to biodiversity. Some awareness measures amongst corporate staff are now being taken by industry associations

and NGOs, but these are far from adequate. A massive effort is needed to orient this sector, to make it more sensitive to biodiversity issues, and to convince it that biodiversity-sensitivity makes sound economic sense as well.

Suggested Responsibility: Ministries of Industries, Mines and Minerals, Tourism, Commerce, and others that are dealing with the corporate sector, in association with MoEF, along with industry associations such as FICCI, CII, ASSOCHAM, SIDBI, sector-wise industrial associations, regional development boards and relevant NGOs.

Time Frame: 2 years to develop material and design courses; implementation ongoing thereafter

Steps:

- i. Design, in consultation with industry associations and NGOs, industry-specific educational material and orientation courses;
- ii. Facilitate the running of these courses and the dissemination of this material through the industry associations at central and state levels;
- iii. Foster greater networking and information servicing on biodiversity and environment-related issues for industry and its apex organizations (e.g. the Environment Information Center, a collaborative programme of FICCI, ICICI and USAID, could include biodiversity components in its portfolio);
- iv. Document and disseminate information on alternative ecofriendly technologies and processes, including those for waste minimization, resource-use and transmission efficiency, environmental impact assessments, quality control, etc. (see Sections 7.1.10 and 7.2.10);
- v. Set up forums for dialogue and dispute resolution between industries and the neighbouring or downstream/downwind communities, as a mechanism for creating greater mutual awareness;
- vi. Develop comprehensive databases to help highlight issues of clean production, including updates on the most appropriate traditional and modern technologies and processes available.

2. Promote Responsible Advertising by the Corporate and Development Sector

Ensure that advertising in any form of mass media does not promote ecologically destructive products/processes/events, nor misleads the public towards believing that the such products/processes/events are ecologically safe, nor into believing that they have no other choice when in fact they do. Take appropriate institutional measures to issue guidelines and enforce them.

Justification: Advertising for products, processes, and events in India is replete with messages that are insensitive to environment, biodiversity and communities that are dependent on biodiversity. Commonplace examples are advertisements of the plastics industry. The current code of the Advertising Standards Council of India (see <http://www.blonnet.com/businessline/2001/04/16/stories/101617m3.htm>), offers some elements that could be used to counter this. In particular, it specifies that advertisers should:

- Safeguard against misleading advertisements;
- Ensure that advertisements are not offensive to generally accepted standards of public decency;
- Guard against indiscriminate promotion of products that are hazardous to society.

Unfortunately, in the list of advertisements that the code specifically disallows, there is nothing about environment, human health, or other aspects that could be linked to biodiversity. This component needs to be explicitly integrated.

Suggested Responsibility: Advertising Standards Council of India and industry associations, with guidance from MoEF, Ministry of I&B, Ministry of Telecommunications, environmental communications and media groups, and social action groups that monitor corporate responsibility.

Time Frame: One year for modification of code, monitoring ongoing thereafter

Steps:

- i. ASCI to be encouraged to set up an independent group with governmental authority, consisting of the sec-



- tors/agencies mentioned above, to review current advertising practices and the current advertising code, and suggest modifications therein;
- ii. The revised code to be issued to the corporate and media houses and other relevant agencies;
 - iii. Ministry of Information and Broadcasting and Ministry of Telecommunications to set up an Advertisements Regulation committee, charged with overseeing the implementation of the code.

Ongoing Relevant GOI Schemes/Programmes:

Launching of Mass Awareness Campaign, under Education, Training and Information Programme of the MoEF

7.1.6.13 Strategy: Build Capacity of the Media

Actions

1. Orient Journalists to Biodiversity-Related Issues

Develop and conduct regular orientation sessions for journalists on issues of biodiversity.

Justification: Reporting on ecological issues in newspapers and journals, or in the electronic media, is far from adequate (see Section 6.1.6.2, especially Table 6.7, and *Media and Biodiversity Sub-thematic Review*). Many publications and channels are squeezing the space available for such reporting, there are very few specialised environmental reporters, and much of the reporting has serious factual or analytical deficiencies. Yet, the media has also played a critical role in highlighting many instances of ecological damage, and even influencing changes in policy and programmes. If the above-mentioned gaps are filled, this potential could be considerably enhanced.

Suggested Responsibility: Ministry of Communications, and Ministry of Information and Broadcasting, in association with Indian Institute of Mass Communication, Communication and Journalism Departments of universities, Press Institute of India, state Directorates of Public Relations, the Indian Society of Environmental Journalists, journalist unions, publishing and production houses, and relevant NGOs.

Time Frame: Development of courses within 2 years; implementation ongoing thereafter

Steps:

- i. Develop regionally relevant, thematic material on biodiversity and related livelihood security issues, for mediapersons, and disseminate this material through the above-mentioned and other relevant institutions;
- ii. Develop training and orientation courses for working journalists, to be conducted at the above-mentioned and other relevant institutions;
- iii. Create easily accessible databases on the subject to provide journalists with credible and updated information.

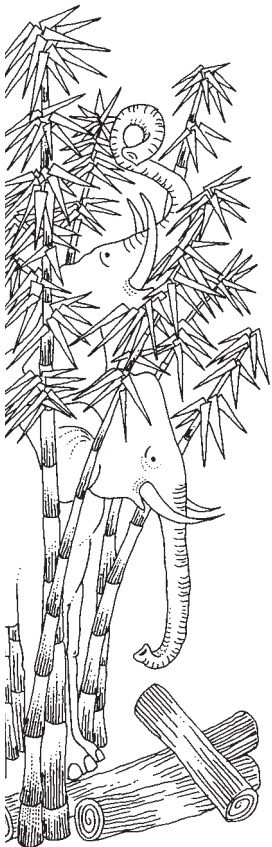
Ongoing Relevant GOI Schemes/Programmes:

MoEF: (i) ENVIS programme, and, (ii) Financial Assistance for Publications Education, Training and Information Programme

2. Integrate Biodiversity into Journalism Course Curricula

Encourage journalism schools and institutes to integrate biodiversity-related issues into the curricula and programmes, and develop 'specialty' journalism courses on biodiversity.

Justification: Journalism schools are crucial centres for orienting reporters; yet biodiversity and environment are not a key subject that they are exposed to here. Integration of these subjects into the journalism courses will help to sensitise them at this early stage, as also offer them the possibility of specialising in biodiversity issues.





Suggested Responsibility: Journalism institutes, Press Institute of India, UGC and other universities, in association with the Indian Society for Environmental Journalists and other NGOs.

Time Frame: 3 years

Steps:

- i. University Grants Commission and universities to expand the curriculum for undergraduate and postgraduate programmes in communication and journalism to include environment and biodiversity as an important subject; where possible, this could be done by broadening already existing subjects such as development communication or development journalism;
- ii. These universities/institutions to develop specific courses and packages for teaching these issues.

3. Provide Incentives to Mediapersons for Better Coverage of Biodiversity Issues

Initiate a range of incentives for mediapersons to encourage them to cover biodiversity issues more regularly and vigorously.

Justification: Mediapersons may be encouraged to write about biodiversity issues if provided with appropriate incentives, and also if they are made aware of relevant events and invited to participate in them.

Suggested Responsibility: MoEF, in association with publishing and production houses, Press Institute of India, relevant trusts, journalist associations, and NGOs, including those that are already offering media fellowships.

Time Frame: Ongoing

Steps:

- i. Increase coverage of environment/biodiversity-related issues by inviting and informing the media about major biodiversity-related events;
- ii. Institute or enhance short-term scholarships and fellowships for journalists and freelancers, as also for journalism and communication students for focused reporting on biodiversity-related issues and events; in so doing, learn from the ongoing initiatives in this by Centre for Science and Environment, National Foundation for India and other organisations;
- iii. Provide incentives to independent features services, such as Women's Feature Service, News from Fields and Slums, Charkha, National Foundation for India, Panos Features, Sarvodaya Press Service etc., to focus on environment/biodiversity features;
- iv. Provide state- and national-level awards for excellence in environmental journalism, both for the vernacular and the English press;
- v. Encourage/support popular magazines and newspapers to carry popular articles/stories on biodiversity issues;
- vi. Provide special incentives for environmental reporting in the vernacular press.

4. Sensitise Newspaper and Magazine Publishing Houses and Radio/Television Companies Towards Biodiversity Issues

Initiate programmes to sensitise companies and media houses that control the Indian media biodiversity issues.

Justification: The responsibility for what should appear in newspapers and on radio/television also rests with publishing houses and radio/television companies. Quite often it is they who dictate the amount of space available for different topics. It is thus important that they be sensitised to biodiversity-related issues (*Media and Biodiversity Sub-thematic Review*).

Suggested Responsibility: MoEF and Ministry of Information and Broadcasting, in association with publishing and production houses and radio/television companies.

Time Frame: Ongoing

Steps:

- i. Conduct consultations with media company owners and managers and impress upon them the need to give more space and time to environmental issues, particularly to biodiversity.
- ii. Seek and establish linkages with donor agencies and non-governmental organizations involved in biodiversity-related activities to sponsor space and time in the media to focus attention on biodiversity.

7.1.6.14 Strategy: Build Capacity of Religious and Spiritual Leaders and Institutions

Build the capacity of religious and spiritual leaders and institutions to take up activities relating to biodiversity.

Justification: Religious and spiritual leaders have considerable influence on their followers, and their institutions are often in the midst of important biodiversity sites or have a significant influence on such sites. Yet in many cases, the influence and position of such leaders and institutions is not used to conserve biodiversity.

Suggested Responsibility: Ministry of Culture, along with national-level associations of various religions, and key site-specific institutions.

Time Frame: Ongoing.

Steps:

- i. Ministry of Culture and MoEF, in association with environmental and religious groups, to develop a set of guidelines on the integration of biodiversity into the activities of religious and spiritual institutions; one particular focus could be on the impacts of pilgrimages on important biodiversity sites, and the impact of other religious activities on natural resources;
- ii. Organise a series of regional and national workshops for religious/spiritual leaders and representatives of religious/spiritual institutions, where ecological orientation could be provided;
- iii. Document best practice cases, where religious institutions or leaders have been able to spread the message of conservation or achieve it in practical terms; provide such leaders with social recognition and awards;
- iv. Facilitate exchanges amongst such people, such as the gathering of community priests responsible for sacred groves held by the National Museum of Man, Bhopal.

7.1.6.15 Strategy: Strengthen Information Dissemination Systems

Actions

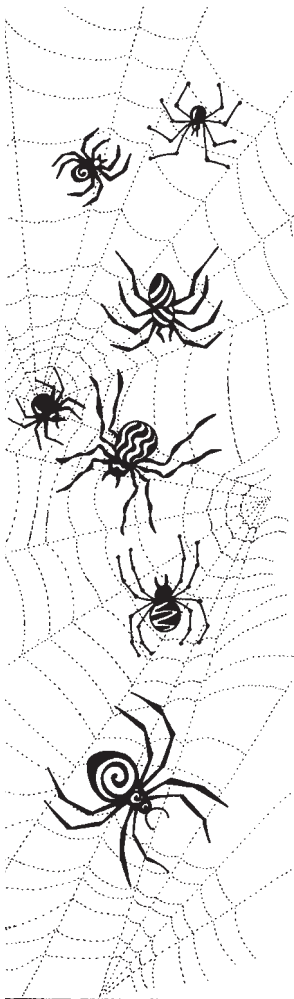
1. Ensure Proactive and Strategic Information Dissemination Through the Existing Environmental Information Systems and Merge Them into an Indian Biodiversity Information System (IBIS)

Enhance the capacity of existing information dissemination systems on environment, to handle complex biodiversity issues, to reach out to larger numbers of people, and to be able to network with each other to create a consolidated system; put these together into an Indian Biodiversity Information System (IBIS) (*see Section 7.1.1.2; and Biodiversity Information System Sub-thematic Review*).

Justification: The MoEF has an already existing network of environmental information centers through ENVIS; in addition, there are several NGO or other institutional information dissemination services. All of these need to be upgraded, linked and networked through one system which is simultaneously centralised in its coordination and decentralised in its functioning.

Suggested Responsibility: MoEF, National Informatics Centre, relevant ENVIS centres, IGCMC, ICFRE, and other institutions with information dissemination systems in place or proposed.

Time Frame: 2 years



Steps:

- i. Assess the performance of the ENVIS system, and revise it to fully integrate biodiversity, to make it more proactive in dissemination of information, to eliminate centres which have been non-functional and strengthen those that need further support; and facilitate the creation of the nodes on various disciplines as proposed under the India Environment Management and Capacity Building Technology Assistance Project (EMCBTAP);
- ii. Conduct workshops at the ENVIS centers and nodes for planning strategic communication activities and methods for disseminating the information;
- iii. Set up IBIS as an independently housed, information collection and dissemination system, supported by MoEF but autonomous in its functioning, through which all existing key information systems could be coordinated (for details, see Strategy 7.1.1.2);

Ongoing Relevant GOI Schemes/Programmes:

ENVIS Programme under Education, Training and Information Programme of MoEF

2. Bridge the Information and Capacity Gap in Critical Areas Like Taxonomy

Support at a countrywide level the revival and development of critical research areas like taxonomy, building on the All-India Taxonomy Project. Use both traditional community taxonomic practices and new tools like information technology, interactive CDs, pattern recognition systems etc., that cut down time and labouriousness of conventional taxonomic practices.

Justification: The subject of taxonomy is absolutely vital to identify and document biodiversity in the wild; unfortunately, this is a dying subject and needs to be revived urgently.

Suggested Responsibility: MoEF and UGC, through universities and colleges, ZSI and BSI regional units, ICFRE, relevant institutes like WII, BNHS and SACON, and local community experts.

Time Frame: 5 years

Steps:

- i. Produce cheap and popular field guides on flora and fauna in local languages, to facilitate better understanding and popularize biodiversity (MoEF 1999b);
- ii. Conduct training programmes to build a cadre of para-taxonomists drawn from the local community, working closely with college teachers/students to help in the documentation and dissemination of biodiversity information; learn from ongoing initiatives such as the village and field botanist programme of FRLHT;
- iii. Emphasise to the UGC that taxonomy should continue to be offered in all college zoology, botany, and microbiology courses at the undergraduate and postgraduate levels;
- iv. Ensure that taxonomy is an important component of workshops and meetings on biodiversity.

Ongoing Relevant GOI Schemes/Programmes:

MoEF's (i) All India Co-ordinated Project on Taxonomy, Biodiversity Conservation, and (ii) Financial Assistance for Publications under the Education, Training and Information Programme

3. Integrate Biodiversity into District Gazetteers, and Formulate District Environment/Biodiversity Gazetteers

Integrate biodiversity as a central component in district gazetteers, containing comprehensive information on the range, status, trends, and conservation of the district's wild and domesticated biodiversity. This should be periodically updated, and cover the key concerns, problems, initiatives and directions that biodiversity issues are taking in the district.

Since updating and revision of district gazetteers only takes place after a considerable period, District Environment and Biodiversity Registers could be formulated as a linked but independent exercise. These could be more in-depth than the information in the general district gazetteers, and could be updated on a more frequent basis.

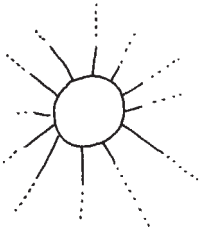


Suggested Responsibility: Relevant state- and district-level authorities, local NGOs and community representatives, with advice from MoEF and MoA, institutions like ZSI, BSI, NBPGR, NBAGR, and NBFGR, other biodiversity experts, and national-level NGOs.

Time Frame: 3 years for preparation of environment/biodiversity gazetteers and for integration into existing district gazetteers; the latter to be updated every 5 years thereafter.

Steps:

- i. MoEF and MoA to work with relevant institutions and experts to develop guidelines and formats for periodically integrating biodiversity related information into the district gazetteers and for the stand-alone district environment/biodiversity gazetteers;
- ii. District biodiversity gazetteer teams to be set up for each district, comprising NGOs, institutions, officials, and community members, with independent functioning but with committed support from the state/district authorities.
- iii. Orientation sessions with these teams, officers of the district administration, NGOs and communities to be carried out;
- iv. The teams to then work with district officials in charge of the district gazetteers, State Forest Departments, Environment Departments, Life Science Colleges, local communities and NGOs, to access and document biodiversity related information;
- v. Draft chapters on biodiversity, to be made public for some time, inviting comments and inputs, before being finalised and published. Such public review is critical as this will be considered the authentic record of the district's biodiversity, and must contain the wisdom and information of all relevant sectors in the area;
- vi. A format to be developed for a stand-alone District Environment/Biodiversity Gazetteer, and guidelines modified from the above issued to all districts for its preparation through a participatory process;
- vii. MoEF to periodically assess progress and quality of the outputs, and offer assistance to districts with weak processes.



4. Make Creative Use of Public Transport as an Educational Tool

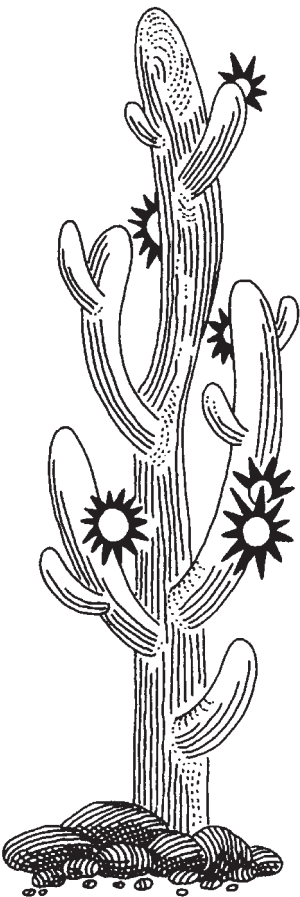
Use public transport, including railways, airlines, and roadways, as an environment education tool. For instance, in the case of the railways network (including urban metros) a series of measures could include:

- i. Signage superimposed on maps placed in compartments, relating to natural and agro-biodiversity sites that the train is passing through;
- ii. Signage in the compartments regarding the ill-effects of garbage thrown out of the window, and other such 'dos' and 'don'ts' for passengers;
- iii. Signage in railway stations and booking centres;
- iv. Public announcements, in trains that have such a system, on the above;
- v. Appropriate messages behind tickets, inside railway timetables, and other relevant material that passengers use;
- vi. Use of railways lands on both sides of the tracks for educational activities;

Similar measures could be developed for long-distance and urban buses, air travel (e.g. articles in in-flight magazines), etc., as biodiversity educational tools.

Justification: Millions of people travel on India's railways, airlines, and public roadways every year, yet there has not been a comprehensive attempt at using this as an opportunity for spreading ecological awareness. Indeed, these means of transport and their related infrastructure are often a major source of ecological destruction, including through inappropriate routing, creation of economic magnets that adversely impact surrounding natural areas, the generation of enormous amounts of litter on both sides of tracks/roads, and pollution. It is therefore urgent that the opportunity for public transport to become an educational tool be used, and the negative impacts be minimised by passenger education and other means.

Suggested Responsibility: Ministry of Railways, Ministry of Road Transport and Highways, Ministry of Civil



Aviation, along with MoEF, through railway, bus, and airline staff associations, and environmental NGOs and institutions in each state.

Time Frame: 5 years on key selected routes; 10 years for the remaining.

Steps:

- i. Ministry of Railways, Ministry of Surface Transport, Ministry of Civil Aviation and MoEF to set up a working group to suggest specific measures to be taken for maximising the use of the system for educational purposes, and identifying key routes to be taken up for implementation in the first phase; the group should consist of environment education NGOs and experts, and also relevant government officials;
- ii. Build the capacity of railways/roadways/airlines staff, and others, to implement the above suggestions, and implement them thereafter on the identified routes;
- iii. Monitor the impact of these measures through appropriate commuter surveys and through physical checks along railway tracks, roads, etc.;
- iv. Spread the measures, appropriately modified on the basis of the results of the monitoring, to other routes.

Ongoing Relevant GOI Schemes/Programmes:

MoEF: (i) Non-Formal Environment Education and Awareness and (ii) Launching of Mass Awareness Campaign under the Education, Training and Information Programme.

7.1.7 Wild Biodiversity: Strategies and Actions for Inter-Sectoral Integration of Biodiversity

Overall strategies:

1. **Orient planning and programmes of all sectors, towards integrating biodiversity and biodiversity-related livelihoods as central concerns**, including through processes at local, district, state, inter-state and national levels; give special focus to sectors like water, energy, infrastructure and mining; empower decentralised forums of decision-making and institutional structures for inter-sectoral/departmental coordination to achieve such integration;
2. **Ensure integration of biodiversity into international relations**, including the sensitisation of foreign aid and foreign investments coming into India, and international agreements to which India is party.

7.1.7.1 Strategy: Integrate Biodiversity Concerns Through Inter-Sectoral Coordination, at all Levels of Planning

Actions

1. Formulate Guidelines for Inter-Sectoral Integration of Biodiversity at Local to National Levels

Formulate a set of guidelines for inter-sectoral coordination and the integration of biodiversity into all sectoral planning and implementation. These guidelines should have the flexibility to accommodate diverse ecological, socio-cultural and political situations, in a culture- and gender-sensitive manner. Such guidelines should incorporate steps to be taken at local (village/hamlet/town/ward/locality), district, state and national levels.

Justification: Though decentralised and integrated planning is currently accepted in development and conservation circles, a coherent set of guidelines and orientation materials to facilitate such a process do not exist. Such a set of guidelines, which can be easily understood and applied at all levels and by both government officials and citizens, is an urgent necessity.

Suggested Responsibility: Central and state governments, through the relevant ministries and departments (including Rural Development, Tribal Affairs, Social Justice and Empowerment, Environment and Forests, and others), in collaboration with PRIs and municipal authorities.



Time Frame: One year

Steps:

- i. Government of India (relevant ministries mentioned above) to set up a joint committee, chaired by an expert (non-governmental or non-serving official), and consisting of experts and experienced people dealing with decentralised planning, including representatives of communities that have successfully implemented integrated planning processes.
- ii. The Committee to hold a series of public hearings in representative regions of the country, and with a wide range of actors, in particular to listen to the voices of those most dependent on biological resources, especially women and other underprivileged sections.
- iii. Draft guidelines to be circulated widely for comments, finalised, and issued under the laws related to the 73rd and 74th Constitutional Amendments, including the Panchayat (Extension to Scheduled Areas) Act, 1996.

2. Ensure Inter-Sectoral Integration of Biodiversity at Local Settlement Level

Facilitate the revival, creation, or strengthening of inter-sectoral coordination and integration at the level of the individual settlement (village, hamlet, town ward), to implement the guidelines developed in *Action 1* above. This would involve:

- i. Empowering the village council (*gram sabha* or equivalent, with all adult women and men as members) or urban ward to handle all the affairs of the settlement relating to land, biological resources, water, and other resources, with appropriate facilitation by relevant government departments;
- ii. Making all government departments accountable to the village council or urban ward, as is already beginning to happen in some states.

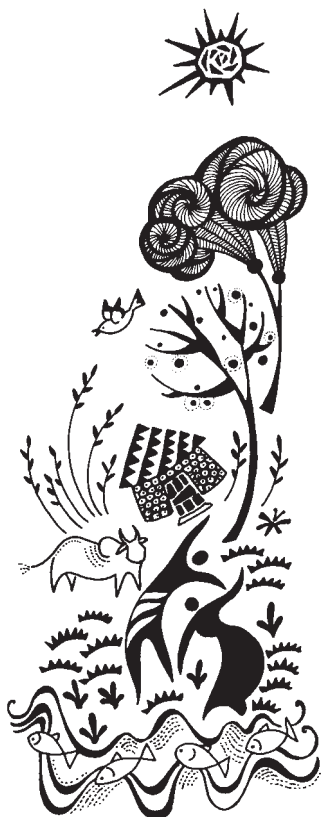
Justification: Since the local settlement (hamlet, village, or town locality) is the most tangible unit for planning, where the linkages and feedback mechanisms amongst all sectors of life are most visible and strong, inter-sectoral coordination and integration needs to start at this level. Unfortunately, while settlements have often traditionally built up customary rules for such integration, the imposition of compartmentalised and departmental planning as also sectoral politics, has disrupted such a process. There is therefore a need for reviving customary practices of integration, as also to bring in new methods and practices that would be relevant for current contexts.

Suggested Responsibility: Community representatives from sites that have carried out integrated planning, with facilitation by the Ministries of Tribal Affairs, Rural Development, Social Justice and Empowerment, and Environment and Forests, and relevant NGOs and academic institutions;

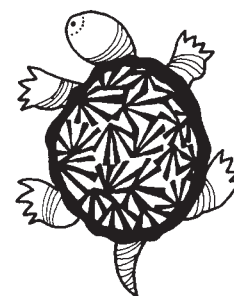
Time Frame: 5 years for the first set of settlements (see below); 15 years (three five-year plan periods) for the remaining

Steps:

- i. Document and learn from ongoing successful processes of local settlement-level planning, such as Mendha (Lekha), Ralegan Siddhi and Hiware Bazaar in Maharashtra (see *Chapter 6.1.7.2*, and *Maharashtra State BSAP*).
- ii. Select a representative sample of settlements in each state (chosen on the basis of criteria like the availability of an active CBO or NGO, and other ecological/social criteria), to implement the above-mentioned guidelines and the lessons learnt from ongoing initiatives, through the village councils or through Biodiversity Management Committees under the Biological Diversity Act (see also Governance Actions under *Section 7.3*);
- iii. Facilitate capacity-building of communities and institutions in these settlements, to implement these guidelines through relevant training institutes and grass-roots orientation exercises; such exercises need to be gender-, equity- and culture-sensitive;
- iv. Ensure the generation, availability and enhancement of information and knowledge relevant to biodiversity, in local languages, and in oral, written/print, and electronic media, including through Community or People's Biodiversity Registers (see also actions relevant to local database management and right to information, in *Strategies 7.1.5.4 and 7.1.8.8*);



- v. Institutionalise processes and structures of handling and deciding on the utilisation of all funds for the settlement, by the village council, in a transparent, gender-sensitive and open manner (see also Section 7.1.9), with the appropriate involvement of government departments whose actions should be made accountable to the council;
- vi. Encourage the use of innovative tools for integrated village planning, e.g. those being tried out in states like Maharashtra (*panchayat panchang* or annual calendar of events with ecological activities built in; and programmes such as the Adarsh Gaon Yojana, see *Maharashtra State BSAP*);
- vii. Take measures similar to (i) to (vi) above, with appropriate modifications for urban situations, in the case of town/city wards and localities, with the residents' associations closely involved at all levels of planning; and;
- viii. Extend these measures, with appropriate learning from the initial settlements, to all other settlements across the country.



3. Ensure Inter-Sectoral Integration of Biodiversity at District Level

Ensure inter-sectoral coordination and integration of biodiversity and biodiversity-based livelihoods into the district planning process, through District Planning Committees.

(also see Annexure 16).

Justification: District-level planning is becoming a crucial fulcrum of planning in India, especially with political and financial decentralisation. Ensuring environmental conservation in an array of disparate activities is one amongst the many reasons listed for constitution of District Planning Committees under the 73rd and 74th Constitutional Amendments. However, very little has been proposed in terms of mechanisms to ensure that the activities/schemes proposed conform to environmental concerns including biodiversity conservation and the protection of biodiversity-based livelihoods. Therefore, district planning needs to be infused with biodiversity concerns.

Suggested Responsibility: State Planning Boards along with State Biodiversity Boards as proposed under the Biological Diversity Act, and district planning bodies as relevant, with the central involvement of local community institutions mentioned in *Action 2* above; assistance from Ministry of Rural Development, Ministry of Tribal Affairs, etc.

Time Frame: 5 years for initial set of districts (see below); 15 years for the remaining.

Steps:

- i. Document and learn from ongoing initiatives of district-level biodiversity integration, such as in Seoni district in Madhya Pradesh and other districts that are being taken up in this state as a result of a governmental circular (see Section 6.1.7.2);
- ii. Select on the advice of the Committee set up under *Action 1* above, a representative sample of districts from each state for the implementation of the above-mentioned guidelines and the lessons learnt from ongoing initiatives;
- iii. Build the capacity of District Planning Committees from this sample, through appropriate *panchayat* training institutes and local orientation sessions, to implement the guidelines;
- iv. Facilitate, through provision of appropriate resources, such implementation;
- v. Extend the guidelines to district planning all over the country, after assessment of the lessons from the first sample of districts;
- vi. Bring into the procedures of the State Planning Boards a stipulation that no draft plan for district development put up by the DPCs shall be approved unless biodiversity concerns are adequately integrated, and unless these are built on local settlement-level planning processes involving all sections of the community (see Section 7.0.1); and that in so doing, the State Biodiversity Boards (once set up) are fully consulted.

4. Ensure Inter-Sectoral Integration of Biodiversity at State and Central Levels

Ensure that biodiversity concerns are integrated into the sectoral planning process at state and central government levels, and become a central and compulsory consideration in such planning. This should include the re-orientation of all development and welfare schemes of state and central governments, to make biodiversity and

biodiversity-based livelihoods (including gender and equity concerns) a critical consideration in planning and implementation (see Box 7.1.7.1).

Justification: Most decisions regarding the use of natural resources and land/water uses that impact on biodiversity are taken within individual ministries and departments of the central and state government. Though environmental awareness in these agencies has increased, there is still little appreciation of the centrality of biodiversity issues, and even less capacity to achieve this centrality in planning. Consequently most sectoral planning at these levels needs to go a long distance in integrating biodiversity and related livelihood concerns.

Suggested Responsibility: Ministry of Environment and Forests and the Planning Commission at central government level; Department of Environment (or equivalent) and Planning Department or Board, at state government level; in collaboration with institutions, NGOs, and community representatives experienced in decentralised planning.

Time Frame: One year for review of schemes (see below); 10 years for implementation (i.e. by the 12th 5-Year Plan, but with an initial set of targets to be achieved by the 11th 5-Year Plan).

Steps:

- i. Set up, under the Planning Commission, a committee composed of women and men with experience in decentralised and ecologically sensitive planning (including from communities that have successfully demonstrated such planning) to review and modify the guidelines relevant to all Government of India and state government schemes and programmes, with the aim to ensure the integration of biodiversity into these;
- ii. Progressively orient the implementation of these schemes and programmes towards achieving such integration;
- iii. Extend the provisions of environmental impact assessment and environment and forest clearances to all development projects and all developmental policies and programmes including macro-economic policies (see also Section 7.1.8);
- iv. Build into the Planning Commission's procedures a stipulation that all plan and budget proposals from states and from GOI ministries should show how biodiversity concerns have been integrated (including, in the case of state plans and budgets, into local and district plans);
- v. Empower the committee mentioned above to monitor and advise the GOI ministries and state governments in their achievement of biodiversity integration;
- vi. Pursue similar measures at local, state and inter-state ecoregional levels (see Box 7.1.7.1 on measures suggested in various State BSAPs).

Box 7.1.7.1 Inter-Sectoral Integration at the State Level

(Recommendations from various BSAPs)

Several State BSAPs under the NBSAP process have recommended strategies and actions on inter-sectoral integration. Some examples:

- The **Rajasthan State BSAP**, building on considerable inter-sectoral discussions during the formulation process, recommends:
 - i. A central mechanism for coordinating the economic development of the state, with a clear focus on environmental soundness and ecological security, and inclusion of environmental costs in economic/financial planning;
 - ii. Review of all the sectoral policies and programmes to test their ecological soundness;
 - iii. Introduction of bioregional planning;
 - iv. Environmental impact assessment to be made mandatory for all sectoral activities;
 - v. Modification or adaptation of existing sectoral programmes to achieve the objective of biodiversity conservation as a co-objective within the programmes.
- The **Madhya Pradesh State BSAP** includes a strategy on 'formulating an integrated policy and legislative framework

for conservation and sustainable use, and equitable sharing from benefits of biological diversity.' The strategy elaborates on the need to mainstream biodiversity concerns into the district planning processes as well the overall developmental processes.

- The **Sikkim State BSAP** presents a matrix on highlighting the 'Approach and initiatives of Inter-linked Sectors in the State Government.' It goes on to look at the various sectors (including Agriculture and Allied Activities, Rural Development, Irrigation and Flood Control, Energy, Transport, Science, Technology and Environment, Social Services, and Urban and Regional Planning and Development) with a brief description of their programmes and schemes, followed by an analysis of the gaps and strategies to deal with the same.
- The **Punjab State BSAP** highlights the need for 'integrating and coordinating biodiversity with sectoral and district-level plans embracing ecological, social and economic aspects which encourage sustainable development. Building on this, one of the strategies (to be promoted and implemented by the State Department of Science and Technology) is the need for 'all relevant government departments/academic institutions/NGOs to identify nodal officers (preferably out of existing staff) to look at biodiversity-related issues in projects and plans of their respective departments/institutions/areas at their own level.'
- The **Karnataka State BSAP** includes a strategy for 'formulating an integrated policy and legislative framework for the conservation, sustainable use and equitable sharing of benefits.' This has been included keeping in mind the need to broaden biodiversity conservation efforts and link them to sustainable use and equitable sharing of benefits. Specific action points include integrating biodiversity concerns into the functioning of civic bodies, establishment of State-, District- and Panchayat-level Biodiversity Management Institutions, etc.
- The **Mizoram State BSAP** suggests an integrated land use approach, involving coordination amongst departments like Land Revenue, Agriculture, Animal Husbandry and Veterinary, Rural Development, PWD, Tourism, Horticulture, Power, Fisheries, Soil and Water Conservation, etc. This can be done through joint committees, earmarking a part of the budget of each department for biodiversity, and harmonisation of laws/policies governing the work of each department.

5. Move Towards Ecoregional Planning

Initiate planning processes that dovetail local-, district-, state- and national-level processes with ecoregional planning (For details, see *Section 7.0.1* on landscape/waterscape planning.).

6. Create State and National Level Institutional Structures for Inter-Sectoral Integration

Set up a National Biodiversity Authority, State Biodiversity Boards, Ecoregional Authorities, and a standing committee on biodiversity integration at the Planning Commission. (For details, see Chapter 8).

7. Build Capacity of Officials at all Levels of Governance to Integrate Biodiversity Concerns

(For details, see *Strategy 7.1.6.1*).

8. Integrate Funding for Biodiversity Concerns into Each Government Agency's Budget

(For details, see *Strategy 7.1.9.2*)

7.1.7.2 Strategy: Integrate Biodiversity into Water Planning

Actions

1. Ensure that National and State Sater Programmes Integrate Biodiversity Concerns and Values

(See also *Strategy 7.1.8.1, Action 1*).

Integrate biodiversity and biodiversity-based livelihood concerns into all water-related programmes at central and state levels. This would include watershed development programmes, as well as water distribution and provision schemes. The measures should include protection of ecosystems in catchment and source areas, inclusion of the true hydrological value of natural ecosystems (see *Economics and Valuation of Biodiversity Thematic BSAP*) into plans and budgets, and integration of equity in the management and sharing of water resources.



Justification: The true contribution of biodiversity to the nation's water security is seriously undervalued, and relatively unrecognised. Due to this, water policies and programmes, and plans/budgets in general, do not integrate conservation. Simultaneously, the importance of maintaining natural water cycles, including freshwater flows, to the maintenance of biodiversity is consistently ignored in water development policies and programmes. The measures listed above will help in both biodiversity conservation and in ensuring water security.

Suggested Responsibility: Ministry of Water Resources, Ministry of Environment and Forests, Ministry of Agriculture, Ministry of Rural Development, state departments of Water and Watershed, Irrigation, Forests, Agriculture, etc., PRIs and village communities in source/catchment areas, CAPART, people's networks such as Jal Biradari, etc.; in the north-eastern states, district and autonomous councils in collaboration with traditional/customary village institutions, water users groups, watershed committees, etc.

Time Frame: 5 years

Steps:

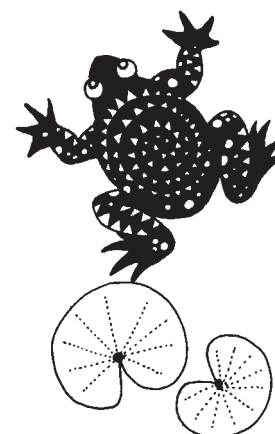
- i. Conduct studies of the specific contribution of forests, grasslands and wetlands to the water security of the nation, including valuation of this contribution and the inclusion of this value into the national budget and planning (*see Economics and Valuation of Biodiversity Thematic BSAP*);
- ii. Declare of natural ecosystems at the sources of all rivers as ecologically sensitive areas under the Environmental Protection Act, or some other equivalent category of conservation in another appropriate law;
- iii. Protect existing natural forests and grasslands, or restoration of degraded ecosystems, using local species, in all catchments of water bodies;
- iv. Encourage decentralised water harvesting structures in urban and rural areas, and mandatory provisions for roof-top water harvesting in urban areas (as already mandated for new structures in some cities like Bangalore, Chennai and Delhi);
- v. Revive or introduce community or joint control and management of local-level water bodies, and larger scale community-based and joint institutions for larger waterbodies (*see Landscape/waterscape Planning and Governance Structures, Section 7.0.1*);
- vi. Learning from successful community, NGO or official initiatives towards such ecologically sensitive water development (such as those mentioned in *Section 6.1.7.2*; *see also Arvari Sub-state BSAP, and Nahin Kalan Sub-state BSAP*);
- vii. Ensure maintenance of essential water flows in all basins of the country, including river flow into the oceans/seas, to ensure the continuing health of ecosystems that depend on such natural flows and cycles (e.g. mangroves dependent on a precise mix of freshwater coming from inland and saltwater of the sea, or aquatic fauna species that survive on such finely tuned conditions);
- viii. Integrate the above principles and steps into all water-related programmes and their guidelines, e.g. the Watershed Development Guidelines, 2001, of the MoRD (*see also Strategy 7.2.7.1, Action 1*);
- ix. Introduce changes in the National Water Policy, as well as state level policies, if any, and in other relevant laws, to facilitate the above.

Ongoing Relevant GOI Schemes/Programmes:

- The National Watershed Development Project for Rainfed Areas, (ii) Watershed Development Fund, and (iii) Externally Aided Projects under Rainfed Farming System Programme of the Ministry of Agriculture.
- The Centrally Sponsored Scheme of Soil Conservation for Enhancing Productivity of Degraded Lands in the Catchments of River Valley Projects and Flood Prone Rivers (RVP & FPR)-Subsumed under Macro management Scheme, (ii) Scheme of Watershed Development Project in Shifting Cultivation Areas Scheme, and (iii) Externally Aided projects under Natural Resource Management Programme of the Ministry of Rural Development
- The International Co-operation Programme, Ministry of Rural Development.
- The Hill Areas Development Programme/Western Ghats Development Programme, Planning Commission.



- The (i) Sampoorna Grameen Rozgar Yojana, (ii) Integrated Wastelands Development Programme, (iii) Drought Prone Areas Programme, (iv) Desert Development Programme, (v) International Co-operation Programme (vi) Other Schemes of Wasteland Development, (vii) Rural Water Supply And Sanitation Programme, Ministry of Rural Development.
- The Watershed Development Programme, CAPART
- The Accelerated Urban water Supply Programme, Ministry of Urban Development and Poverty Alleviation



2. Move Away from Mega-Projects to Decentralised Water Harvesting Schemes

Conduct thorough impact assessments of all proposed river valley projects, including large-scale inter-basin transfers, and phase out plans for such projects, especially in ecologically fragile areas, such as most of the north-eastern region (see *Dams and Biodiversity Sub-thematic Review*; see also Box 7.1.7.2 on recommendations from various BSAPs). Focus increasingly on decentralised and participatory water harvesting schemes.

Justification: Major river valley projects inevitably cause significant social and biodiversity disruption (see Box 5.4 for details and examples). Large-scale inter-basin transfers, such as those being proposed in the River Inter-linking scheme, are likely to cause such disruption and related impacts on livelihoods. Impact assessments and public consultation for such projects remain weak and flawed; this is at least partly because current human knowledge on biodiversity and ecosystem functions is severely inadequate (see Boxes 6.1 and 6.41). They are also inadequate because they are undertaken for each project in isolation, whereas the combined impact of multiple projects in the same basin could be much greater. In addition, there are viable and demonstrated alternative, decentralised water harvesting methods that can be applied to diverse climatic and agro-ecological regions of the country. Such methods, if sensitively applied, would not be ecologically destructive, and could help in regenerating ecosystems and reviving biodiversity in degraded systems.

Suggested Responsibility: Ministry of Water Resources, MoEF, EIA consultants, people's movements and networks like the National Alliance of People's Movements and Bharat Jan Andolan, community experts and NGOs working on decentralised water harvesting, and other organisations which have been working on river valley project issues such as South Asia Network on Dams, Rivers and People (SANDRP).

Time Frame: Ongoing

Steps:

- Ensure that all proposed new river valley projects are transparently planned, by making public all relevant documents, holding widespread public hearings in the areas of possible impact, and commissioning independent impact assessments (following the recommendations in Box 7.1.7.2; see also *Dams and Biodiversity Sub-thematic Review*);
- Conduct impact assessments of the combined effect of projects within the same basin, or across basins where the impacts are related; these should be based on carrying capacity studies of the ecosystems in the concerned basins;
- Ensure that decisions regarding such projects, including the proposed river linking plan, or the proposed set of dams for the north-eastern region, are taken only after the steps above are implemented;
- Integrate into relevant policy the principle that projects with major negative impacts on biodiversity (and related livelihoods) will not be pursued;
- Consider the recommendations of the independent studies commissioned under the World Commission on Dams (WCD 2000, Singh and Banerji 2002; see also *Dams and Biodiversity Sub-thematic Review*);
- Facilitate much more widespread use of decentralised water harvesting methods and technologies, especially by supporting community-level exchange visits, and providing the necessary financial, technical, and administrative back-up;
- Facilitate community level mobilisation through people's groups and networks, especially towards finding decentralised solutions to water problems.

Box 7.1.7.2 River Valley Projects and Biodiversity

(Strategies in various BSAPs)

- The **Arunachal Pradesh State BSAP** highlights the need for agencies involved in major development projects of inter-state nature like catchment area development, construction of dams, roads, railways, soil conservation and river communication system to consult local communities, and evolve strategies for environmental and livelihood security before launching the projects.
- The **Mizoram State BSAP** has suggested that 'big dams should not be encouraged and hydel projects should not be done in ecologically sensitive areas (ESAs).' Further, 'alternatives like wind energy, solar energy, micro-hydel and run of the river projects need to be explored more seriously.' Public objections to proposed projects like Bairabi have been noted.
- As part of its strategy for conservation of aquatic ecosystems, the **Punjab State BSAP** has suggested that the impacts of large dams, irrigation canals and drains on biodiversity need to be studied. Also, minimum flow of water in downstream areas should be ensured through an appropriate policy.
- The **Rajasthan State BSAP** has highlighted the impacts of the Indira Gandhi Nahar Pariyojana (IGNP), including the introduction of alien species. Further it has an action point towards conducting 'detailed scientific survey and study in the command and trans-boundary areas of the Indira Gandhi Nahar Pariyojana, where deep level ecological changes are taking place.'
- The **Manipur State BSAP** recommends a critical ecological examination of the impact of the proposed Tipaimukh Dam and Loktak Downstream Project to decide about their viability.
- As part of its strategies for tackling trans-boundary issues, the **Central Forest Belt Ecoregional BSAP** has highlighted the need to give up the construction of the proposed Bhopalpattanam Dam on the Indravati River, due to its impact on the area's forests and wildlife.
- Noting the adverse impacts of dams and barrages on the biodiversity of the Ganges (e.g. the Gangetic dolphin and *Hilsa* fish), the **Gangetic Plains Ecoregional BSAP** has suggested impact assessments of such projects on aquatic biodiversity, setting up of migration corridors on the barrages, and construction of fish ladders.

Several other BSAPs have highlighted the serious ecological impacts caused by major dams and irrigation projects. The **Kachhh Sub-state Site BSAP**, for instance, states that one of the causes of biodiversity degradation is the fragmentation of the Wild Ass habitat due to the Narmada Canal. The **Vidarbha Sub-state Site BSAP** says that a large chunk of forest areas have been diverted for dam construction, submergence, canals, residential colonies, and roads.

7.1.7.3 Strategy: Integrate Biodiversity into Energy and Infrastructure Planning

(See also Strategy 7.1.10.1)

Actions

1. Ensure that All Energy and Infrastructure Development is Respectful of Biodiversity Concerns

Integrate biodiversity (and related livelihoods) as a central planning parameter into all projects and processes relating to energy and infrastructure development (roads, railways, ports, transport, and so on). Conduct full, publicly transparent reviews of major energy projects, and progressively move towards non-conventional energy sources that are generally ecologically and socially sensitive. Move also towards infrastructure projects and technologies that respect ecological processes and sensitive areas. In particular, review mega-infrastructure developments like the National Highways Project, and consider alternatives that would be ecologically more sensitive.

Justification: Most conventional energy and infrastructure development is insensitive to biodiversity concerns, and has caused considerable loss to ecosystems and species (see Chapter 5.1). This process continues with the development of mega-projects in the energy sector, the national highways project, etc. EIA processes have introduced some element of sensitivity into such development, but much more needs to be done. While some ecological damage is inevitable, no further loss of critical ecosystems or threats to species should be allowed.

Suggested Responsibility: Planning Commission, Ministry of Power, Ministry of Road Transport, Ministry of Railways, Ministry of Non-Conventional Energy Sources, relevant state departments, Infrastructure Development Finance Company Ltd., and other relevant financial institutions, technical institutions and public/private sector corporations working on energy and infrastructure, and relevant people's networks and NGOs that have been active on these issues.

Time Frame: Two years for proposed guidelines and for initial round of orientation; ongoing there-after

Steps:

- i. Planning Commission or other relevant GOI agency to set up a working group to develop clear guidelines for the integration of biodiversity into energy and infrastructure development; the group should include, apart from the relevant government agencies, national level NGOs and people's networks;
- ii. Orientation workshops to be held to sensitise agencies involved with such development, starting with the personnel of key national and state agencies/departments;
- iii. Independent monitoring processes to be initiated to assess the implementation of the guidelines and of relevant EIA and clearance procedures (*see also Box 7.1.7.3*);
- iv. Review the ongoing National Highways Project (especially its impact on hundreds of thousands of trees and the biodiversity they harbour; *see Section 5.1*), conducting a thorough EIA through an independent and transparent process, and involving public hearings at every proposed site for highway development; consider all possible alternatives as part of this review, while staying further construction till the review is complete;
- v. Review all ongoing and proposed mega-energy projects, and move towards a major programme on non-conventional and decentralised energy sources, to enable their full potential to be met (following the recommendations in *Section 7.1.10.1, Action 4*; *see also, as an example, the recommendations relating to Thermal Power, Box 7.1.7.3*).

Box 7.1.7.3 Making Thermal Power Biodiversity-Friendly

To mitigate the impact of Indian thermal power plants on biodiversity, short-term, medium-term and long-term measures need to be adopted.

In the **short-term** (5-7 years), the following measures should be adopted:

1. A multi-disciplinary scientific group should be commissioned to write a comprehensive paper on thermal power and biodiversity, including the phyto-toxic effects of specific pollutants, the big picture using tools such as eco-system analysis, and the actual impact that thermal power policy and its implementation have had on biodiversity. The group should also write a draft policy on this subject for the government's consideration.
2. The monitoring of wet and dry acidic deposition and its impact on soils, vegetation and aquatic environments should begin immediately. The monitoring methods are available in the public domain. To monitor depositions and their impacts (in non-trans-boundary situations), the Andhra Pradesh Pollution Control Board (APPCB) has ordered a group of industries in Kakinada to jointly set up a monitoring station in the Coringa sanctuary. Many more such stations are required at industrial concentrations all over the country. Monitoring of depositions and their impacts should be done also by other agencies (educational institutes, NGOs etc.) by using methods which do not require sophisticated instruments. This allows for independent verification of data and results and also involves wider public participation in understanding the risk posed by the acidification. Such simple methods are being developed.
3. Green lung is a patch green cover meant to absorb pollutants. Such green lung plantations should be developed with pollution-resistant species on government and other waste lands in a 10 km radius around thermal power plants. The Air Pollution Tolerance Index, along with knowledge of hardy local species, may be used to choose plant species. The cost of developing the plantations should be borne by the thermal power plants, and management may initially be done by a joint committee of the thermal plant, Forest Department and panchayats, and eventually by the panchayats. The APPCB has ordered several thermal power and cement plants to do feasibility studies for developing green lungs around their plants.
4. There are well known bio-indicators for air pollutants. The APPCB has ordered several thermal power and cement plants to plant bio-indicators up to distances of 5-10 km from the plant in 16 major directions from the plant.

5. The Environment Protection Act should be amended to make it mandatory for populations residing in the vicinity of facilities regulated by pollution control boards to receive training, to allow them to monitor the compliance of consent conditions applicable to these facilities.
6. The cost of externalities must be reflected in the price of products and services; else, the cost of environmental injury will remain unaccounted for. The Government of India should set up an environmental economics commission to establish methods and norms for costing environmental costs, including those associated with thermal power plants.
7. Environmentally suitable sites for thermal power plants should be identified such as to cause minimum damage to the four areas (Western and Eastern Ghats, the Himalayas, and the North-east) which have low buffering capacity for acidic deposition. If the Government of India does not perform this task, a citizen's commission should undertake it.
8. Each industry must file a toxic release inventory (TRI) every year, with information on all toxic releases to air, water, soil and other sinks. The data will be compiled by the pollution control boards and made available in the public domain. On-demand information will then be available on emission quantities from a particular area or from an industry category.

In the **medium-term** (15 years), the following measures should be undertaken:

1. The government should draft and circulate a draft long-term policy paper on energy and environment. After public comment, a policy on this subject should be adopted by the Government of India.
2. A carbon and sulphur tax proportional to emissions should be imposed on all carbon and sulphur emitters. The sulphur tax should be used to mitigate any damage that acidic emissions may cause. The carbon tax should be used for the protection and conservation of forests and biodiversity in India.
3. The Male Declaration is a non-binding inter-government agreement which seeks to control and prevent air pollution and its likely trans-boundary effects in South Asia. The next step is for these eight countries (SAARC and Iran) to sign a binding protocol which puts a time-bound ceiling on emissions from each signatory country. Such protocols are in existence in Europe and North America. The monitoring of acidic deposition and their effects initiated by UNEP and South Asia Cooperative Environment Programme (SACEP) and other initiatives should provide valuable data to decide the ceilings for each country.
4. Except for particulate matter, thermal power plants do not have emissions standards for other pollutants. Emissions standards must be specified for SO₂ and NO₂, and subsequently for other pollutants. Any long-range impact that these pollutants may have on biodiversity must be considered while setting the standards.
5. The global trend is to shift away from solid and liquid fuels to cleaner gas fuels. In India too, gas-based power plants, which were non-existent earlier, today account for 14% of thermal power generation and 10% of total generation capacity. Gas availability will have to be increased either by importing gas or increasing gas exploration.
6. To meet the new emission standards, several technology options may be encouraged. Pre-combustion control methods include coal washing and the use of low sulphur liquid fuels. Treatment-during-combustion technologies include the addition of limestone and the use of low-NO_x burners. Post-combustion technologies include flue gas de-sulphurizers and non-catalytic reduction of NO_x by adding ammonia and urea to flue gases.
7. India has already commissioned several liquid or gas-based combined-cycle plants. These plants achieve efficiencies of 50% energy conversion, as compared to steam generators, which achieve a maximum efficiency of 35%. Combined-cycle plants should be further encouraged. If waste low-grade heat from power plants is used by other industries and by the domestic and commercial sectors, energy conversion efficiency would increase further.
8. There is considerable scope for introducing standards and using eco-labelling for low power-consuming end-use devices. Lighting accounts for 20% and 60% of use of power by the domestic and commercial sectors respectively. Refrigeration consumes 20% of the power consumed by the domestic sector. Electrical drives consume 73% and nearly 95% of the power consumed by the industry and agricultural sectors respectively. A switchover to more efficient devices just for lighting, refrigeration and drives can save considerable power.
9. The present Pollution Control Boards (PCBs) are geared to 'controlling' pollution and not preventing it. A new authority, Pollution Prevention Boards (PPBs), which are not limited like the PCBs, should be created to encourage the use of new low-polluting technologies both on the supply and the demand side; They could use financial incentives and disincentives, including sulphur and carbon taxes, to meet their objectives.
10. Efforts are already being made to reduce transmission and distribution losses. These must be pursued with vigour.

In the **long-term**, the only alternative is to phase out thermal power, and replace it with renewables, including what is being now seen as the energy source of the future, hydrogen.

Source: Thermal Power and Biodiversity Sub-thematic Review

7.1.7.4 Strategy: Integrate Biodiversity into the Mining Sector

Actions

(Adapted from *Mining and Biodiversity Sub-thematic Review*)

1. Take General Measures to Ensure that Mining is not Detrimental to Biodiversity

- i. **Long-term strategic land use planning and scheduling of lands:** A long-term land/water use plan needs to be developed, within which areas that are ecologically critical are clearly demarcated (see Section 7.0.1 for more details).
- ii. **Schedule of lands to be maintained by MoEF:** While the land/water use planning process is going on, MoEF should come up with a ready reckoner 'schedule of lands' for reference of all concerned – citizens, industry, investors etc. – as soon as possible. This 'schedule of lands' could be for various developmental projects, including mining. These schedules will include categories such as:
 - a. **'No-go' areas for mining:** These areas will be inviolate and no mining can be permitted under any circumstances. (The National Conservation Strategy recommends 'restriction on mining and quarrying activities in sensitive areas such as hill slopes, areas of natural springs, and areas rich in biological diversity.') No proposals for mining in these areas will be entertained by the MoEF. (**Note:** *There are already several areas which are meant to be inviolate, such as national parks and sanctuaries. But this list needs to be expanded to include hill slopes, catchment areas of rivers/lakes/reservoirs, biologically rich areas, important wildlife corridors, areas important for agro-biodiversity, sacred groves and community conserved areas, and other ecologically sensitive areas.*)
 - b. **Areas restricted for mining:** For this category, mining proposals will be allowed for a very restricted category of projects, to be specified by MoEF (akin to the current CRZ and some Ecologically Sensitive Areas already in operation).
 - c. **Areas where all proposals for mining can be submitted:** All nature of proposals can be submitted in these areas but will be subject to environmental clearance under the EIA notification.

Suggested Responsibility: Ministry of Environment and Forests, in association with national institutions and NGOs that have worked on identifying or mapping areas of critical biodiversity and ecological significance.

Time Frame: 1 year

- iii. **Environmental tax for mining:** There should be an environmental tax on the mineral extraction and production, which will go into a **Central Environmental Fund** (CEF). The tax will be decided according to the nature of the mineral, the extraction process, the impacts of the mineral on the environment throughout its life cycle, energy consumption in production, end use, region of extraction, etc.

Suggested Responsibility: Ministry of Mines, Ministry of Coal, Ministry of Finance, and Planning Commission.

Time Frame: 1 year

- iv. Targets for mineral resource use from the presently identified resources need to be set understanding the full environmental and social cost of mineral production throughout its life cycle and not merely based on the 'quantity' of mineral resource available. This will necessarily mean setting targets for 'reduced mineral use' and not just focus on improving efficiency of both the extraction process and material use.

Suggested Responsibility: Ministry of Environment and Forests, Ministry of Coal, Ministry of Mines, Planning Commission, Ministry of Power, along with related central and state level government and non-government academic and research institutions working on issues of material and mineral use. Collaborations could be made with international initiatives working towards 'dematerialisation' (reducing material use) such as the Factor 10 Club.

Time Frame: 3 years



- v. The Regional Offices of the MoEF should be empowered to use Section 4 A (1) & (2) of the Mines and Minerals (Development & Regulation) Act, 1957, to prematurely **terminate a prospecting or mining lease** on environment grounds.

Suggested Responsibility: Ministry of Mines, Ministry of Environment and Forests, Mineral Advisory Council

Time Frame: 6 months

- vi. The Central government to come up with a **livelihood rehabilitation policy**, strategy and action plan for mine labour which has been/ will be displaced from mining-based livelihoods. The policy, strategy and action plan will focus on supporting the labour to make a transition to sustainable and safe livelihood options.

Suggested Responsibility: Ministry of Mines, Ministry of Coal, Ministry of Labour, Ministry of Social Justice and Empowerment; labour unions, NGOs and research institutions working on issues related to labour and sustainable livelihoods.

Time Frame: 2 years

2. Enhance and expand the process of environmental clearances for mining projects

- i. All mining leases to require environmental clearance under the EIA notification, irrespective of size of lease or nature of mineral. The MoEF to set up more regional offices with greater jurisdiction to facilitate environmental clearance for all mining leases. There will be advisory committees at the regional office level constituting ecologists, sociologists, local community members, government officials, representatives of local institutions.

Suggested Responsibility: Ministry of Environment and Forests, with relevant national and local NGOs, institutions, and community representatives on the advisory committees.

Time Frame: 1 year

- ii. In the provision for 'site clearance' under the EIA notification, the following should be added: 'It is clarified that grant of site clearance only gives permission to conduct investigation and survey for preparation of pre-feasibility report and would not *ipso facto* imply any commitment on the part of the Impact Assessment Agency to grant environmental clearance.'

(Note: This clarification is necessary because for site-specific projects, such as mining, there is an assumption that if site clearance is granted then environmental clearance is inevitable. There has been great pressure on the MOEF both from mining and political interests to give final clearance to these projects saying that 'if the site was cleared, then why is the project being held up?')

Suggested Responsibility: Ministry of Environment and Forests

Time Frame: 6 months

- iii. Comprehensive Environmental Impact Assessment studies need to be undertaken for cluster mines to see their cumulative impacts on the environment and biodiversity. This study should be undertaken by the respective Regional Office of the MoEF and be funded through the CEF. New mining leases in such areas should only be granted looking at the carrying capacity of the area and the EIA.

Suggested Responsibility: Ministry of Environment and Forests including its regional offices, along with academic and research institutions with necessary expertise for conducting various aspects of EIA at central and regional levels, and the Ministry of Mines.





Time Frame: 2 years

- iv. Applications for environmental clearance (and forest clearance) of mining projects should be accompanied by the following additional information: list of existing mining leases of the lessee/company across the country or the world; level of production; information and details on whether the lessee has been booked for violation of any environmental norms; information on the nature of mining activities already in progress in the region proposed for mining.

Suggested Responsibility: Ministry of Environment and Forests

Time Frame: 6 months

- v. Public hearings need to be held for all mining projects irrespective of size of lease or nature of mineral (major or minor).

Suggested Responsibility: Ministry of Environment and Forests, with help from district administration and local NGOs at the specific proposed mining sites.

Time Frame: 3 months

3. Enhance and Expand the Process of Clearance of Mining Projects Under the Forest (Conservation) Act, 1980

- i. Cost-benefit analysis under the FCA should be done for all mining projects irrespective of the nature of mineral or size of lease.

Justification: Presently this is required only for projects above 20 ha in the plains and above 5 ha in the hills. This is very important, as smaller leases can be very damaging to the environment and often harbour crucial biodiversity values. For example, a coal-mining lease of 4.95 ha has caused damage to the rainforests in the Namchik-Namphuk RF of Arunachal Pradesh, just 15 km from Namdapha NP. The project proponent asked for a lease less than 5 ha to avoid environmental clearance under the EIA notification and was also not subject to cost-benefit analysis under the FCA, as the area was less than 5 ha.

Suggested Responsibility: Ministry of Environment and Forests

Time Frame: 3 months

- ii. The directives of the MoEF in letter No.11-30/96-FC(Pt.) dated 26.02.99 (see Box 7.1.7.4), asking for all proposals under FCA to be 'accompanied by a resolution of the "Aam Sabha" of Gram Panchayat/Local Body of the area endorsing the proposal that the project is in the interest of people living in and around the proposed forest land' should be enforced strictly for all mining leases.

Box 7.1.7.4 Involving Local People in Deciding about Development Projects

Letter No. 11-30/96-FC (Pt.) issued by MoEF to Chief Secretaries of each State asserts in point 5. 'It has been observed that in respect of a large number of proposals the Central Government is receiving representation from NGOs/local public bodies against the diversion of forest land on loss of forest land, environment and ecological grounds. Therefore, the Central Government feels that it is essential to have the opinion of the local people whenever a project is coming up in that area. Therefore, it has been decided that whenever any proposal for diversion of forest land is submitted, it should be accompanied by a resolution of the "aam sabha" of gram panchayat/Local Body of the area endorsing the proposal that the project is in the interest of people living in and around the proposed forest land.'

Suggested Responsibility: Ministry of Environment and Forests (through its regional offices), and State Forest departments (through Nodal Officer who handles forest clearance at state level).

Time Frame: Within 3 months of mining proposal being made available to affected and concerned communities.

- iii. Public hearings to be made compulsory for all mining projects being considered for clearance under the FCA. Separate hearings will not be required if all mining projects require a public hearing under the EIA notification as recommended.

Suggested Responsibility: Ministry of Environment and Forests

Time Frame: 3 months

4. Ensure ecologically Sensitive Restoration and Mine Closure

Restore, as far as possible to the original land-use and ecosystems, lands that have been mined out. Such restoration should follow ecological principles, use only locally indigenous species, and fully involve and benefit local communities. The programme is to be undertaken at the cost of the mining party. The use of micro-organisms to restore soil health should be emphasised.

Justification: Substantial amounts of land in India have been degraded by open-cast mining, with little attempt at regeneration or restoration. As the *Mining and Biodiversity Sub-thematic Review* points out:

- In India the approach to restoration of mines and mine wastes is very engineering- and technology-based; ecology and biodiversity seldom get priority...stress is given on physical interventions rather than biological interventions. In some instances it was also observed that the mine companies leave abandoned open-cast mines without any action towards restoration or remediation action.
- The biological interventions for ecological amelioration are often plantation, afforestation or reforestation programmes. Very often studies or reports on such programmes place emphasis on number of trees planted... however, few studies focus on ecological and biodiversity issues...Owing to such a myopic approach, natural forests and ecosystems are often lost.
- There are very few studies available in India that are comprehensive and encompass varied issues such as ecological functions (soil nutrients, organic carbon, soil moisture, ground water), ecological structures (biological diversity of plants and animals, wildlife habitat potential, natural communities), preferences of local communities, etc. Such an approach not only brings success but also ensures long-term sustainability of the restoration site.
- There are no performance standards to monitor success of reclamation programmes. Such standards are required where mining has taken place close to protected areas or wilderness areas such as wildlife corridors. Due to the absence of performance standards, there are no evaluation and monitoring protocols. This situation has proved to be a boon for defaulters; especially the mine companies, which do not undertake reclamation or restoration of the abandoned mine sites.



Suggested Responsibility: MoEF for preparing a manual and enforcing its provisions; Ministry of Mines, mining companies and relevant state government departments along with local communities, for reclamation.

Time Frame: One year for preparation of manual; 5 years to initiate the work in all existing mined-out areas; ongoing for new mines.

Steps

(adapted from *Mining and Biodiversity Sub-thematic Review*)

- i. MoEF to bring out a detailed Manual on 'Ecological amelioration practices for mine areas'. This will include:
 - a. Clear definitions and differentiation between various terms such as restoration, rehabilitation, reclamation, remediation, reforestation, plantation etc., which are often used interchangeably in environmental, and forest- and mining-related laws and policies.
 - b. Guidelines as to the nature of amelioration inputs (restoration, reclamation etc.) required, according to the concerned mineral, the extraction process, location of mine etc.

- c. Performance standards for the reclamation programmes according to a range of site-specific requirements.
- d. Monitoring protocols to measure the performance of reclamation projects.
- e. Case studies on best practices from around the world.

Suggested Responsibility: Ministry of Environment and Forests, in collaboration with Forest Research Institute, Indian Bureau of Mines, Centre for Mining Environment, Indian School of Mines, State Forest Research Institutes National Environment Engineering Research Institute (NEERI), Bombay Natural History Society, Wildlife Institute of India (WII), Society of Ecological Restoration, Ecological Society, Central Mining Research Institute, and others.

Time Frame: 2 years

- ii. MoEF to issue b), c) and d) of Step (i) above under the EPA. This will be a standard which should be adopted by other environmental and mining legislations.

Suggested Responsibility: Ministry of Environment and Forests

Time Frame: 6 months after completion of manual mentioned in Step (i) above

- iii. Maximum possible ecological restoration of areas already mined in ecologically sensitive areas need to be taken up as a priority.

Suggested Responsibility: Ministry of Environment and Forests regional offices, State Forest Departments, State department for Mining and Geology, mining companies.

Time Frame: 6 months for identification of priority areas for restoration. Begin implementation within 6 months of identification, after getting necessary financial and other resources in place.

- iv. Project proponents should be required to submit detailed Mine Closure Plans before the start of the project. These will be subject to review at regular intervals by the Regional Offices of the MoEF.

Suggested Responsibility: Ministry of Environment and Forests, Ministry of Mines, Indian Bureau of Mines, Mineral Advisory Council; labour unions; representatives of local communities living around mining site.

Time Frame: 1 year to issue guidelines for Mine Closure. 6 months after this for all mining companies to submit closure plans as per guidelines.

- v. Performance bonds should be used to ensure that funds will be available to mitigate any potential environmental or social damages.

Performance bonds are an effective financial tool for encouraging good practices. A performance bond is a financial assurance deposited by the mining company with the Government. The bond provides an additional guarantee, over and above any traditional insurance policies, that funds will be available to mitigate or correct any potential environmental social or environmental damages. Bonds also ensure that money will be available for reclamation of a site in case a company abandons a mine or goes bankrupt before reclamation is complete.

Suggested Responsibility: Ministry of Mines, Ministry of Environment and Forests, State Department for Mining and Geology, State Forest Department, Indian Bureau of Mines.

Time Frame: 8 months to issue draft guidelines for performance bonds. 6 months after this to circulate draft guidelines for comments and official notify them after incorporating inputs from people.

- vi. For a section of mines being exploited by small investors, *panchayats*, cluster mine areas etc. the restoration of the mines will be done by the Forest Department of the respective State with funds from the CEF. The MoEF will lay down guidelines to categorise the mines which will be eligible for rehabilitation by government, but a mine will become eligible for restoration by the government only after certification from the Regional Office of the MoEF while processing the applications for environmental/forest clearance before commencement of mining operations.

Suggested Responsibility: Ministry of Environment and Forests regional offices, Ministry of Mines, Ministry of Social Justice and Empowerment at Central level; State Departments for Mining and Geology, Forests and Environment; and the Indian Bureau of Mines.

Time Frame: 6 months for categorization guidelines, 6 months to carry out the categorization of all the mines to find out which are eligible for rehabilitation by the State; rehabilitation to begin within a period of six months of completion of categorization.

7.1.7.5 Strategy: Ensure Integration of Biodiversity Concerns in International Relations

Actions

1. Ensure that all External Aid to India Integrates Biodiversity Concerns

Integrate biodiversity and biodiversity-based livelihoods as a central concern in all ongoing and future external-ly-aided projects and processes, including bilateral and multilateral aid for specific development projects, sectoral funding, and funding for structural and macro-economic changes.

Justification: A substantial amount of external aid (grants and loans) that comes to India is not sensitive to biodiversity concerns, nor does it have in-built mechanisms of assessing impacts on the environment or on biodiversity-based livelihoods. Many development- and welfare-related aid projects and processes end up destroying biodiversity or disrupting biodiversity-based livelihoods. This includes even explicitly environment-oriented projects, such as many of the state forestry projects. Regardless of whether donors normally have such concerns built into their policies, India needs to insist on such integration.

Suggested Responsibility: Collaborative process among Ministry of Environment and Forests, Ministry of External Affairs, Department of Economic Affairs, and Planning Commission; and involving independent environmental and social action groups.

Time Frame: Guidelines within one year; then ongoing as and when external aid projects and processes are negotiated.

Steps:

- i. Set up a committee within the Ministry of Environment and Forests, jointly constituted with Ministry of External Affairs and Department of Economic Affairs, to draft guidelines for such integration, and for screening all such proposals; the committee must have a substantial number of non-governmental members from environmental and social action groups and community organisations;
- ii. Set up procedures in all states to ensure that communities and people who are to be affected by proposed external aid, are involved from the outset in determining the desirability, direction and quantum of aid needed, and thereafter in implementation and monitoring, and ensuring the governance procedures laid out in Section 7.0.2 are followed;
- iii. Pursue, at relevant international forums, including through the use of appropriate provisions in the Convention on Biological Diversity and relevant agreements of the WTO, the establishment of parallel procedures to ensure that aid-giving countries and entities also build in biodiversity and livelihood concerns into their policies and programmes;
- iv. Pursue the above concerns bilaterally with bilateral aid agencies.



2. Ensure that all Foreign Investment in India Integrates Biodiversity Concerns

Integrate biodiversity and biodiversity-based livelihoods as a central concern in all ongoing and future foreign investment in India, including FDI by corporate bodies.

Justification: (as in the case of *Action 1* above)

Suggested Responsibility: As in *Action 1* above, but with the involvement of relevant industry associations including ASSOCHAM, FICCI, etc.

Time Frame: As in *Action 1* above.

Steps:

As in *Action 1* above, with the additional provision that the committee that is constituted should include members of the industry associations

3. Ensure that All Bilateral and Multi-Lateral Agreements, Which India Enters into, Integrate Biodiversity Concerns

Integrate biodiversity and biodiversity-based livelihoods as a central concern in all ongoing and future international agreements that India enters into, including bilateral and multilateral agreements, other than the specific aid projects and processes covered in *Action 1* above (see also *Sections 7.1.11 and 7.2.11*). This would include forums such as SAARC.

(Responsibility, Time frame and Steps as in *Action 1* above.)

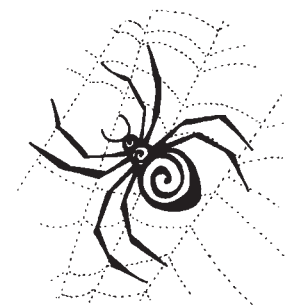
7.1.8 Wild Biodiversity: Strategies and Actions for Policy and Legal Measures

The strategies and actions in this section are oriented towards (a) strengthening the implementation of existing legal/policy measures; (b) amending and changing existing laws/policies as appropriate (including where they do not have a sound scientific or social base); (c) suggesting new laws/policies where necessary; and (d) reconciling various laws/policies that are actually or potentially contradictory. These recommendations emerge from the earlier analysis of current legal and policy initiatives and the gaps in them (see *Chapter 5 and 6*), and should also be read in conjunction with the actions suggested in other parts of this chapter, especially *Sections 7.1.2, 7.1.5, and 7.1.7*.

This chapter should also be read in conjunction with the *Laws, Policies, Institutions, and Planning for Biodiversity Thematic BSAP*. Several of the environmental laws have been analysed in much greater detail in that document, including specific clause-wise recommendations.

Overall strategies:

1. **Strengthen the orientation of existing policies towards biodiversity, and formulate new policies regarding major gaps**, including for wetlands, marine areas, national land/water use and urban environment;
2. **Strengthen the orientation of existing laws towards biodiversity, and formulate new laws or rules regarding major gaps**, including for wetlands, marine areas, urban natural heritage and traditional knowledge;
3. **Orient *panchayat* laws** and their implementation towards biodiversity conservation, sustainable use and equity issues;
4. **Provide encouragement and authority to relevant customary laws/practices**, and reconcile them with statutory laws, encouraging traditional modes of dispute resolution;
5. **Strengthen mechanisms of implementation of relevant laws**, including through stronger *locus standi* to citizens, and greater access, especially to biodiversity-dependent communities;
6. **Ensure public right to all biodiversity-related information** (except what is covered under traditional knowledge protection), and utilise the Freedom of Information Act to gain convenient public access;
7. **Reconcile contradictions between (a) development and biodiversity-related laws, (b) decentralisation and biodiversity-related laws, and (c) central and state laws;**



8. **Assess judge-made law**, including relevant court orders, to use them more effectively for biodiversity-related causes.

7.1.8.1 Strategy: Integrate Biodiversity into Existing Policies

Overall Justification: The discussion in Chapters 5 and 6 clearly indicates that some of the existing policies in the country, which have a bearing on wild biodiversity and the livelihoods related to it (either directly or indirectly), need to be reviewed and modified to integrate biodiversity concerns.

Actions

1. Review And amend National and State-Level Policies to Integrate Biodiversity

Review existing national- and state-level policies and policy statements, from the point of view of biodiversity concerns, and modify them as necessary and appropriate. In the case of policies reviewed under NBSAP, introduce the changes that are suggested in the tables and boxes in this section. In particular, the review and modification should ensure the plugging of loopholes that allow destructive 'development' projects and processes to be cleared, and should provide maximum possible coverage to biologically diverse and unique regions, threatened and endemic taxa, and biodiversity-based livelihoods and rights. They should also ensure that the commercial and industrial uses of biological resources, such as medicinal plants, are demonstrably sustainable.

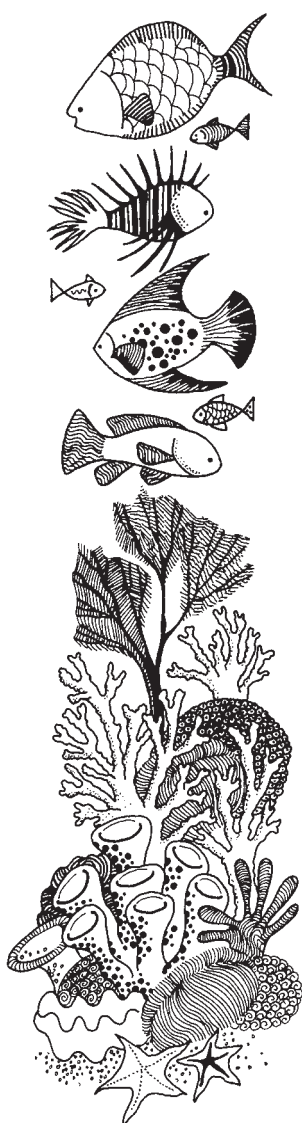
Justification: There are significant gaps in many of the relevant policies (including those mentioned below under Steps), some of which have been pointed out in *Sections 5.2.6 and 6.1 (especially Section 6.1.5.3)*. These gaps need to be plugged, to enable the policies to more effectively aid in biodiversity conservation, sustainable use, and equity.

Suggested Responsibility: MoEF, Ministry of Tourism, Ministry of Industry and Commerce, MoRD, Ministry of Agriculture, Department of Biotechnology, Department of Ocean Development, Department of Economic Affairs, along with the Ministry of Law, and with the central involvement of community institutions, NGOs and independent policy and legal experts.

Time Frame: 5 years

Steps:

- i. Review, from the point of view of biodiversity and biodiversity-related livelihoods, the following policies: Forest Policy, 1988 (see *Table 7.2* for some specific points); National Water Policy, 2002; National Mineral Policy, 1993; Ocean Policy Statement, 1982 (see *Box 7.1.8.1*); Science and Technology Policy, 2003 (see *Box 7.1.8.3*); various macro-economic policies including Export-Import, investment-related, and others under the overall umbrella of New Economic Policies introduced after 1991; Tourism Policy; Industrial Policy; and any other relevant policy which may be identified/prioritized.
- ii. Initiate comprehensive sectoral reforms, specifically in the case of forests and revenue administration (see *Box 7.1.8.2* below).
- iii. Follow these reviews and analyses by introducing the corresponding changes to the said policies; in the case of the policies already assessed under the NBSAP and mentioned above, or mentioned in various parts of Chapter 7, the process of introducing such changes to begin immediately;
- iv. Respective state governments to review and modify policies pertaining to the above-mentioned spheres and any other policies which have a bearing on aspects of wild biodiversity, and which have been enunciated by a particular state government, based on issues raised in the relevant BSAPs; here too, the review and analysis process would have to be followed by governments moving to modify the existing policies;
- v. Review and modify the Central Government's JFM Circular, 1990, and all the State Government JFM orders that have been made pursuant to this circular, based on issues that have emerged from BSAP consultations as reflected in the relevant action plans, and based on the gaps and weaknesses identified in *Section 6.1.5.2* and actions identified in *Section 7.1.5.3, Action 1*.



Box 7.1.8.1 The Ocean Policy Statement, 1982: Gaps and Strategies

(See also Strategy 7.1.8.2, Action 2)

Gap: According to Paragraph 6, the 'main thrust should be on the optimal utilisation of living resources...exploitation of non-living resources...harnessing of renewable resources of ocean energy...and the collection and processing of polymetallic nodules from the deep sea'. The conservation of marine diversity is not explicitly mandated, although Paragraph 7 mentions that 'technological advances have to be geared to the utilisation and preservation of the marine environment.'

Strategy: The focus needs to shift from utilization and exploitation to conservation. As of now, EIAs related to deep-sea mining only study how deep-water nutrients are affected. Such processes should be bound by detailed assessments of their impact on biodiversity, and binding restrictions should be imposed.

Gap: While stating the need to prepare inventories of marine diversity, there is only a mention, under Paragraph 5, of the need to inventorise *commercially exploitable fauna and to map and assess the availability of minerals from the deep sea*. Such inventories, though necessary, are geared only towards exploitation.

Strategy: The statement should call for the making of inventories based not only on commercial exploitation, but also based on parameters of conservation and sustainable use.

Gap: The Policy points out that more needs to be done for the development of 'indigenous technology for the exploitation of fish from deeper waters', including setting up of infrastructure facilities and services to operate large-sized fishing vessels. Given that large vessels are often only within the reach of the wealthier fisherfolk or outside agencies, this raises questions regarding who the beneficiaries of these technologies would be.

Strategy: A clarification needs to be made regarding the beneficiaries of such technological development, with a clear priority given to traditional small-scale fisherfolk (see also *Strategies 7.1.4.2 Action 3, 7.1.5.1 Action 1, and 7.1.5.5*).

Box 7.1.8.2 Forest Sector Reforms as Part of Forest Policy and Laws

It is imperative that forests are conserved and managed on sound ecological grounds, with due emphasis on social justice and equity. Forest sector reforms need to be built into policy and law, to enable recognition of the multiple values and functions of forests, particularly their role in conserving biodiversity (including threatened species), and in supporting diverse livelihood systems. The old categories of reserve, protected and other forests need to be reviewed from these points of view. As discussed elsewhere in this report, the legal category of 'forest' lands does not at present necessarily reflect either forest quality and biodiversity or livelihood dependence. Such reforms need to provide a legitimate voice to the vast number of women and men of local communities, dependent on biodiverse forest resources for their livelihoods, cultural identity and survival.

This also requires a fresh look at current forestry institutions, including various facets of human resource development such as recruitment, training curricula, democratisation across vertical hierarchies, coordination amongst horizontal divisions. The very role of the Forest Department needs review, with an emphasis on its transformation from being predominantly a regulator to an effective facilitator, supporting communities in discharging their rights and responsibilities.

The Forest Commission, set up in 2003, would be an appropriate forum to discuss these reforms, with widespread consultation across the country and especially amongst forest-dwelling and dependent communities, community forestry institutions, forestry personnel across the hierarchy, various developmental departments of the government, NGOs, and industry. The Forest Sector review carried out in Himachal Pradesh could be a useful example to learn from, for similar reviews in each state and at the centre.

(See also specific recommendations regarding the Forest Policy, the Indian Forest Act, and the Forest Conservation Act, in the *Laws, Policies, Institutions, and Planning Thematic BSAP*, and in *Table 7.2*)

Box 7.1.8.3 Science and Technology Policy 2003

(see Section 6.1.8.2)

Review, and incorporate the following key elements into the National Science and Technology Policy, 2003, and its implementation:

1. Provide explicit recognition of indigenous/traditional knowledge as being a valid form of S&T, rather than promote the separation of S&T from such knowledge;
2. Provide a clear role for holders of indigenous/traditional knowledge in the development and dissemination of S&T;
3. Promote the collective, informal nature of traditional S&T, including community and collective forms of intellectual property or rights (see Section 7.1.5.4).
4. Ensure full transparency and the public right to information relating to new developments in S&T, including those of public concern such as genetic engineering and nuclear technologies.

Justification: Though containing some progressive language relating to traditional knowledge and the environment, the S&T Policy needs to provide a more central role to the above aspects.

Suggested Responsibility: Ministry of Science and Technology, Ministry of Tribal Affairs, MoEF, along with relevant S&T-related institutions and NGOs, and movements/NGOs working on traditional knowledge and traditional S&T.

2. Reconcile Laws and Policies which are Incompatible with Each Other and with Principles of Conservation, Sustainable Use, and Equity

Overall Justification: Several policies and laws in the country are in contradiction to each other, and this tends to often undermine effective implementation of provisions on conservation, sustainable use and equity. Some of the actions proposed in Section 7.1.7 would need to be utilised in order to achieve this.

Steps:

- i. Prepare a complete listing of national policies and laws that are incompatible with principles of conservation, sustainable use and equity. This could be built on those already identified in Chapters 5 and 6 and various parts of Chapter 7 in this report, and those identified in the *Laws, Policies, Institutions, and Planning BSAP* or other site-based BSAPs. A similar state-wise list of policies and laws to be made, building on those identified in sub-state, state, and ecoregional BSAPs.

Each of the documents listed as per the above list to be scrutinized by teams of lawyers along with relevant experts, including those who could provide insights from various NBSAP consultations at the national, state and local levels. This should include contradictions between national and state laws.

- ii. Resolve contradictions between conservation, decentralized governance and social justice laws. The national laws related to land, water and forests are often contradictory to the provisions for people's control over their local resources mandated by the 73rd and 74th constitutional amendments; this is especially the case for Schedule V & VI areas. Defining clear boundaries for applicability of the central laws or amending them is required to enable genuine democratic decentralization in other areas. Also needed is a systematic review of Supreme Court judgements related to interpretations of the IFA, FCA and the WLPA for such areas, and to find remedies for the way in which they have at times violated the decentralization laws and constitutional provisions. This can be done through the following measures:

- a. Set up an empowered committee with membership of constitutional and human/tribal rights experts, experts in environmental and biodiversity conservation, experts in participatory governance, and respected tribal and indigenous leaders from Schedule V and VI areas to:
 - Conduct public hearings in representative regions, ensuring the maximum participation of local people and in particular women and other underprivileged sections; prior to these hearings, disseminate information on the relevant laws in local languages;



- Make concrete recommendations, based on this section and other inputs, for weeding out contradictions between the IFA, WLPA, EPA and several Supreme Court judgements on the one hand, and decentralization provisions of the constitutional amendments and relevant laws including PESA;
 - Clearly define the common pool land, water, forest, and marine resources which must be under the jurisdiction of PRIs and *gram sabhas*, and traditional institutions in North-Eastern states, and on which the concerned departments (Forest, Wildlife, Irrigation, Public Health, Revenue, etc.) must play a facilitating role, working only through, and in collaboration with, local institutions;
 - Make recommendations for a set of responsibilities relating to conservation, sustainable use, and equity, which *gram sabhas* and communities in general need to fulfill.
- b. Bring in the necessary amendments in the identified laws to enable the above.



Suggested Responsibility: MoRD, MoTA, MoL, Ministry of Social Justice and Empowerment, MoEF, associations of tribal/indigenous people, human rights and environment advocates, and social activists.

Time Frame: 2 year for full report; 3 years to make necessary amendments or rules.

- iii. Resolve contradictions between national and state laws: State laws to be reviewed from the point of view of contradictions with the national framework on biodiversity conservation, sustainable use and equity, as set out by the NBSAP and the Biological Diversity Act.

Several state level laws may either contradict the national framework on biodiversity, or fall far short of the required standards. Some states, for instance, have excluded certain NTFP from being given over to local communities, as required by the Panchayat (Extension of Scheduled Areas) Act; some have weaker provisions for wildlife conservation, some have extremely weak or no provisions for conserving urban biodiversity, etc. Conversely, some states have gone beyond the intent and letter of the central law or policy, e.g. Madhya Pradesh in extending the provisions of the Panchayat (Extension of Scheduled Areas) Act to non-Scheduled Areas as well. These contradictions and weaknesses, or elements of mismatch, need to be removed.

The methods used could be similar to those for (ii) above, with appropriate modifications for state-level action.

Suggested Responsibility: State-level expert teams, set up under the overall responsibility as per Step (ii) above.

Time Frame: 2 years for full report; 3 years to make necessary amendments or rules.

Table 7.2 Gaps and Strategies Relating to Forest Policies and Laws

Forest Policy 1988	
Key Gaps	Strategies
<p>1. The fifth basic objective points towards afforestation programmes on denuded, degraded and unproductive lands. One of the priority areas for research under sub-heading 4.12 is 'revegetation of barren/marginal/waste/mined lands and watershed areas. 'Sub-heading 4.2.3 states, 'Village and community lands, including those on foreshores and environs of tanks, not required for other productive uses, should be taken up for the development of tree crops and fodder resources...' In all these cases, there is no safeguard against the planting of trees on lands</p>	<p>1. It needs to be clarified that all afforestation programmes, especially on denuded and degraded lands, should include a diversity of indigenous local flora, and should not change the natural character of the ecosystem. The concepts of 'wastelands' and 'unproductive' lands need to be reviewed (see Strategy 7.1.2.7).</p>

Key Gaps	Strategies
<p>that have other kinds of natural ecosystems, such as grasslands. Such plantation has caused serious loss of non-forest ecosystems, with adverse impacts on biodiversity and on local livelihoods.</p>	
<p>2. Sub-heading 4.7 states that areas damaged by shifting cultivation should be rehabilitated through social forestry and energy plantations. Shifting cultivation forms the basic livelihood of many communities in the country, which is severely impacted when steps like this are taken. Improved agricultural practices are also recommended by the policy, without defining what 'improved' should mean.</p>	<p>2. Area/state-specific strategies need to be employed regarding shifting cultivation, focusing as far as feasible on practices that help retain its basic character, while regaining sustainability. A clarification needs to be made regarding the meaning of 'improved' agriculture, ensuring that this leads to organic farming that maintains or enhances biodiversity (<i>see Strategies 7.2.4.3 and 7.2.9.3</i>).</p>
<p>3. Sub-heading 4.8.3 says that 'adequate grazing fees should be levied to discourage people in forest areas from maintaining large herds of non-essential livestock.' While regulations regarding grazing are essential, the lack of a definition of 'non-essential' livestock is often misinterpreted to mean those that are economically less productive, whereas livestock may be 'essential' for communities from many other points of view. This also sometimes causes loss of indigenous breeds of livestock, and hence domesticated biodiversity.</p>	<p>3. This needs to change to a more nuanced approach depending on site-specific circumstances, including biological carrying capacity, taking into account the ecosystem and the kinds of livestock, the uses of the livestock, the presence of indigenous breeds, and so so on (<i>see Strategy 7.2.8.2</i>).</p>
<p>4. The seventh basic objective recommends increasing the productivity of forests to meet essential national needs. The term 'national need' can be misused for over-exploitation and diversion of forest resources, while the survival and livelihood rights of local people are not respected.</p>	<p>4. The Policy, while talking of national needs, should indicate stakeholder priorities, emphasizing, in particular, conservation and local community rights/needs.</p>
<p>5. The Policy does not explicitly recognise the special needs and relationships of women to forests. In fact, the use of the term manpower under sub-heading 4.11 (Forestry Education) presents a gender-insensitive usage.</p>	<p>5. Gender aspects need to be much more strongly built into the Policy (<i>see Strategy 7.1.5.3</i>).</p>
<p>Indian Forest Act, 1927 (IFA)</p>	
<p>1. The IFA was intended to consolidate the law relating to forests, the transit of forest-produce, and the duty leviable on timber and other forest produce. This was essentially an Act providing for the use of forest resources by the British Government, and has not been substantially amended since Independence. In fact, the only changes made after Independence have been in the form of The Adaptation of Laws Orders, 1950 and 1956.</p>	<p>1. The IFA needs to be amended to enable stronger provisions on biodiversity (and not just forest cover) conservation, ensuring the livelihoods of traditional forest-dependent communities, and providing a central decision-making role to such communities (<i>see Strategy 7.1.8.3</i>).</p>

Key Gaps	Strategies
2. The declaration of 'wastelands' (often common property lands) as Reserved and Protected Forests is problematic from the biodiversity and local livelihood points of view.	2. The significance of lands called 'wastelands', from the point of view of biodiversity and livelihood, should be recognised, and an appropriately sensitive definition needs to be included in the statute (<i>see Strategy 7.1.2.7</i>).
3. The term 'forest produce' has been a subject of constant interpretation by the Courts.	3. The definition needs to be finalised based on consultation with various sectors (particularly forest-dwellers), leading to an examination of existing guidelines and practices pertaining to 'forest produce'.
4. Under Chapter II, provisions related to the settlement of rights are complicated and at times unclear from the point of view of traditional forest-dependent communities. Furthermore, the process is not participatory, leaves room for arbitrary action on the part of settlement officers, and at times results in conflicts between different government departments.	4. The settlement procedure needs to be simplified and made more participatory. Where the procedure is difficult to simplify further, the statute needs to include provisions for free legal aid to affected persons.
5. Chapter III, which deals with Village Forests, assigns State Governments the right to make rules for regulating the management of such forests.	5. In view of the Constitutional amendments relating to Panchayats, Gram Sabhas should be given the appropriate rights for managing village forests, building on customary laws/practices (<i>see Strategy 7.1.8.5</i>).
Forest Conservation Act, 1980	
1. A lot of debate has been generated over the definition of 'forest', as neither this Act nor the Indian Forest Act 1927 provide one. While throwing light on the meaning of 'forest' in the context of the Forest (Conservation) Act, 1980, the Supreme Court held that the word 'forest' must be understood according to its dictionary meaning. This has on the one hand helped to stave off destructive threats to forests, but has on the other hand adversely affected a large number of forest-dependent communities.	1. A broad definition, capable of site-specific application, needs to be incorporated after consultation with various stakeholders, in particular ecologists and traditional forest-dwelling communities.

7.1.8.2 Strategy: Formulate New Policies for Aspects that have so far not been Dealt with at a Policy Level

Overall Justification: Amendments and modifications in the existing policies are only one step towards achieving an overall policy framework which is sensitive to both biodiversity conservation and people's livelihood security. There is also a need to formulate new policies for areas and subjects which have so far been ignored within the overall framework, or where amendments to existing policies would be inadequate.

Actions

1. Formulate a Wetlands Policy

(along with relevant law, *see Strategy 7.1.8.4, Action 1*)

Formulate, through a process of extensive consultation, a National Policy on Conservation and Sustainable Use

of Wetlands, keeping in mind the links with existing policies on conservation and wildlife. This policy should deal with conservation of the freshwater wetland ecosystems and their constituent species diversity, with the sustainable use of their resources, and with issues of equity arising in conservation and sustainable use.

Justification: Efforts towards the conservation of sensitive ecosystems like freshwater wetlands need to be backed up with substantial legal and policy frameworks. As of now there are no specific policies for the conservation and sustainable use of these ecosystems. While policy-like statements and plans such as the National Conservation Strategy and the National Wildlife Action Plan, designation of wetlands as Ramsar Sites, and legislation related to environment and wildlife do provide some coverage to such ecosystems, these are far from adequate. Hence the need for a comprehensive policy on these neglected ecosystems.

Suggested Responsibility: Ministry of Environment and Forests along with the State Governments, with Wildlife Institute of India, SACON, BNHS, other such institutions, and with the central involvement of community institutions and NGOs.

Time Frame: 3 Years

Steps:

- i. MoEF to set up an expert working group on wetlands, to draft a policy; this group should consist of wetland scientists, wildlife specialists, members of fisherfolk and other wetland user groups, and officials from relevant ministries and departments;
- ii. Conduct public hearings and consultations in several relevant places in the country, ensuring especially the participation of wetland-dependent communities;
- iii. Assess, for use in the drafting, existing proposals including the proposed wetlands policy drafted at the WII; assess also ongoing successful initiatives on wetland conservation and sustainable use for lessons that can be incorporated into the policy;
- iv. Circulate the draft policy widely for comments;
- v. Finalise and pass the policy, and set up participatory mechanisms to implement it, including related legislation (see Section 7.1.8.4).

The above steps could be linked to the Wetland Conservation Programme of the MoEF.

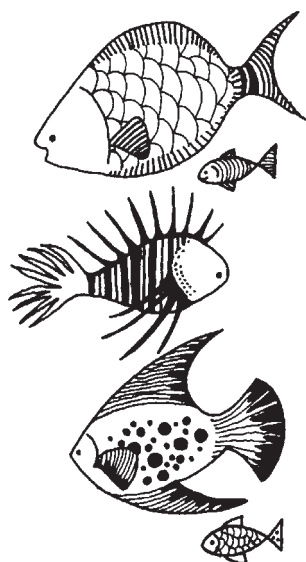
2. Formulate a Marine Areas Policy

(along with relevant law, see Section 7.1.8.4, Action 2)

Formulate, through a process of extensive consultation, a National Policy on Conservation and Sustainable Use of Marine Areas, keeping in mind the links with existing policies on conservation and wildlife. This policy should deal with conservation of marine ecosystems and their constituent species diversity, with the sustainable use of their resources, with tenurial rights issues for traditional fisherfolk communities, and with issues of equity arising in conservation and sustainable use.

Justification: Efforts towards the conservation and sustainable use of marine ecosystems have been haphazard and seriously inadequate, one reason for which is the absence of a clear policy. While policy-like statements and plans such as the National Conservation Strategy and the National Wildlife Action Plan, as also legislation related to environment and wildlife, do provide some coverage to such ecosystems, these are far from adequate. Also neglected in policy are issues of traditional community rights to marine resources. Hence the need for a comprehensive policy on these neglected ecosystems and communities.

Suggested Responsibility: Department of Ocean Development, MoEF, along with the State Governments, in collaboration with the Wildlife Institute of India, SACON, BNHS and other such institutions, and the central involvement of fishworkers organisations such as the National Fishworkers Forum and the International Collective in Support of Fishworkers, community institutions and NGOs, and academics from institutes such as the National Institute of Oceanography, National Institute of Ocean Technology, and Centre for Development Studies.



Time frame: 3 years.

Steps:

As in *Action 1* above, with necessary modifications; also build in learning from existing and proposed policy measures such as those of Kerala; see *Box 7.1.8.4*.

Box 7.1.8.4 Policy for Marine Fisherfolk in Kerala

The proposed policy for marine fisherfolk, under consideration of the Kerala State Government as of early 2003, provides for the following:

'Objectives: This policy is meant for the traditional fisherpeople and the allied workers-particularly those who are backward among them who are depending on fishing for their livelihood, their security, and whose rights need to be protected. The traditional fisherpeople are defined as follows: Traditional fisherpeople are both men and women who depend on fishing for their livelihood and those who are from the same families doing allied work.'

'In order to sustain and develop inland fisheries of all waterbodies and the nearby mangroves, by maintaining the right to fish to the traditional fisherpeople, these waterbodies will be declared as Protected Fisheries Areas....'

'The right to own the fishing implements and the right to have fishing licence is limited to owner operators only...'

'In order to free the traditional fisherpeople from the clutches of the middlemen, the fisherpeople's right for first sale will be legislated, and this sale will be done through fisherpeople's co-operatives.'

Source: Thomas Kocherry, personal communication (free translation from the Malayalam original) 2003.

3. Formulate a National Urban Environment Policy

Formulate, through a process of extensive consultation amongst residents of urban areas and peripheries, a National Policy on the Urban Environment. This policy should deal with conservation and sustainable use of natural and human-influenced ecosystems and species in and adjacent to urban areas, focusing on minimising the impact of urbanisation on non-urban areas, the sustenance of a healthy ecological status for urban citizens, the protection of wildlife pockets and corridors within/around urban areas, and the security of urban livelihoods dependent on biological resources. This policy should lend weight to existing urban legislation relating to the environment, such as Trees Acts and Heritage Acts or rules.

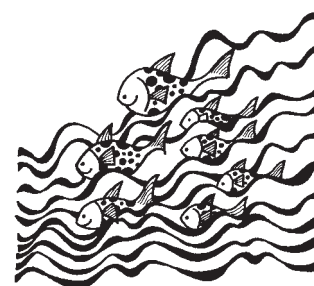
Justification: The urban natural environment is highly neglected in India, with resulting impacts on biodiversity, human health, the sustainability of urban systems, and destructive impacts on linked rural areas. There is no clear policy pronouncement on this, hence initiatives at conservation and sustainable use are ad hoc and unsystematic.

Suggested Responsibility: Ministry of Urban Affairs, MoEF, and other relevant ministries, with the central involvement of relevant institutions like National Institute of Urban Affairs, NGOs working on urban issues, urban labour unions and consumer associations.

Time Frame: 3 years

Steps:

As in *Actions 1* and *2* above, with modifications to suit urban conditions.



7.1.8.3 Strategy: Integrate Biodiversity into Existing Statutes and Associated Rules, Regulations and Notifications

Overall Justification: Changes in policies would need to directly feed into changes and modifications in the statutes, so as to create a conducive and comprehensive legal structure, which can then be implemented.

Actions

1. Integrate Biodiversity into the Constitution of India

Introduce the terms 'environment', 'biological diversity', 'biodiversity', and 'biodiversity-related knowledge' into the Constitution of India, in the following ways:

1. As part of the Directive Principles of State Policy (to add to the State's duty to protect the environment, Art. 48A);
2. As part of the Fundamental Rights of citizens (Part III);
3. As part of the Fundamental Duties of citizens (to add to the duties regarding protection of the environment, Article 51A);
4. As part of the 7th Schedule (Article 246) – the Concurrent List (which currently contains forests and other subjects);
5. As part of the powers and responsibilities of *panchayats* (Article 243G) and municipalities (Article 243W).

The actions above, may be done through amendments to the Constitution, or, where possible, through interpretations and provisions in appropriate existing laws (e.g. the word 'environment' could be interpreted to include biological diversity in all its forms, and related knowledge).

In addition, initiate a discussion on the need for a constitutional authority charged with the responsibility for safeguarding the environment, including biodiversity, with a position similar to that of the Central Election Commission and the Comptroller and Auditor General.

Justification: While the Constitution does provide for the protection of the environment in general, and of forests, wildlife, and other specific aspects of the environment, major gaps are left in the absence of the term 'biodiversity'. In particular, domesticated biodiversity and micro-organisms do not clearly figure in this, and there is no explicit provision for protecting biodiversity-related knowledge (especially traditional knowledge). Constitutional provisions of this nature will also provide backing to the Biological Diversity Act, 2002, as well as to this action plan and to any other such future legislation, policies, and programmes on biodiversity.

Suggested Responsibility: National Commission to Review the Working of the Constitution, if its term is continuing; else a special committee set up by the Government of India for the purpose; in association with members of this Commission, the Law Commission, MoEF, key national law schools, and groups like the Foundation for Ecological Security, Legal Action for Wildlife and Environment, and others that have been active on environmental law issues.

Time Frame: 3 years

Steps:

- i. National Commission or proposed committee to initiate national dialogue on the subject, including through regional and local consultations being carried out by groups/networks/agencies that are authorised for the process;
- ii. The resulting recommendations to be fed through the appropriate procedure to Parliament, or to the necessary authorities for follow-up.

2. Review, Amend, and Strengthen National Laws to Integrate Biodiversity

Review, from the point of view of biodiversity and related livelihoods, key national laws (and related notifications, guidelines and orders) that have a bearing on biodiversity, and move towards making the necessary amendments. For this, build on the preliminary assessment carried out by the Indian Institute of Public Administration (see



Section 6.1.8.3). In the case of certain laws already analysed as part of the NBSAP process, urgently initiate the move towards amendments suggested in the boxes and table in this section, and consider those amendments recommended in the *Laws, Policies, Institutions, and Planning Thematic BSAP*. The review and modifications should in particular, ensure the plugging of loopholes that allow destructive 'development' projects and processes to be cleared, and should provide maximum possible coverage to biologically diverse and unique regions, threatened and endemic taxa, and biodiversity-based livelihoods and rights. They should also ensure that the commercial and industrial uses of biological resources such as medicinal plants are demonstrably sustainable.



Justification: As analysed in *Chapters 5 and 6*, many of the laws, notifications, rules and guidelines relevant to biodiversity have inadequacies. It is crucial that existing statutes are made fully sensitive to biodiversity, if conservation efforts are to succeed and destructive forces to be countered.

Suggested Responsibility: MoEF and all development-related ministries including Commerce, Mines and Minerals, Industries, Rural Development, etc., Ministry of Law and Justice, and Ministry of Defence, along with legal and biodiversity experts from independent institutions, NGOs and community federations or associations.

Time Frame: Amended texts within 3 years; enactment of amendments thereafter

Steps:

- i. Review, with a view to strengthen or integrate biodiversity conservation and related livelihood concerns, the following laws: Indian Forest Act, 1927 (IFA), Forest (Conservation) Act, 1980 (FCA), Wild Life (Protection) Act, 1972 (WLPA), Environment (Protection) Act, 1986 (EPA); Patents (Amendment) Act; Mines and Minerals (Development and Regulation) Act, 1957; Land Acquisition Act, 1894; laws relating to marine areas (see Box 7.1.8.6) and other relevant legislation. For a preliminary review and suggestions for amendments relating to some of these laws, see *Laws, Policies, Institutions, and Planning Thematic BSAP; Box 7.1.8.5, and Table 7.2*; note also the law-related recommendations in earlier sections, such as *Section 7.1.2*.
- ii. Revise the laws as necessary and appropriate, based on the above review, and in consultation with the Department of Legal Affairs;
- iii. In particular, review forest legislation as part of comprehensive forest sector reforms (see Box 7.1.8.2);
- iv. Consider ways to integrate the principle of inter-generational equity into relevant laws (see Box 7.1.8.7);
- v. Ensure that the penal provisions of the laws take into account the ecological gravity of the violation, and that gradations in the extent of the punishment are in relation to the extent of actual or potential damage to ecosystems/species;
- vi. Lobby and raise awareness amongst law makers for bringing about the said amendments;
- vii. Introduce the amendments in Parliament;
- viii. Once amended, establish the necessary mechanisms for implementation.

Box 7.1.8.5 Wild Life Act's Provisions on Threatened Species

The Wild Life (Protection) Act, 1972, as amended in 2002, attempts to protect threatened species by prohibiting hunting (including capture), and giving coverage to their habitats by creating protected areas (PAs). However, given that considerable populations of such species exist outside PAs, this still leaves out a number of other threats that they face: habitat degradation and fragmentation outside protected areas, pollution, epidemics, etc. Thus, even if the current legislation is fully implemented, species like Dugong (marine habitat), Malabar civet (private lands), Great Indian bustard (community lands), etc. could become extinct.

The full conservation requirements of each threatened species need to be assessed, and appropriate measures legally mandated. This can be based on the Species Conservation Management Plans suggested in *Strategy 7.1.2.4*.

Rules or guidelines need to be formulated under the WLPA, or amendments made if existing provisions are not adequate, to take care of the above.

In addition, the WLPA needs to include all species listed under CITES that India has an obligation to protect against international trade; alternatively, a separate law to enforce India's obligations under CITES needs to be enacted.

Sources: *Wild Animal Diversity Thematic BSAP; Ajith Kumar, personal communication 2002; Ritwick Dutta, personal communication 2002*

Box 7.1.8.6 Marine Biodiversity Conservation and Livelihood Security in Relevant Laws and the Constitution

Shift marine fisheries from the State and Union lists to the Concurrent list in the Constitution, to facilitate coordinated measures for conservation and sustainable management of marine areas and resources.

Review and amend the following laws, to integrate as central thrusts the conservation of marine biodiversity, and secure livelihoods of traditional, small-scale fisherfolk:

1. Territorial Waters, Continental Shelf, Exclusive Economic Zone and other Maritime Zones Act, 1976;
2. Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act 1981 (and rules therein, 1982);
3. Marine Products Export Development Authority Act 1972;
4. Marine Fishing Regulation Acts of maritime States.

Eventually, enact a Marine Areas (Conservation, and Sustainable and Equitable Use) Act, to complement the above (see *Section 7.1.8.4, Action 2*).

Review and revise the Guidelines for Fishing Operations in the Indian EEZ, November 2002, issued by the Ministry of Agriculture, ensuring that they conform to the recommendation of the Murari Committee to encourage vessels below 20 m. length to operate in the EEZ.

Justification: Given the nature of marine resources, it is difficult to manage them through separate state legislations and programmes, and there are frequent problems of inter-state conflicts or lack of coordination about seasonal bans and restrictions. This, therefore requires a more coordinated approach through joint centre-state management, which could be done through marine fisheries being shifted to the Concurrent List. Also, the focus of marine legislation in India has largely been on fishing vessels and on law and order issues, rather than on the fishery resources and related aspects like ecosystem conservation and sustainability. Even the provisions for 'conservation and management' that some of the above laws contain have almost never been used, and there are hardly any specific rules under them that could lead to conserving, maintaining, and restoring the marine environment. Finally, the latest (November 2002) guidelines on the subject from the MoA encourage foreign vessels and citizens to carry out fishing rather than encouraging India's own traditional fisherfolk.

Suggested Responsibility: Ministry of Agriculture, MoEF, with the central involvement of fisherfolk associations like the National Fishworkers' Forum, national fishery research/survey institutions, and NGOs/institutions like the International Collective in Support of Fishworkers, and Centre for Development Studies.

Source: *Adapted from Mathew 2000; Mathew 2003.*

3. Strengthen the Environment Impact Assessment Procedure

Overall Justification: The EIA and environmental clearance procedures, as prescribed under the EIA Notification (see *Section 6.1.1.2*) are important tools to understand the possible impacts of a developmental or industrial project, and to take the appropriate decision on this project. However, there remain a number of inadequacies in the notification, and in its implementation. These include:

- i. Absence of several kinds and sizes of development/industrial projects and activities from the list of projects requiring EIAs;
- ii. Lack of impact assessment of the combined or cumulative effects of projects, as every project is assessed independently;
- iii. Lack of impact assessment of policies and sector-wise programmes (as distinct from EIAs of individual projects);

- iv. Weak integration of biodiversity (especially 'lesser' species and agro-biodiversity) and of long-term and indirect impacts into the guidelines and EIA reports;
- v. Inadequate or no exploration of alternatives to the proposed project;
- vi. Absence of participation of affected people in the EIA process;
- vii. Inadequacies in the public hearing process including the lack of any guarantee that affected people will have a say in them and that the results of the hearing will influence the decision on the project;
- viii. Lack of expertise and humanpower amongst concerned authorities;
- ix. Frequently biased, incomplete or unsubstantiated EIA reports;
- x. Lack of integration of decentralised decision-making and local self-governance principles into the process.

These weaknesses need to be plugged, for the environmental impact procedures to achieve their main objective of safeguarding the environment against irreversible destruction.

Suggested Overall Responsibility (for all the steps below, in addition to others specified): Impact Assessment Division, MoEF.

(Note: The steps recommended below are taken or adapted from a number of sources, including: *Mining and Biodiversity Sub-thematic Review*; *Environmental Impact Assessment and Biodiversity Sub-thematic Review*; Kothari 1998)

Steps:

- i. Bring in specific amendments to the EIA notification in order to strengthen it.
(The *National Conservation Strategy* recommends, 'Carry out environmental impact assessment of all development projects right from the planning stage and integrate it with their cost-benefit considerations.')
- This would include the following measures:
- a. Make EIA and Environmental Public Hearing mandatory for all developmental/ industrial projects;
 - b. Make clear that the provision for 'site clearance' does not imply any commitment on the part of the Impact Assessment Agency to grant environmental clearance;
 - c. Ensure that the views expressed in public hearings, especially from affected populations, are given a more central place in decision-making;
 - d. Incorporate, into the 'Checklist for Ecological Impact Assessment', of the MoEF EIA Manual, aspects such as impacts on agricultural biodiversity, impacts on biodiversity-related traditional knowledge, impacts caused by livelihood changes brought about by the project, cumulative impacts of projects that are technically linked or are in the same ecological region, and impacts of the eventual closure of the project or components of the project; also include a full exploration of alternatives, especially decentralised alternatives to mega-projects.
 - e. Make Annexure VII of the EIA Manual 'Guidance for Relevant Issues for Different Project Types' more comprehensive with respect to each project.
 - f. Link the EIAs to the project cost-benefit analysis, with full costing of the ecological losses and benefits (see also *Strategy 7.1.9.3*), including quantitative and qualitative estimates. Make appropriate changes in cost-benefit guidelines of the Planning Commission and other bodies.
 - g. Explore new approaches such as Environmental Risk Assessment, which enable more flexible and dynamic assessments of direct and indirect ecological impacts.

Time Frame: 2 years

- ii. Make the MoEF Regional Offices responsible for environmental clearance of activities with investment up to Rs 1 crore, and add to their capacity to handle this with full public participation and transparency

Suggested Additional Responsibility: Regional offices of MoEF

Time frame: 2 years



- iii. Introduce penal measures for fraudulent EIA reports.

Suggested Additional Responsibility: Regional Offices of MoEF.

Time Frame: 1 year.

- iv. Strengthen biodiversity integration into the EIA guidelines; in particular, build in agricultural biodiversity, aquatic biodiversity other than commercial fish, 'lesser' plants and animals, ecosystem benefits and services, and flora-fauna inter-relationships; include also detailed steps for ecological restoration (including of threatened and endemic species) (*see also Strategy 7.2.8.3, Action 2*).

Suggested Additional Responsibility: Respective environmental appraisal committees of MoEF, in consultation with NGOs and experts who have worked on EIA aspects.

Time Frame: 1 year

- v. Ensure autonomy in the preparation of EIA reports.

The EIA should be completely independent of the project proponent, and should be carried out by accredited and reputed agencies. For this, a Central EIA Fund should be created, comprised of money deposited into it by project proponents (delinked from the EIA related to this project) and from other sources; a roster of accredited EIA experts should be prepared for commissioning the EIAs.

The Central EIA Fund can also support the cost of organizing public hearings. This is important because one of the reasons behind the provision for public hearings being removed for certain categories of projects was the financial load on small investors.

Time Frame: 1 year

- vi. Ensure public participation in the preparation of EIA reports.

Suggested Additional Responsibility: The agency conducting the EIA, with respective *panchayat*/municipal and district authorities and local NGOs; monitoring by MoEF regional offices mentioned in Action 2 above.

Time Frame: 6 months for guidelines to be issued; implementation ongoing thereafter.

- vii. Ensure wide distribution of the EIA report (including in local languages) on relevant websites (including those of MoEF, relevant state departments, and the project authorities), and at public offices.

Suggested Additional Responsibility: EIA agencies and local authorities.

Time Frame: Ongoing

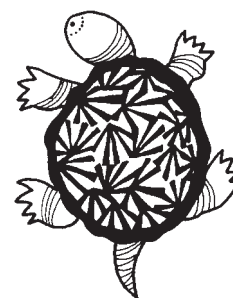
- viii. Ensure that public hearings are truly democratic and open, ensuring full prior provision of information, use of local languages, and pro-activeness in making them accessible to the most vulnerable sections of the affected populations.

Suggested Additional Responsibility: Civil authorities along with the respective EIA agency and local NGOs, with involvement of *panchayat* or municipal bodies of the affected population.

Time Frame: Ongoing



- ix. Make the consent of local communities and urban wards or residents' associations mandatory before environmental and forest clearance can be granted; use for this the mandate provided by the *panchayat*- and municipality-related constitutional amendments and laws, and the MoEF Letter No. 11-30/96-FC(pt.), dated 26.2.1999, which specifies that 'it has been decided that whenever any proposal for diversion of forest land is submitted, it should be accompanied by a resolution of the '*aam sabha*' of the *gram panchayat*/Local Body of the area endorsing the proposal that the project is in the interest of people living in and around the proposed forest land.' Circulate this letter to all *gram sabhas*, urban wards, and other relevant local bodies.



Use also the CBD's draft guidelines or recommendations for the conduct of Cultural, Environmental, and Social Impact Assessments regarding developments proposed to take place on sacred sites and on lands and waters occupied or used by indigenous and local communities.

Suggested Additional Responsibility: Impact Assessments Division of MoEF to issue guidelines linked to the above-mentioned circular; implementation by panchayat and municipal bodies with facilitation and monitoring by NGOs and relevant official agencies, including ZSI and BSI.

Time Frame: Guidelines within 6 months, implementation ongoing thereafter.

- x. Build in automatic withdrawal of clearance if the conditions of clearance are being violated, and introduce more stringent punishment for non-compliance.

Suggested Responsibility: MoEF

Time Frame: 1 year

- xi. Conduct policy-level and sector-wide EIAs, or Strategic Environmental Assessments, to judge the impacts of macro-economic, developmental, and other policies, schemes, and programmes.

Suggested Responsibility: Multi-disciplinary team to be set up by MoEF.

Time Frame: 3 years for existing sectoral policies/schemes/programmes, and ongoing thereafter for any new ones, *before* they are introduced or operationalised.

Box 7.1.8.7 Integrating Inter-generational Equity into Law

There is an urgent need to consider the integration of inter-generational equity considerations into relevant laws and policies (*Laws, Policies, Institutions, and Planning BSAP*).

Justification: One of the critical challenges facing the development of laws for biodiversity conservation is how to ensure the rights and interests of as yet unborn generations. Do they have legal rights, which would ensure a level of natural and cultural diversity that current generations enjoy?

An interesting precedent on this has been set by a 1993 judgement of the Philippine Supreme Court, in the case *Minors Oposa v. Secretary of the Dept. of Environment and Natural Resources*. The Court allowed a class action by Filipino children, acting as representatives for themselves and for future generations, arguing for a halt in timber cutting in national forests. The Court held that the petitioners were qualified to sue on behalf of current and future generations, and accepted their statistical evidence about how much forest cover is required to maintain a healthy environment for all generations.

Suggested responsibility: A group of legal experts, biodiversity specialists, economists and social activists, to be set up by the Law Commission.

Time frame: 3 years

4. Frame Rules to Strengthen Conservation, Sustainable Use and Equity Under the Biological Diversity Act 2002

Frame a set of rules to enable the provisions of the Biological Diversity Act, 2002, to be implemented, while helping to interpret and strengthen its framework provisions in a way that achieves conservation, sustainable use and equity in relation to biodiversity.

In particular, frame rules and interpretational text for the following:

1. Clear contractual agreements for the transfer of genetic resources and related knowledge, and for the sharing of benefits;
2. Guidelines on research agreements, which, being exempt from some of the provisions of the Act, will have to be strictly regulated;
3. Clear-cut procedures for Indian entities to intimate SBBs on proposed use of bioresources, for states to be able to control over-exploitation, especially by industrial houses (this needs to be backed up by clear guidelines on methods for assessing 'sustainable use'; see Section 7.1.1.1, Action 6, and Sections 7.1.4 and 7.2.4), and for states to enforce benefit-sharing with local communities;
4. Guidelines for distributing the benefits within and between communities, taking into account problems of political, economic and gender inequities;
5. Guidelines for the networking necessary to ensure that the use of Indian resources and knowledge by foreigners, is tracked, and that misuse is quickly detected and tackled;
6. Modifications in existing EIA procedures, to integrate all biodiversity aspects (see Action 3 above);
7. Guidelines for periodic assessment of national programmes and policies (e.g. on agriculture and industry) from the biodiversity point of view;
8. Measures for legal protection of local community knowledge, including effective community rights regimes, free prior informed consent (see Box 7.1.5.1), and the protection of documents and registers recording such knowledge (see also Strategy 7.1.5.4, Action 5);
9. Procedures to ensure transparency and public accountability in the functioning of the NBA, SBBs, and BMCs;
10. Further powers to local bodies to manage their biological resources and protect community or individual knowledge, in conjunction with *panchayat* laws; and the clarification that BMCs should be constituted by *gram sabhas* or equivalent tribal assemblies alone (see Section 7.3.3);
11. Clarification that in the case of contradictions between this Act and others relating to traditional knowledge, this Act will prevail, including in matters relating to prior informed consent of the knowledge-holder, intellectual property rights, and benefit-sharing.

Justification: The Biological Diversity Act has several framework provisions, which cannot be implemented by themselves. Hence there is a need for rules, with interpretations and guidelines, to enable effective implementation.

Suggested Responsibility: MoEF and other relevant ministries, with relevant research, action and advocacy groups working on biodiversity.

Steps:

- i. MoEF to set up a working group to draft the rules; this group to comprise a mix of sectors, including well-known community experts, NGOs, scientists and relevant government agencies;
- ii. The working group to hold consultations with various sectors before and after drafting a set of rules;
- iii. The group to finalise the rules for MoEF to consider and take forward.

7.1.8.4 Strategy: Formulate New Acts for Missing Elements

Overall Justification: As in the case of policy amendments, changes in the existing legal provisions may not be enough to build a comprehensive legal milieu which is sensitive to biodiversity and livelihood security. Therefore, some new legal spaces need to be created.

Actions

1. Enact a Wetlands (Conservation, and Sustainable and Equitable Use) Act

(See also proposed Wetlands Policy, Strategy 7.1.8.2, Action 1).



Formulate, through a widespread participatory process, a Wetlands (Conservation, and Sustainable and Equitable Use) Act, enact it, and set up mechanisms for implementing it. This Act should deal with the management and use of the wetland bodies themselves, as also land-uses in the critical surrounding and catchment areas (The National Conservation Strategy recommends 'Protection of land near water bodies and prevention of construction thereupon!') Ensure that it is compatible with, and links actively to, existing related laws such as Wild Life (Protection) Act and Biological Diversity Act.

Justification: *Section 7.1.8.2* highlights the need for developing a policy for wetlands, which have so far been neglected in the present legal system. Implementable yet stringent legal regulations are necessary to give teeth to such a policy, if these critical habitats are to be conserved.

Suggested Responsibility: As in *Strategy 7.1.8.2, Action 1*.

Time Frame: 2 years to formulate, enactment thereafter.

Steps:

As in *Strategy 7.1.8.2, Action 1*.

2. Enact a Marine Areas (Conservation, and Sustainable and Equitable Use) Act

(see also proposed Marine Policy, *Strategy 7.1.8.2, Action 2*)

(modify from *Action 1* above; steps as in *Strategy 7.1.8.2, Action 2*; add a provision for declaration of protected areas beyond 12 nautical miles, in the continental shelf; include, in the drafting process, the federations and institutions mentioned in *Action 2 of Strategy 7.1.8.2*).

3. Enact an Urban Natural Heritage Act

(see also proposed Urban Environment Policy, *Strategy 7.1.8.2, Action 3*)

Formulate, through a widespread consultative process in urban areas, an Urban Natural Heritage Act, enact it, and set up implementation mechanisms. This should have provisions to conserve and sustainably use the natural and human-influenced ecosystems and species in urban areas, and safeguard the livelihoods of those dependent on urban natural resources. Particular focus should be on urban forests and green belts, wetlands, coastal stretches, corridors with the larger landscape and seascape, and agro-biodiversity-rich areas. Provide this law legitimacy under the 74th Constitutional Amendment.

Justification: Though there are a number of city-specific laws which aim to protect particular urban natural sites (e.g. Tree Protection laws, or Urban Heritage laws, which, in cases like Nagpur, have been extended to include natural areas), there is no comprehensive national legislation on this. This leaves major gaps in coverage in a majority of urban areas. Urban wetlands in particular are badly protected, and there is no protection whatsoever for agro-biodiversity-rich sites that are surrounded by or adjacent to urbanised areas. Hence there is a need for a comprehensive national legislation.

Suggested Responsibility: Ministry of Urban Affairs, MoEF, and other relevant ministries, with the central involvement of relevant institutions like National Institute of Urban Affairs, NGOs working on urban issues, urban labour unions and consumer associations.

Steps:

As in *Strategy 7.1.8.2, Action 3*.

4. Enact a Traditional Knowledge Protection Act, or Traditional Knowledge Protection Rules Under the Biological Diversity Act

Formulate, through widespread consultation with local fisherfolk, adivasi, peasant, pastoral, and artisanal com-



munities, a Traditional Knowledge Protection Act, or Traditional Knowledge Protection Rules under the Biological Diversity Act.

(for details, see *Strategy 7.1.5.4, Action 5*).

7.1.8.5 Strategy: Integrate Biodiversity and Equity into Panchayat Legislation, and Make it Effective and Accountable

Overall Justification: In the present governance structure, the Panchayati Raj Institutions (PRI) are forums for decentralised decision-making. However, the potential of the *panchayat*-related laws, as well as the capacity of the PRIs, have not been adequately utilised. There is a need to strengthen this system and use it as a mechanism for the formal involvement of local communities in planning and implementation of policies, laws and programmes, both existing and proposed. However, the gaps in the existing *panchayat* Acts, including those related to biodiversity, need to be understood and plugged for this mechanism to be successful.

Actions

1. Integrate biodiversity and equity responsibilities into the central and state *panchayat* laws, and the Representation of the People Act

Integrate into the mandate of Panchayati Raj institutions, duties and responsibilities for the conservation of biodiversity, sustainable use of resources, and achievement of equity in relation to biodiversity (*see also Box 7.1.8.8*). This should be done in the case of both central and state laws relevant to *panchayats*. Amongst the provisions to be introduced could be the responsibility to maintain a fourth to a third of the territory of the *panchayat/gram sabha* under natural or semi-natural conditions (including forests, grasslands, wetlands, coasts, marine areas).

Justification: Experience has shown that the existing PRIs in the country are often not fully responsible towards natural resources or biodiversity. Often they are also not truly representative of local needs, and do not adequately represent the interests of women and other underprivileged sections. Political motivations and personal interests tend to creep in, defying the purpose of decentralisation, and leading to ecologically damaging or inequitable decisions. The existing regulations pertaining to PRIs need to be understood and reviewed to address the above issues. Amendments to law would not be enough by themselves, but, when coupled with other empowerment measures, they could provide a strong basis for greater sustainability and equity amongst local communities.

Suggested Responsibility: MoRD, MoTA, MoEF and other central ministries, along with *panchayat* departments and other relevant State Government agencies, with central involvement of *zilla panchayat* heads, leaders from community networks and movements like *Hamare Gaon Mein Hamara Raj*, expert institutions working on decentralisation, and relevant NGOs.

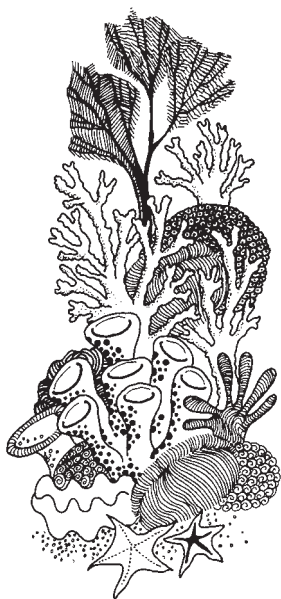
Time Frame: 3 years for the review, enactment thereafter.

Steps:

- i. Carry out an analysis and review of all existing State Panchayat Raj Acts, from the point of view of ensuring that PRIs carry out their natural resource-related functions in a manner that is equitable and ecologically sustainable;
- ii. Review the Representation of the People Act, from the point of view of ensuring free and fair elections to *panchayat* bodies, and to make *panchayat* representatives more accountable/answerable to individuals and the local community;
- iii. Conduct widespread consultations on the above analyses, and, based on the results, carry out amendments of, and/or drafting of rules under, the *panchayat* laws.

2. Empower Gram Sabhas or Appropriate Village-Level Institutions to Implement Laws

Provide *gram sabhas*, or committees set up by *gram sabhas*, with the powers to implement biodiversity-related laws and policies within their jurisdiction.



Justification: There is currently complete dependence of people on government bodies for development and welfare inputs, law and order maintenance, etc. However, where communities have organised themselves, they have shown that they can take most such matters into their own hands, and manage human and natural resources quite well. Devolution of implementation authority to communities, within certain limits and with built-in safeguards, should therefore be attempted.

Suggested Responsibility: Department of Panchayats (or equivalent) at state level, along with relevant state departments; Ministry of Rural Development

Steps:

- i. Set up a committee, with appropriate representation, including from women and men of local communities, to work out detailed guidelines for the gender-sensitive implementation of panchayat-related laws, and biodiversity laws related to panchayats;
- ii. Take urgent steps to implement the provision relating to ownership of non-timber forest produce, management of minor water bodies, carrying out social forestry, consultation of *gram sabhas* for development projects and land acquisition (vide the EPA-related circular to all state governments to obtain no-objection certificates from villages that could be affected by such projects), and other biodiversity-relevant provisions (see Box No. 7.1.8.8);
- iii. Implement the provisions in the Biological Diversity Act 2002, relating to protection of traditional knowledge, the involvement of communities in determining access to their bio-resources and knowledge, equitable benefit-sharing, etc., as elaborated in the proposed rules and guidelines.

Box 7.1.8.8 Using PESA, 1996, for Biodiversity and Livelihoods

The Panchayat (Extension to Scheduled areas) Act (PESA), 1996, applicable to Schedule V areas (areas in India other than the north-east, where there is a predominance of adivasi population, and which are listed for specific consideration under Schedule V of the Constitution of India) in 7 states, devolves some level of authority over natural resources to the residents. However, this Act has hardly been implemented as yet, and there are many dilutions that have taken place in the related state-level legislation.

This situation can be changed to one where the *gram sabha* or equivalent body consisting of all women and men of the settlement is indeed the fundamental unit of governance and is authorised to sustainably and equitably manage the resources within its jurisdiction. The following actions would be necessary for this:

1. Build capacity of communities and line departments in Schedule V areas

Justification: Communities, and in many cases officials of line departments, are still by and large not aware of the rights and responsibilities assigned to them under PESA. In the last fifty years, there has been erosion in traditional institutions of management and considerable alienation of traditional communities. Hence there is an urgent need to rebuild capacity of communities in matters regarding governance, and sensitisation of line department officials and staff towards decentralised decision-making processes.

Suggested responsibility: Ministries of Human Resource Development, Tribal Affairs, Social Justice and Empowerment, and Environment and Forest; with relevant State Departments and through training institutions, community institutions and NGOs.

Time frame: Ongoing

Steps:

- i. Widespread dissemination of the PESA to Central and State Government departments, including Mining, Revenue, Forest, Tribal Welfare, Women and Children Welfare, Agriculture, Power, Irrigation, and other relevant departments; and to

social workers and activists, and any other agency dealing with people and issues relating to Schedule V areas. Where necessary, this should be in local languages. The basic Act should be accompanied by a table explaining which provisions are applicable to which department and scheme/programme, so that each department is clear on its role under PESA. For example, land acquisition cannot be done without consulting the relevant *Gram Sabha*, which is information that should be available with the Collector's office in each district in Schedule V areas.

- ii. Widespread dissemination of the rights and responsibilities assigned to local communities, in local languages, to enable the *gram sabha* to discharge its role as the fundamental unit of governance. Meetings and workshops should be organized in each village where government officials/social workers should enable people to understand the provisions of PESA.
- iii. Organising regular programmes in each village/settlement, to build capacity for equitable decision-making, financial management, ecological monitoring and research, and other such skills that would be necessary to ensure that local communities are enabled to conserve biodiversity, use natural resources sustainably, and work towards gender justice and other forms of equity.
- iv. These actions can be built up on, and lessons learnt from, a number of such ongoing initiatives, including those of institutes like National Institute of Rural Development etc.), mass tribal organisations and movements for Tribal Self-Rule like *Hamare Gaon Mein Hamara Raj* (Maharashtra/ Madhya Pradesh/ Chhattisgarh), and NGOs working amidst *adivasis* in Schedule V areas.

2. Clearly demarcate village boundaries and village commons, with mapping and computerisation of land/resource records

Justification: There is considerable ambiguity in the definition of village boundaries and the areas where minor forest produce or other resources can be harvested. PESA gives scope to determine the fundamental unit of governance. This is because the Schedule V areas are not homogenous in terms of communities and resources used, and a blanket definition therefore has been avoided. This is clearly a difficult administrative task, as there are very inadequate land records of tribal and other communities, and in many places forests that people traditionally depended upon for non-timber forest produce have later been declared Reserve Forests. Unless the local community clearly understands the boundaries of the village and commons, the implementation of PESA would be chaotic.

This demarcation should also be seen as a tool to stop the influx of people from areas outside Schedule V area, who might not have the same traditional relationship with the forests. Clear mapping of the traditionally used waters of coastal communities is also needed.

Steps:

- i. A time-bound and detailed exercise needs to be carried out in each district to determine the basic units of governance. For example, a hamlet that has functioned independently should be called a 'village' for the purpose of implementation of PESA, though the land records declare it as part of a bigger village. There will be considerable confusion between records of villages in the Revenue department and this confusion must be sorted out, after which the records should be mapped and computerized.
- ii. A thorough participatory mapping of commons should be done. Conflicts between Community, Forest Department, Revenue Department, Fisheries Department, other communities etc., regarding the ownership of these lands need to be settled through transparent public hearings in a time-bound manner, by a court set up explicitly for this purpose.
- iii. A complete documentation of traditional patterns of resource use, methods of ensuring sustainable levels of produce, and traditional methods of dispute resolution needs to be done with the participation of community members, by, forest officials, other Government officials, anthropologists and environmentalists (This could be linked to the action on documentation of traditional knowledge, and Community/People's Biodiversity Registers, in *Section 7.1.1.2, Action 1 and Section 7.2.6.2, Action 4*).

3. Transfer ownership and conservation responsibility over non-timber forest produce, village wetlands and other resources to the gram sabha

(see *Section 7.1.5.1*)

4. Ensure that land acquisition in Schedule V areas strictly follows the GOI order regarding land acquisition in Schedule V areas.

Ensure that land acquisition for developmental or other purposes in Schedule V areas follows the interpretation and guidelines issued by GOI regarding the following PESA provision: 'The *gram sabha* or the *panchayats* at the appropriate level shall be consulted before making the acquisition of land in the Scheduled Areas for development projects and before re-settling or rehabilitating persons affected by such projects in the Scheduled Areas; the actual planning and implementation of the projects in the Scheduled Areas shall be coordinated at the State level. These guidelines stress the need for a written resolution from the relevant *gram sabha*, and a written consent from the relevant *gram panchayat* (Letter dated 11th November, 1998 from Secretary, Rural Development, GOI to all Chief Secretaries).

5. Ensure fully attended public hearings for development projects/processes in Schedule 5 areas

Ensure that, as part of the public hearing process for development projects under the EPA notification on EIAs, public consultation with the *gram sabha* of the villages to be affected is mandatory. Such consultation should be with the full village or unit of governance, should be preceded by adequate and local language dissemination of information relevant to the proposed project/process (including through oral means), and should make special provisions for underprivileged sections including women to make their presentations.

3. Build in Customary Governance Structures into Acts in Schedule VI Areas

Ensure that the *panchayat* and other laws in Schedule VI areas in north-eastern India build on the already existing traditional and customary structures of governance rather than replacing them; where necessary, changes could be introduced to make these structures more equitable and biodiversity-sensitive.

Justification: In the Sixth schedule states there is a good network of traditional village- and district-level councils the authority of which is recognised. Proper delegation of authority and clear distinction over subject matter between the State Government and the district autonomous councils is required. Moreover, these bodies at the lower level will be more efficient if they remain apolitical and have no political affiliations (Pant 2002).

Suggested Responsibility: Relevant north-east Indian state governments, in consultation with the Ministry of Tribal Affairs, Ministry/Department of North-East Affairs, the North-East Council, tribal peoples' forums and federations, relevant experts from the North-East Hill University, and relevant NGOs.

Time Frame: 2 years

Box 7.1.8.9 Rights of the Adivasi/Indigenous Tribal Peoples

1. The following rights should be established, or where already existing, strengthened, for *adivasi* and indigenous tribal peoples of India (adapted from the UN Draft Declaration on the Rights of Indigenous Peoples relating to Indigenous Knowledge and Cultural Heritage):

- Art. 3: The right of self-determination. By virtue of this right they should be able to freely determine their political status within the broad framework of the Indian constitution, and to freely pursue their economic, social and cultural development.
- Art. 12: The right to practice and revitalise their cultural traditions and customs. This includes the right to maintain, protect and develop the past, present and future manifestations of their cultures, such as archeological and historical sites, artifacts, designs, ceremonies, technologies, and visual and performing arts and literature, as well as the right to the restitution of cultural, intellectual, religious and spiritual property taken without their free and informed consent or in violation of their laws, traditions and customs.
- Art. 24: The right to their traditional medicines and health practices, including the protection of vital medicinal plants, animals and minerals.

- Art. 26: The right to own, develop, control and use the lands and territories, including the total environment of the lands, air, waters, coasts and seas, flora and fauna, and other resources which they have traditionally owned or otherwise occupied or used, within the bounds of conservation, sustainable use, and equity. This includes the right to the full recognition of their laws, traditions and customs, land-tenure systems and institutions for the development and management of resources, and the right to effective measure by states to prevent any interference with, alienation of, or encroachment upon their rights.
 - Art. 29: Recognition of the full ownership, control and protection of their cultural and intellectual property. They have the right to special measures to control, develop and protect their sciences, technologies and cultural manifestations, including human and other genetic resources, seeds, medicines, knowledge of the properties of the fauna and flora, oral traditions, literatures, designs and visual and performing arts.
2. To meet the existing and emerging international standards, including the Convention on Biological Diversity (CBD), Agenda 21, etc., the principle of participatory self-governance (as provided in Article 244 of the Panchayat (Extension to Schedule Areas) Act, 1996; Article 371 (A) and 371 (G), Manipur (Hills Areas) District Act, 1971, and other legislation) should be further strengthened and vigorously pursued. This is where the supremacy of the *gram sabhas* and indigenous decision-making bodies is affirmed, within the bounds of ecological sustainability and social justice. As a first step, there should be notification of *adivasi* habitations that are **not yet** notified as scheduled (e.g. in Karnataka, Kerala, Tamil Nadu and West Bengal).
 3. GOI should sign and ratify the ILO Convention 169 on Indigenous and Tribal Peoples, as this provides a solid foundation for establishing equity and participatory decision-making.

7.1.8.6 Strategy: Strengthen Customary Law

Actions

1. Document, Encourage, Review, and Build Upon Customary Law, and Provide it Space Within Statutory Law (See also *Customary Laws and Biodiversity in North-east India Sub-thematic Review*).

Justification: There is a plurality of legal systems being followed in some parts of India. On the one hand there are the formal or modern central laws that are extended to these states, and on the other, are the traditional customary laws emanating from within the community, which in some instances are being recognised by the modern institutions as well. In addition, in some parts of north-eastern India, with the Sixth Schedule states creating the Autonomous District Councils, which have been empowered³ to enact laws for the region within their jurisdiction, there is a third set of laws enforced within the same region. The laws made by the Autonomous councils are closer to customary laws and social practices of local communities and are applicable in cases where both the parties in a dispute are tribal.

This also leads to the existence of multiple institutions administering justice in the given region: traditional institutions dealing with customary and folk laws, formal administrative bodies like the Deputy Commissioner in some of the North-Eastern states where the Executive and Judiciary are still not separate, a formal judiciary with the High Court bench as the apex body for other states, and a third body at the intermediate level in the sixth schedule states – the Autonomous District Councils, also vested with judicial powers.

To ensure that biodiversity issues are satisfactorily dealt with in areas where customary law prevails, or where they are sought to be revived as in Schedule V areas (predominantly tribal areas in some states), a mechanism should be developed to bridge the gap between the provisions of the statutory and customary laws relevant to each region. This can be done by making a concerted effort to take the statutory law to the people, and conversely by making government departments aware of the customary legal regimes prevailing at the micro-level. This will hopefully lead to better conservation of natural resources, with both the parties having

greater regard for the laws made at different levels. Differences between the formal and folk law can also then be ironed out.

Suggested Responsibility: Ministry of Law and Justice, Ministry of Tribal Affairs, Ministry of Environment and Forests, regional bodies like the North-East Council, mass tribal organisations, networks of nomadic and other communities, relevant state government departments, with help from customary law experts from relevant institutions and NGOs.

Time Frame: 2 years for documentation, 3 years for integration into legal and policy regimes.

Steps:

- i. Document customary law and social practices relating to natural resource management being practiced in different regions, and assess their relevance to conservation of biodiversity, sustainable use and equity.
- ii. Harmonise statutory and customary law through the following steps:
 - a. Any new law that is being legislated should be in harmony with local social practices and customs related to natural resource management, provided such customs are in tune with biodiversity and equity considerations.
 - b. Amendment of existing statutory laws, or relevant rules under these laws, to incorporate the unique position of customary laws, especially in north-eastern India and in other *adivasi* and coastal areas; these laws should also be in consonance with PESA.
 - c. Working out dispute resolution mechanisms for various conflicts, including inter-village or inter-community conflicts, building on traditional mechanisms where relevant;
 - d. Recognition of folk law by all, and especially by the highest judicial bodies.
- iii. Create an enabling legal framework: It is evident that customary law by definition implies decentralized and pluralistic governance mechanisms and processes and can serve sustainable and equitable management of resources, provided it is located within a larger enabling framework that upholds and imposes such norms. Such an enabling framework can be achieved by:
 - a. A thorough reform of the legislative powers of the Centre and States under the Indian Constitution as per Lists I, II, and III (Union, State and Concurrent Lists) and the creation of a Fourth List – a Local List – whereby subjects are reserved for local bodies at the district, sub-district and village levels, and Municipal Bodies for the framing of laws and their enforcement;
 - b. Enabling local governance bodies to evolve appropriate laws for development based on sustainable and equitable management of natural resources.
- iv. Promote legal literacy and public dialogue among citizens, right-holders and other stakeholders.
- v. Build the capacity for local self-governance with respect to law-making, enforcement and dispute resolution; in particular, build such capacity in relation to customary laws, in the Biodiversity Management Committees proposed under the Biological Diversity Act 2002.
- vi. Encourage inter-generational transfer of customary/folk law, and revive pride in the younger generation vis-à-vis customary/folk law through its integration into the education system and through social recognition, awards, and other means.
- vii. Attempt revival of customary law where it has eroded, if still relevant and useful in traditional or modified form; learn from the many community initiatives in this direction;
- viii. Enact separate biodiversity policies for north-eastern India (and for other tribal areas including Schedule V areas), which emphasise the role of customary law, traditional knowledge, cultural diversity, and self-governance structures.



7.1.8.7 Strategy: Strengthen/Create Mechanisms for Implementing Existing Legislation

Overall Justification: As highlighted in *Section 6.1.8*, there are several existing legal provisions in place, which aim towards natural resource conservation. Even while the gaps identified in these are plugged through the strategies and actions suggested above, there is a need to more effectively implement their existing provisions. There exist today several loopholes and discrepancies, including lack of capacity, inadequate political will, official aversion to citizens' involvement, and inadequate facilities with implementing agencies.

Actions

1. Set Up Participatory Monitoring Mechanisms at Centre and State Level

Set up, at the centre and in each state, appropriate mechanisms to monitor the implementation of biodiversity-related laws and policies.

Justification: There are no overarching, legally empowered institutions that can monitor the implementation of environment-related laws, and advise the central and state governments based on such overseeing and monitoring. Such mechanisms are urgently needed.

Suggested Responsibility: MoEF and State governments, through the proposed National Biodiversity Authority and State Biodiversity Boards.

Time Frame: 2 years.

Steps:

Appropriate legislation or government orders to be introduced for the setting up of such monitoring mechanisms, involving political leaders, relevant government officials, relevant experts, and representatives from *gram sabhas*, chosen by local communities. It would be necessary to develop indicators and measurable targets to follow the implementation status of each Act, with a system of regular monitoring and public reporting carried out by the relevant institutions.

2. Set up Environment Courts or Environment Benches in Existing Courts, and Strengthen Other Infrastructure for Legal Action

Set up special Environment Courts (or Environment Benches in existing courts at all levels) to deal with disputes and citizens' complaints relating to environmental laws, including those related to biodiversity. Learn from the experience of such courts already set up in Haryana and Uttar Pradesh.

Simultaneously, at the Central as well as State levels, infrastructure needs to be provided to question/challenge before appropriate bodies, including the courts, the non-implementation of environmental statutes. The facility to carry out this function could be provided to members of the legal community at the Supreme Court as well as the High Court and District Court levels. A nationwide network of lawyers would have to be created, and possibly be centrally coordinated. In addition to efforts to ensure the implementation of pro-conservation and pro-livelihood statutes, the facilities required for initiating litigation (as a last resort) in cases where legal intervention is required, should be made easily accessible to citizens through such a network of lawyers.

Justification: Existing courts at local, state, and national levels are already suffering from a heavy backlog, causing serious delays in dealing with environmental cases, which in any case tend to get a low priority. In addition, these courts often find themselves out of their depth in dealing with complex ecological and livelihood rights issues. Specialised courts would be able to resolve these problems.

Suggested Responsibility: MoEF and Ministry of Law and Justice, along with respective state governments, with guidance from the Law Commission, national law schools and colleges, and other relevant groups and NGOs working on environment law issues.

Time Frame: 3 years

Steps:

- i. MoEF and MoLJ to consult with justices of the High Courts and the Supreme Court, regarding the advisability and feasibility of setting up Environment Courts or Environment Benches;
- ii. MoLJ and relevant state departments to make available facilities for the creation of such courts/benches, and consult with relevant law colleges, NGOs and community-based organisations about preparing a roster of



resource people and experts who could assist the courts/benches as and when necessary.

(Link also to *Section 7.1.6.9* on building capacity of judiciary and legal functionaries.)

3. Review Citizens' Locus Standi Provisions, and Make Laws More Accessible to Local Communities

Review, and carry out necessary changes, in the legal provisions relating to citizens' access to courts for appeals. In all Acts, extend locus standi to all citizens. Make all laws and legal procedures much more accessible to local communities.

Justification: Most environment-related laws provide for citizens to appeal to courts of law, or use other legal means against violations. However, almost all have a limiting clause, which requires citizens to notify the relevant government agency several weeks before being able to approach the courts, and then be eligible only if the agency does not take action. This often allows the violation to remain unnoticed or weakly dealt with. Provisions like this need to be reviewed from the standpoint of making legal access to citizens more effective.

Suggested Responsibility: Ministry of Environment and Forests and the Ministry of Law and Justice, in consultation with experts on environmental law and civil society.

Time Frame: Review within one year; amendments or subsidiary rules/notifications thereafter.

Steps:

- i. Translate and make widely available, through local media and other means, all laws relating to biodiversity, decentralised governance and development; take special measures to disseminate these to *gram sabhas*, *panchayats*, and urban wards;
- ii. Create mobile courts or court benches, people's courts, and other such innovative mechanisms, to reach justice to people rather than force people to travel long distances to district/state/national courts;
- iii. Reconsider the *locus standi* clause of each relevant law, reducing or eliminating the period between a citizens' notice to a government agency and his/her right to approach the courts, especially in the case of violations and offences that require quick remedial action;
- iv. Extend *locus standi* in all environmental laws to all citizens; in the case of the Biological Diversity Act 2002, interpret the current provision of locus standi to 'benefit-claimers' so as to include all citizens.

4. Compile and Assess court Orders Related to Biodiversity, and Apply the Lessons Learnt

Compile, analyse, and distil lessons from court judgements that have had, or have the potential of, significant impacts relating to biodiversity and related livelihoods. This should cover especially the High Courts and the Supreme Court, but could also build on relevant judgements of lower courts.

Justification: Various decisions in the higher courts present regulations and directives which have a bearing on conservation in the country, and in many cases on livelihoods. It is important to analyse and draw lessons from these judgements, for use in assessing and changing statutory legislation and programmes related to biodiversity.

Suggested Responsibility: MoEF and National Law Commission, through institutions like National Law School, and relevant NGOs.

Time Frame: 2 years.

Steps:

- i. Make a list of reported judgements of the Supreme Court and High Courts with an emphasis on recent judgements, which deal with the utilization, regulation and control over natural resources, especially in the context of the statutes and Constitutional provisions described in Chapter 6 (see, for instance, SC judgement on wetlands, *Box 7.1.8.10*);



- ii. Analyse the above judgements from the point of view of:
 - a. Emerging fundamental norms within relevant litigation;
 - b. Definitions created by the Courts;
 - c. Whether 'environmental concerns' that have been addressed in the spate of litigation adequately after 1980 also address concerns pertaining to biodiversity conservation and sustainable use;
 - d. Strategies to be formulated about how to deal with 'problematic judgements' (revision petitions, amendments to the law etc);
 - e. An investigation and analysis of the implementation (or lack thereof) that has followed some of these judgements;
 - f. In the context of a selection of some of these judgements, a debate to be initiated, regarding whether or not Courts are the appropriate forums to deal with these issues, and related recommendations to be made;
- iii. Conduct an overall analysis of the legal system, especially elements that have a negative bearing on the environmental/biodiversity justice system. This would deal with procedural aspects of litigation at all levels; for example, the procedural aspects of the criminal justice system, and how they operate to victimize stakeholders as well as prove to be hurdles in bringing violators such as poachers to book.

Box 7.1.8.10 Using the Supreme Court Judgement on Wetlands

In 2001, the Supreme Court in *Tiwari vs. Kamala Devi and Others*, adjudicated on a matter involving the draining out and allotment of a wetland for the purpose of construction. It held that 'the material resources of the community like forests, tanks, ponds, hillocks, mountains etc. are nature's bounty. They maintain delicate ecological balance. They need to be protected for a proper and healthy environment which enables people to enjoy a quality life which is the essence of the guaranteed right under Article 21 of the Constitution. The Governments, including the Revenue Authorities...having noticed that a pond is falling in disuse, should have bestowed their attention to developing the same which would, on one hand, have prevented ecological disaster and on the other provided better environment for the benefit of the public at large.....the State shall restore the pond, develop and maintain the same as a recreational spot which will undoubtedly be in the best interest of the villagers.'

Groups in Nagpur and elsewhere are using this judgement as a precedent, to prevent wetlands from being built upon.

Contributed by Vidarbha Natural History Society (Nagpur Sub-state Site BSAP nodal agency)

5. Broad-Base Membership of Bodies Set Up Under Laws or by Courts

Ensure that all relevant stakeholders, and in particular affected local communities, are given membership of committees, authorities, and other bodies set up by courts, or under relevant laws (e.g. Coastal Zone Management Authorities, committees to administer or advise on Ecologically Sensitive Areas, the Supreme Court's Centrally Empowered Committee, the National Board for Wild Life, etc.).

Justification: More often than not, committees and authorities set up under laws or by courts are composed largely of bureaucrats, NGOs, and 'experts', while leaving out local communities and others that may have a direct stake in the issue under consideration. As an example, the Centrally Empowered Committee, set up under orders of the Supreme Court to look into forest and wildlife matters, has representation primarily of forest/environment officers and conservationists. These constituencies are obviously crucial for the task. However, as biodiversity issues are intrinsically intertwined with issues of tribal land rights and the constitutional protection provided to tribals/IPs in Schedule V & VI areas, the Ministries of Rural Development, Tribal Affairs, the Commissioner, Scheduled Castes & Scheduled Tribes, and representatives of state tribal advisory councils should also be represented on them. Respected women and men leaders, selected by the communities themselves, from Schedule V & VI areas should also be represented, together with legal experts on tribal rights and the Constitution.

Suggested Responsibility: Ministry of Law and Justice, and MoEF, High Courts, and the Supreme Court, in consultation with other ministries and state environment departments, as also relevant NGOs, peoples' groups/movements, and legal experts.

Time Frame: Two years for existing bodies, and ongoing thereafter for any new body.

Steps:

- i. MoJ and MoEF to set up expert group to review the current composition of such committees/authorities, and to suggest additions/changes;
- ii. Suggested changes to be made public and comments solicited;
- iii. Relevant government agency or court to include such additions/changes or other suggestions, based on comments received.

7.1.8.8 Strategy: Make all Governmental Information and Records on Biodiversity Publicly Accessible

Overall Justification: Public access to government records and documents, which are directly relevant to people's livelihoods, and natural resources to which these are linked, is extremely poor. For instance, crucial documents relating to development projects, including till recently the Environment Impact Assessment (EIA) reports, have not been available to citizens even upon asking for them. Most policies and acts need a much greater element of transparency, to enable truly effective participation in governance and in implementing these policies and acts. The Freedom of Information Act, 2002, should be followed up by all relevant agencies to enable such public access to information.

Actions

1. Integrate Right to Information in Biodiversity-Related Laws

As a long-term goal, review and amend legislation pertaining to the control, use or regulation of elements of biodiversity, especially to the extent that it effects the existing rights of citizens, to effectively include the right to information. Such a review would necessarily have to scrutinize the statutes and make recommendations for:

- a. Pro-active dissemination of relevant information, especially in local/regional languages;
- b. Clear designation of the authorities responsible for providing the information;
- c. Payments, if any, to be only for copying expenses, and not to apply to members of rural communities who are affected parties of a proposed or actual project or process;
- d. Speedy provision of information, with time limits for different kinds of information;
- e. Systems should be built into the existing procedures, for providing citizens with the required technical/legal assistance to understand the implications of government notifications, orders, and circulars;
- f. Appropriate punishments for officials who fail to provide information within the time specified, and with the convenience required by the Act.

Suggested Responsibility: MoEF, MoJ, Ministry of Rural Development, Ministry of Agriculture, and other relevant government agencies.

Time Frame: 3 years (simultaneous to *Strategy 7.1.8.3*)

Steps:

- i. Integrate the right to information, where not already provided for, into the following laws: Biological Diversity Act, 2002, Indian Forest Act 1927 (IFA), Forest (Conservation) Act 1980 (FCA), Wild Life (Protection) Act, 1972 (WLPA), Environment (Protection) Act, 1986 (EPA); Patents (Amendment) Act, Mines and Minerals (Development and Regulation) Act, 1957, Land Acquisition Act, 1894, and other relevant Acts, Rules, Regulations, Orders, and Notifications that may be identified at the Central, State, District and other levels;
- ii. Set up an efficient and transparent mechanism to implement this right, making it especially accessible to local communities that are affected by proposed or existing projects and processes;
- iii. Ensure that such access to information is not misused in the case of traditional knowledge, which is protected under relevant provisions (*see Strategy 7.1.5.5*).



2. Use the Freedom of Information Act to Take Measures for Public Provision of Information

Take measures under the Freedom of Information Act 2002, and related state acts, to disclose information relating to biodiversity and environment. This could be done in one or more of the following ways, as locally appropriate:

- On the internet
- In newspapers
- Through public hearings
- By placing the relevant documents in a locally accessible place, at district and state HQs and at the national level
- By making files and records available on request
- By making specific information available on request

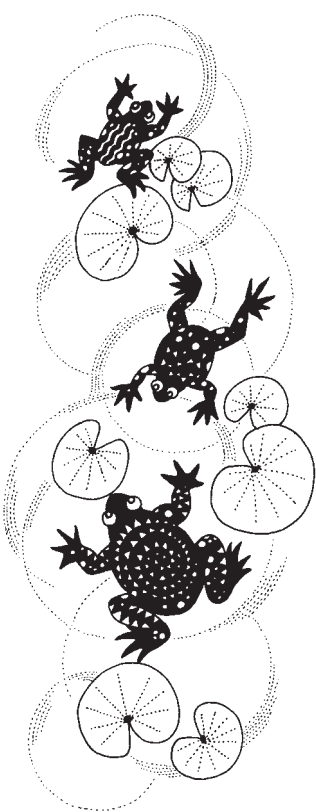
Suggested Responsibility: MoEF and other ministries and departments of central and state governments dealing with biodiversity.

Steps:

(adapted from Singh, undated)

- i. In the case of environmental clearance, take the following measures:
 - a. Public Hearings prescribed in the Environment Impact Assessment (EIA) notification, which flows from the Environment Protection Act (EPA), must be conducted in a more meaningful manner involving all those from among the population to be affected, and other concerned persons who want to participate.
 - b. The concerned government authorities must make the required arrangements to inform people about the hearing, which should be conducted at a time convenient to them.
 - c. The public meetings should be in two phases. In the first meeting the project must be described and explained to the people, through booklets and/or presentations in relevant languages. The following information should be provided preferably before, and necessarily at, the meeting:
 - Whether the environmental costs and the benefits of the project have been properly assessed;
 - Whether the planning, action and investments required to minimise the environmental costs have been taken care of;
 - Whether other, less destructive alternatives have been considered;
 - Whether various knowledgeable and/or concerned persons, including the people likely to be adversely affected, have been appropriately consulted, with scope for adequate preparation and information;
 - Whether the proposed project (or activity) is environmentally viable;
 - Whether its benefits justify the environmental/social costs that will be incurred;
 - Whether the level of human displacement involved is justified or can be prevented or minimised. Details on these aspects will be required to be given;
 - Whether adequate planning has been done and provisions made to appropriately rehabilitate the project-affected persons;
 - What, if any, are the conditions under which environmental clearance has been given?
 - Are the stipulated environmental conditions being fulfilled by the project?
 - What is the retrospective status of the project in terms of its environmental impact and its benefits, i.e. was the environmental clearance justified in retrospect?
 - Are the benefits of the project being equitably distributed, especially keeping in mind those who suffered the adverse environmental consequences?

The second meeting should be held after a week but no later than a month after first meeting, to record the views and objections of the people.
 - d. Where, despite public objections, environmental clearance is accorded to a project or activity, the public must be informed of the rationale and conditions of the clearance, through a public meeting and through the distribution of appropriate booklets in local languages, within three months of the clearance being accorded.
 - e. The details of the environmental impact statement and appraisal, and of the clearances and their rationale, must also be made available at the MoEF, in Delhi and in their regional offices, in English. These should also be made available at the concerned district headquarters, with all the designated information officers, and similarly at the concerned sub-divisional headquarter(s), in local languages.
 - f. The regional offices of the MoEF are required to monitor compliance with conditions of clearance. Their



annual compliance reports must also be made available to people at the sub-divisional, district, state, regional and national levels.

- g. Various bodies of the government, including the MoEF, the Comptroller and Auditor General and the Public Accounts Committee of the Parliament, are charged with the responsibility of assessing the various costs and benefits of projects and activities. Their reports, in so far as they are relevant to a specific project or activity, should also be made available for inspection and photocopying at the various designated levels.
- ii. In the case of **biodiversity conservation and wildlife management**, take the following measures:
 - a. Before an area is constituted into a national park, sanctuary, or reserved/protected forest, three months prior notice must be given to the affected populations and their views and objections, if any, heard and considered. The notice must be both through the distributions of booklets in local languages and through public meetings. At least a month's time must be given for the people to consider the implications, and a second public meeting should then be convened to listen to their views, that must be considered and efforts made to accommodate them as far as possible.
 - b. Similarly, proposals to grant protection to a species must also be considered only after the public has been informed, through the mass media, and their views and objections heard and considered.
 - c. The proposal to close up areas or protect species must make clear the scientific basis for doing so and spell out the proposed measures to conserve the site or species. All these must also be made public and public opinion considered.
 - d. Where a decision is finally taken to protect a site or species, there must be, in advance of this protection coming into effect, a public announcement regarding the dislocation such protection is anticipated to cause in the life of those communities who depend on such sites and/or species for meeting their basic needs. The measures that the government intends to take to mitigate such dislocation should also be announced. This information, along with the recommended investigation by the Collector, can be used to determine the level and type of dislocation at least for site-specific proposals.
 - e. While explaining and discussing with the people the proposal for closing areas or restricting access and use, the implications of this on the local communities and others who might depend on the area must be made explicit. Where one implication is the proposed relocation of people living within the area, the rehabilitation programme must also be explained in specific detail so that the people can consider it while formulating their responses.
 - f. Once an area has been given special protection status, there must be an annual publication of details regarding access and use allowed, giving names of the parties, the nature of permission and the rationale. This information must also be accessible throughout the year to any interested person.
 - g. The government must produce an annual status report for each of the protected areas and each protected species, outlining the threats, current status, conservation trends, and action taken during the year to protect the site and species. Whereas this information can be published in an aggregate form at a national level, it must be disaggregated at the state, division and site level.
 - h. A statement listing the violation of laws relating to biodiversity and wildlife conservation, and giving details including the identity of the suspect, the nature of violation and the action taken, must be published each year at national and state level. In addition, this information must be available in an updated form at each site, forest division and at the state forest headquarters.
 - i. Details regarding compensation cases must be made public each year by the concerned DFO/PA director. Also, such information must be accessible through the year, in updated form, at the divisional/PA headquarters.
 - j. Details of the budget for each division/PA must be published at the beginning of each year, in local languages, giving a scheme-wise break-up and the details of the scheme. At the end of the year there must be a public meeting where the expenditure incurred during the year is made public. This information should then be accessible for two years for anyone to examine or photocopy. The information should include details of casual employment.
- iii. In the case of pollution control, take the following measures:
 - a. Status of Pollution Control in the 'Locality'
The state Pollution Control Boards must make public through the printed and electronic media, through published booklets and, in rural areas through public announcements, the following information:



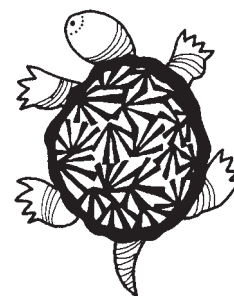
- Air, water, land and noise pollution levels, indicating deviations from the norm, specifically for each locality,
 - The possible impacts on human health and the environment, and causes and sources of such pollution
 - Government action and possible action by the people
- b. Information Regarding Specific Sources of Pollution
- In addition to the above described, the following information should be made available in the same manner as has been described above:
- Names, locations and the nature of possible pollution from each industry or enterprise, along with details of the no-objection and compliance certificates along with the conditions, plus details of any new units once every month.
 - The frequency and results of monitoring, action that government is taking and action that the people can take. This should be done once a year for all those likely to be affected except where the standards are violated. In such cases, once a week till such time that the violations are stopped.
 - In addition, the Pollution Control Boards must periodically make public all the various standards prescribed, their rationale, and indicators that can demonstrate easily to the lay person (through smell, taste, sight etc.) when the standards are being violated.
- c. Enquiries and Information
- In addition to this information that the government must obligatorily make public, there has to be an institutional mechanism that can answer queries and provide information on request. For the purpose, the state government should designate an environmental information officer in every sub-division. Where officers of the pollution control board or the department of environment are not available, forest or other officers may be given the responsibility of entertaining enquires from the public. These enquires can be passed on to the board or department and the responses fed back.
- All information relevant to the prevention and control of pollution, or relating to ambient or source-specific pollution levels, and to the nature of pollution, its impacts, government action and possible action by the people should be accessible to everyone. The only exception could be information that is protected by law and whose publication would violate the patent rights of a company or individual, provided that the withholding of such information does not, in the opinion of the designated authority, endanger public safety or environmental integrity.
- d. Information to Public Authorities
- Civil authorities, the police and, in the case of cities and towns, the municipal authorities must also mandatorily be provided, by the holder or user of such substances or processes, complete information regarding the nature and severity of possible pollution, its indicators, effects on humans and on the environment, and preventive, integrative and curative measures.
- The pollution control boards must also inform such bodies every time either ambient or source-specific levels of pollution have exceeded the prescribed standards. Where such pollutants are of immediate danger to human health or the environment, this information must be provided on a daily basis till such time as the prescribed levels have been restored. When the danger is only if the pollution levels remain high for a prolonged period (of at least one month), then weekly alerts must be given.
- Hospitals and other medical institutions, including registered medical practitioners, must be provided complete information about possible adverse impacts of the pollutants on human health, the nature of these pollutants and the mitigatory and curative methods available. Where such pollutants are source-specific to an industry or enterprise, the provision of such information should be the legal responsibility of the holder or user of the substance or process. Where it is not source-specific, the pollution control board should ensure this.
- e. Chemical and Nuclear Hazards
- Where hazardous substances are being used, stored or transported, it is obligatory on the part of the concerned agency/pollution control board, to inform all those who might be affected about the nature and location of the hazardous substances being used, stored or transported, their possible impact on human health and/or on the environment, the details of possible leaks or exposure and the indicators thereof, the preventive steps being taken by the government, and the preventive, mitigatory or curative steps that can be taken by the people. Such information should also be provided to the civil



authorities and other concerned government agencies, and to hospitals and other medical facilities and registered doctors.

Where an industry or enterprise is using hazardous processes, even if it does not involve hazardous substances, similar conditions should apply.

- iv. In the case of forestry clearance, the following information should necessarily be made available to citizens in connection with any move by the government to divert forest land for non-forest purposes:
 1. Detailed guidelines specifying the criteria used to evaluate requests for diversion of forest lands must be published in English, Hindi and other major languages.
 2. Where a proposal for diversion has been received, public hearings must be organised in the prescribed manner, before environmental clearances are given.
 3. The information regarding the proposed forest area, including details of its ecological profile, its social value and proposed use should be publicised.
 4. A copy of the state government's certificate that non-forest land is not available for the purpose must also be made public at the public meeting and made accessible at the various designated levels.
 5. Where a proposal has not been disposed of within three months, a statement giving the time taken at various levels for processing the proposal should be made public within four months of the submission of the proposal and every three months thereafter, till the proposal is finally disposed of.
 6. Where a case has been approved or rejected, the basis for the decision must be made available at the levels earlier specified.
 7. Monitoring reports prepared annually by MoEF, assessing the level of compliance, must also be made available at the various levels within two months of the end of the reporting period.



7.1.9 Wild Biodiversity: Strategies and Actions Relating to Financing

(**Note:** Many of the recommendations below also pertain to agriculture, and the strategies/actions in *Sections 7.1.9 and 7.2.9* in particular relate to both wild and domesticated biodiversity. Also, this section needs to be seen in conjunction with other sections of this chapter, in particular those relating to equity (*Sections 7.1.5 and 7.2.5*) and governance structures (*Section 7.3.3*). It should be stressed that financial measures, while important, are not the most critical steps towards conservation, sustainable use and equity.)

Overall Strategies:

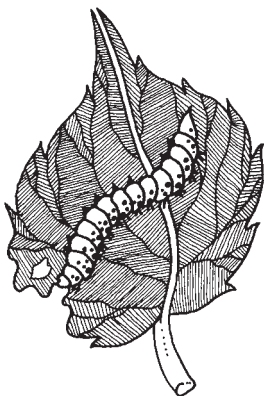
1. **Review macro-economic policies and programmes** that have a significant biodiversity impact, and modify them towards greater ecological sensitivity; this would include policies/programmes of liberalisation, disinvestment, 'single-window' clearances, trade, taxation and tax breaks, globalisation etc.;
2. **Phase out perverse incentives** like subsidies on chemicals and other ecologically destructive products/processes, and replace them with positive incentives for ecologically sensitive materials, processes and products;
3. **Infuse a biodiversity perspective into national and state budgets**, building in natural resource accounting/budgeting, and ensuring adequate amounts for conservation, sustainable use and equity measures;
4. **Raise funds through innovative means**, such as biodiversity taxes on urban citizens, biodiversity-using industries, and tourists, trust funds, donations and investment by charities, corporate sector, NGOs, religious/spiritual bodies etc., and reorientation of the policies/programmes of financial institutions such as banks, insurance companies, etc.;
5. **Empower local governance bodies to raise and control funds**, including those given to them through central/state budgets.

7.1.9.1 Strategy: Review Macro-Economic Policies, Programmes and Incentive Systems, from the Point of View of Biodiversity

Actions

1. Assess Macro-Economic Measures from a Biodiversity and Livelihoods Perspective

(see also Strategy 7.1.9.3, Action 1)



Assess, and suggest changes to, the macro-economic policies and programmes that are currently causing the loss of biodiversity and disruption of biodiversity-based livelihoods.

Justification: A host of macro-economic policies and programmes in India, including those related to liberalisation, disinvestment, 'single-window' clearances, trade, taxation and tax breaks, globalisation etc., are having a significant impact on biodiversity, including pressures for relaxing environmental regulations and standards. They also do not enhance or protect the livelihood security of small farmers, fisherfolk, forest-dwellers, and others directly dependent on biodiversity. While some indications of these impacts exist, there is no comprehensive and systematic assessment, and very few measures to tackle the adverse impacts. This is one of the most critical steps to be taken if India's biodiversity and related livelihoods have to survive.

Suggested Responsibility: Ministry of Environment and Forests, in association with the Ministries of Finance, Economic Affairs, and other relevant ministries; study to be commissioned to an organisation like the Indian Society of Ecological Economics with an independent, publicly transparent mandate.

Time Frame: Two years for study; ongoing for implementation steps thereafter.

Steps:

- i. Commission an independent study by an organisation such as the Indian Society of Ecological Economics to systematically analyse the full range of macro-economic and market-based measures, including the ones listed above, with a view to assess their current and potential impacts on biodiversity and biodiversity-based livelihoods, and to suggest steps for reorienting the measures and mitigating the current impacts; the study should also assess the different strategies that may be required for aquatic and terrestrial biodiversity;
- ii. Put into place publicly transparent mechanisms, including those listed in actions below, to phase out the macro-economic measures that adversely impact biodiversity and related livelihoods, and to replace them by positive measures that promote conservation, sustainable use, equitable use and benefit-sharing, and genuinely sustainable development.

2. Phase Out Perverse Subsidies

Over a period of 10 years, phase out all subsidies and financial incentives, which are perverse in that they are inimical to biodiversity and to biodiversity-based livelihoods.

Justification: Today, several ecologically damaging subsidies and financial incentives are provided to the agricultural, industrial, and services sectors. Subsidised fertilizers and pesticides, agricultural packages with hybrids and chemicals, tax incentives for industries in so-called 'industrially backward areas', subsidies for industrial wood and other raw materials such as bamboo, and other such financial measures are seen as helping development, but in the long run actually undermine the conditions for sustaining development. Part of this is because they degrade the environment on which the subsidised activity itself is based, or have other negative impacts on livelihoods based on natural resources. Given the structure of our society and the serious loopholes in such measures, they also often get cornered by the already privileged sections of society. It is therefore critical to phase such subsidies and incentives out, and replace them by positive incentives that promote biodiversity-based livelihoods and sustainable forms of development (see also *Action 2* on positive financial incentives). While so doing, it is essential to keep equity considerations in mind, especially to ensure that the poorer sections of society do not suffer in the transition phase.

Suggested Responsibility: Ministry of Finance and Company Affairs, in coordination with the relevant sectoral ministries, such as Agriculture, and Environment and Forests; and in collaboration with agencies like the Indian Society of Ecological Economics and relevant NGOs.

Time Frame: Study in one year, phasing out in 10 years.

Steps:

- i. Commission an independent study by an organisation such as the Indian Society of Ecological Economics,

to identify and analyse all perverse incentives that impinge on biodiversity and biodiversity-based livelihoods, to suggest steps to phase out and replace by more positive incentives, and to prioritise amongst these steps;

- ii. Integrate into the ongoing 10th Plan process the steps needed to phase out perverse incentives;
- iii. Integrate, into the steps suggested here, adequate provisions for alternative livelihoods, and other ways to offset the potential impacts, especially on small farmers, adivasis, and others who may not have the resources and capacity to deal with the transition phase between perverse incentives and positive ones;
- iv. Empower the relevant ministries and state governments to undertake the phase-out process;
- v. Monitor the implementation of these steps, with full public transparency and right to information on the steps.

3. Introduce New (and Widen Existing) Financial/Fiscal Incentives for Biodiversity

Strengthen and spread existing financial/fiscal incentives for biodiversity conservation, and introduce new ones in areas or themes not already covered. This should include incentives for, among others:

- i. Pollution-avoidance and control measures;
- ii. Community-conserved ecosystems and species, and other citizens' efforts at conservation;
- iii. Biologically diverse and organic farming (including plantations such as tea and coffee);
- iv. Small-scale sustainable fisheries in inland and marine areas;
- v. Sustainable bioresource-based enterprise (including for artisans);
- vi. Alternative, ecologically friendly or clean technologies and processes in energy generation, use, and distribution; biomass use for energy, construction, and production; and water harvesting and distribution;
- vii. Recycling and re-use, especially of materials whose production and/or disposal is ecologically damaging;
- viii. Conservation-related technologies, such as radio telemetry, whose costs are still very high partly due to lack of adequate R&D.

Justification: As in *Action 1* above. Also, as India's 2nd National Report to CBD points out: 'India has a repertoire of economic incentives with a bearing on utilisation of biological resources; however, these traditional economic mechanisms are oriented more to 'revenue raising' and biomass augmentation, and are not necessarily oriented towards conservation.'

Suggested Responsibility: As in *Action 1* above.

Time Frame: As in *Action 1* above.

Steps: Modified from *Action 2* above.

7.1.9.2 Strategy: Reorient National and State Budgets

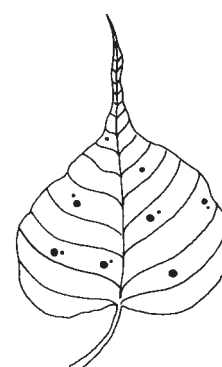
Actions

1. Assess Central and State Budgets from a Biodiversity and Livelihoods Perspective, and Introduce the Necessary Changes

(Details as under *Strategy 7.1.9.1, Action 1*, with the same agencies responsible and the same proposed study by an organisation like the Indian Society for Ecological Economics, encompassing this action as well; see also *Strategy 7.1.7.1*)

2. Introduce Natural Resource Accounting/Budgeting into the National and State Budgets

Integrate, into national and state budgets, realistic and credible estimates for the contribution of biological (and other natural) resources to India's economy, and the economic losses suffered due to biodiversity and other ecological destruction. Such estimates should be arrived at through widely accepted methodologies, and it should also be accepted that they are only approximations, not necessarily reflecting the true values, and not necessarily bringing out the very many critical qualitative values that are non-measurable.



This entails accounting of the natural resources of states, 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 an approach would help mitigate and minimise ecological disasters – drought, for example. The capacity-building required for formulating such environmental agenda could be provided through the Ministry of Environment and Forests (MoEF), and relevant institutions and NGOs.

Justification: Current national and state budgets do not reflect the true magnitude and range of contributions that biodiversity and other natural resources make to the economy. As a result, these resources are always given short shrift in deciding economic planning priorities. A number of official pronouncements have been made on this, but with little actual progress (see Box 7.1.9.1).

Box 7.1.9.1 Policy Support for Natural Resources Accounting/Budgeting

The Policy Statement on Environment and Development stipulates that economic growth indicators like GNP and GDP would include depletion costs of environmental resources, that the Government would prepare a natural resources budget every year, 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. National income calculations do not reflect environmental degradation or consumption of natural resources. National income accounting without environmental 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.

Under the Environment (Protection) Act, 1986, the Central Government has wide powers to take measures to protect and improve the environment. It 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, in order 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 at times even prevent ecological disasters such as drought. The capacity-building required for formulating such environmental agenda would have to be provided through the Ministry of Environment and Forests (MOEF), and relevant institutions, NGOs, and community organisations.

The National Forestry Action Plan states that 'in order to fully and realistically recognise the value of forests, it is necessary to take all the direct and indirect values and benefits of forests into account through a system of environmental economic accounts, in a satellite accounting framework within the system of National Accounts.'

Suggested Responsibility: The Planning Commission, along with groups like the Indian Society of Ecological Economics, state planning departments, and other independent economics and ecology experts at state and national levels.

Time Frame: By the 11th 5-year Plan.

Steps:

- i. Planning Commission to set up a working group to conduct a natural resource accounting/budgeting exercise for all key ecosystems and ecoregions of the country (including river basins, hill ranges, coastal/marine stretches, and freshwater wetland systems with their catchments), taking on board the ecosystem valuation action suggested in *Strategy 7.1.1.1, Action 4* above; in so doing, the working group should assess and learn from past and ongoing attempts at natural resource accounting/budgeting, such as the multi-organisational exercise for the Yamuna basin (see *Section 6.1.1.2*), and reports such as those of the Task Force on

Conservation and Sustainable Use of Medicinal Plants, Planning Commission, and the Planning Commission Task Force on Greening India for Livelihood Security and Sustainable Development;

- ii. Planning Commission and state planning departments to integrate the figures arrived at, of both assets and losses, into the national and state budgets being prepared for the 11th 5-year Plan, or earlier where possible;
- iii. Present to the public, an annual national and state-level natural resource account/budget, along with the conventional national/state budget; build such a requirement into legal measures under the Environment Protection Act;
- iv. Integrate the above estimates into the National Accounts Statistics;
- v. Organise, for the above to be done effectively, training sessions for officials of the state planning departments and other institutions, on ecological economics.

3. Enhance the Biodiversity Budgets at Centre and State

Significantly enhance the budget for biodiversity and related livelihoods, in the central Ministry of Environment and Forests, and in relevant environment/forest/biodiversity departments of state governments. The increase should be based on criteria such as:

- i. Area covered by various natural ecosystems in the country and in each state;
- ii. Number of plant/animal species in each state or region;
- iii. Number of people dependent on these ecosystems and their constituent species;
- iv. Value of ecosystem benefits provided;
- v. Level of past and ongoing neglect (e.g. fields like micro-organisms, taxonomy, community-based conservation, etc.).

This increase should also be accompanied by guidelines to ensure that the budget spending is increasingly done through institutions of decentralised governance, NGOs, institutions etc., and not only through government agencies.

Suggested Responsibility: Planning Commission, in consultation with relevant ministries and departments, and using the expertise of appropriate NGOs and institutions that have worked on ecological economics, including the Indian Society for Ecological Economics, as also ecology/biodiversity experts.

Time Frame: By the 11th Plan period.

Steps:

- i. Planning Commission to set up an expert group to identify criteria by which biodiversity budget allocations could be determined, including the ones mentioned above, and to suggest guidelines for more decentralised, publicly transparent use of these allocations;
- ii. Hold consultations with relevant ministries and departments, and with relevant non-governmental and PRI sections, to decide upon the allocations and the guidelines;
- iii. Allocate, where possible during the 10th Plan and definitely by the 11th, significantly enhanced resources to the Ministry of Environment and Forests, and relevant state departments;
- iv. Disburse the funds as per the guidelines determined above, in a way that significantly empowers decentralised governance institutions and other non-governmental sectors.
- v. Allocate, till the above report and measures are taken, 3% share of total revenue expenditure and another 3% share in capital expenditure exclusively for natural resource conservation and sustainable use in the states; also, allocate at least 6% of GDP to MoEF, for all activities including biodiversity, and 3% exclusively for ecosystem and species conservation including protected areas and community conservation areas [*Economics and Valuation of Biodiversity Thematic BSAP*];
- vi. Allocate at least 15% of the country's forest budget, and appropriate share of budgets related to other ecosystems, for wildlife conservation and other related issues.
- vii. Prepare a document justifying and urging enhanced allocations for biodiversity (including wildlife) conservation, as stated above, for submission to the National Development Council, Planning Commission and Ministry of Finance.



4. Integrate a Biodiversity Budget Line into Each Ministry/Department

Introduce, where not already existing, a head on biodiversity into the budgets of each ministry and department at central and state levels.

Justification: Current budgeting is compartmentalized, in that all conservation and sustainable use activities are supposed to be carried out by a single ministry or department. Inter-sectoral integration, as laid out in *Section 7.1.7*, requires that such compartmentalisation be reduced or eliminated. One step towards this would be to have a dedicated budget for biodiversity within each ministry and department, oriented towards ensuring that its development or welfare or other activities are either leading to conservation and sustainable use, or are adequately compensated by appropriate remedial measures.

Suggested Responsibility: Each Government of India Ministry, and each state department

Time Frame: If possible, within 10th Plan period; otherwise by 11th Plan

Steps:

- i. Take a central decision to create a biodiversity head in the budget of each ministry and central government department;
- ii. Issue a central circular for all states to follow suit.

5. Provide Special Budgetary Consideration for Ecologically Fragile or Critical Areas

Prioritise, in budgetary allocations, areas that are ecologically fragile or critical from the point of view of regional or national ecosystem benefits, including hill and mountain ranges, coastal/marine stretches with coral reefs and mangroves, large (urban and rural) wetlands, areas with high or unique agro-biodiversity, etc. Ensure that the enhanced budgets are used for ecologically and socially sensitive development.

Justification: Ecologically fragile and critical areas are often underprivileged in having smaller human populations and less political clout, and hence do not receive adequate attention in national or state planning and budgeting. It is important to make special provisions in the State and Central budgets for ensuring conservation, and genuinely sustainable and equitable development in such areas. There have been a number of expert groups that have recommended appropriate steps towards this, e.g. those set up by the Planning Commission on hill areas and the Himalaya; but these recommendations remain largely unimplemented. Conventional schemes, especially those provided when such areas are declared 'industrially backward' or in other ways underprivileged, tend to be largely destructive of biodiversity and related livelihoods and cultures. There are some special schemes and programmes, e.g. the Hill Areas and Western Ghats programmes of the Planning Commission, whose stated objective is ecologically sensitive development, but the actual projects that are funded under these remain in the conventional rural development mould (Kothari 2001). This needs to be changed, by providing budgets and guidelines that truly help to conserve the natural characteristics of such areas while providing the necessary developmental and welfare inputs to their people.

Suggested Responsibility: Planning Commission and state planning departments, in association and consultation with other ministries/departments, NGOs, environmental institutions, and community institutions in/of the areas concerned.

Steps:

- i. Based on ongoing studies and those proposed in *Strategy 7.1.1.1*, evaluate the full ecological, social, and economic benefits being derived from ecologically fragile and important areas in India, including the areas identified as being of critical importance to wild and agricultural biodiversity; all areas declared as protected or ecologically sensitive under the Wild Life (Protection) Act, Environment Protection Act, or Biological Diversity Act; all areas declared under special schemes such as Biosphere Reserves; coral reefs and mangroves; all community-conserved areas; culturally sensitive areas including adivasi belts, etc. (*see Strategies 7.1.2.1 to 7.1.2.3, and 7.1.2.1*);



- ii. Publicise these benefits in areas surrounding these sites/regions, and amongst planners/decision-makers for each site/region;
- iii. Develop special schemes and financial packages for these areas, with guidelines that ensure that the budgeted plans are sensitive to their ecological, livelihood, and cultural features;
- iv. Orient existing schemes and programmes under operation in these areas – including those declared specially for such areas like the Planning Commission's Hill Areas and Western Ghats Programmes – towards ecological, livelihood, and cultural sensitivity;
- v. Set up appropriate institutional structures (see Section 7.02 on Governance Structures), and take appropriate legal steps (see Sections 7.1.8 and 7.2.8), to ensure that all development programmes in these areas are in tune with their unique and critical features.

Ongoing Relevant GOI Schemes/Programmes:

- The Hill Areas Development Programme and Western Ghats Development Programme, Planning Commission
- MoEF programmes: (i) Survey of Natural Resources (ii) Biodiversity Conservation, (iii) Coral Reefs (iv) Mangroves (v) Wetland (vi) Biosphere Reserves under Conservation of Natural Resources Including Forestry and Wildlife.

6. Provide Special Funds for Preventing and Compensating Wildlife-Related Damage

(Link to Section 7.1.2.8).

Fund special measures to prevent and reduce wildlife-related damage, and strengthen the mechanism of compensating for such damage, including damage to health and property. In particular, institute mechanisms to centrally involve local community institutions, NGOs and other organisations in such actions, and to take appropriate action against officials and other functionaries who knowingly delay payment or otherwise cause harassment to deserving claimants.

Justification: In face of the enormous magnitude of wildlife-related damage to life and property (*Wildlife-Human Conflicts Sub-thematic Review*), ongoing attempts at tackling this issue are seriously inadequate. Much of the attention has been focused on compensating for the damage, but mechanisms of paying compensation to farmers, pastoralists, forest-dwellers, fisherfolk, etc., are clumsy and inadequate. Problems relate to the amount of compensation being low, payment being bureaucratic and difficult to access, especially for villagers with social and economic disabilities, claimants having to pay bribes and take other illegal or inconvenient steps to obtain the compensation, and, in most states, no crop compensation policy. The result of this inadequacy and inappropriateness is that often people do not get compensated and are therefore the sufferers, who then turn hostile to conservation efforts and conservation personnel. Innovative mechanisms, such as quick NGO or community-managed payment of compensation, now exist to get over these problems, and should be built upon. Equally if not more important is the need to tackle the root causes of wildlife-human conflicts (see Section 5.2), and to direct funding and action at preventive measures.

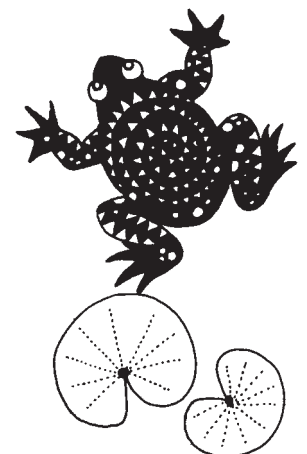
Suggested Responsibility: Ministry of Environment and Forests, and relevant State Government departments (including wildlife, environment, rural development, tribal welfare), in collaboration with local community institutions and NGOs working in the relevant sites.

Time Frame: Two years for setting up mechanisms; ongoing thereafter

Steps:

(see also actions suggested in Section 7.1.2.8)

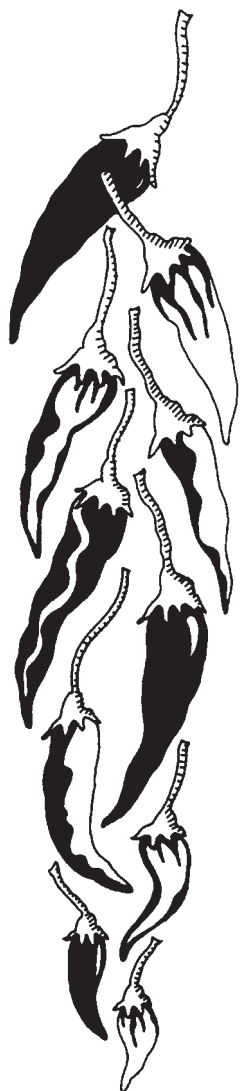
- i. Commission a detailed, state-wise survey of the extent of wildlife-related damage for each major species involved, the historical and current causes of this damage, and the traditional and new ways of tackling this conflict;
- ii. Enhance the budgets of wildlife wings and departments in each state where the damage is extensive, to fund



- innovative preventive and mitigatory activities, and for compensation in cases where the damage is unavoidable;
- iii. Build on innovative measures such as the quick compensation initiative of WWF, Corbett Foundation, and other organisations (*see Box 6.22 and Section 6.1.9.2*);
- iv. Institute a crop and livestock insurance scheme in all relevant states;
- v. Provide institutions of local governance with the financial and administrative capacity to verify and handle damage cases on their own, with due checks and balances against misuse.

Ongoing Relevant GOI Schemes/Programmes:

MoEF's programmes: (i) National Wildlife Action Plan, (ii) Project Tiger, (iii) Beneficiary-Oriented Scheme for Tribal Development Objectives and Components, (iv) Eco-development Scheme in and around National Parks and Sanctuaries including Tiger Reserves, (v) India Eco-development Project, and, (vi) Project Elephant.



7. Advocate the Above Changes at the Political Level

Lobby and advocate the changes in financial measures, including the enhancement of biodiversity-related budgets and the re-orientation of other budgets, at the political level at the centre and in states.

Justification: Given the low level of importance given to biodiversity (and to ecological issues in general), there is a need to create greater awareness amongst, and lobby with, decision-makers. In particular, the various critical values of biodiversity, including those described in *Section 4.2*, need to be highlighted.

Suggested Responsibility: NGOs and individual ecological economists, and community organisations, through relevant forums including the Parliament Standing Committee on Environment and Forests at the centre, and appropriate forums at state level.

Steps:

- i. Seek and organise special consultation sessions with MLAs and MPs, including with the Parliamentary Standing Committee on Environment and Forests;
- ii. Develop submissions/presentations to Planning Commission, to influence decisions on prioritisation and budget allocation;
- iii. Lobby the National Development Council to ensure that the importance of environmental integration as part of sustainable development is accepted and promoted within the Five-Year Planning process and by the sectoral groups;
- iv. Develop appropriate briefs for MLAs and MPs, explaining the importance of biodiversity integration into the budget.

7.1.9.3 Strategy: Financially Empower Institutions of Local Governance

Actions

1. Financially Empower Governance Institutions at Community Level

Ensure that institutions at various levels of decentralised governance, starting from the smallest viable decision-making units (*see Section 7.3.3*), are financially empowered. This should include the right to generate and control their own financial resources through the sustainable and equitable use of natural resources, the right to secure and control public funds, a committed share of funds from state and central governments, and the power to decide upon the priorities by which various line departments should spend their budgets in the area under their jurisdiction.

Justification: The Panchayati Raj constitutional amendments have provisions for financially empowering local community level institutions. However, several years after coming into force, most states have not moved substantially towards such empowerment, with centralised line agencies still holding the reins. Decentralised

governance systems, which the country has already professed its intention to move towards (see also Section 7.1.5 and 7.2.5), can only be fully effective if financial autonomy and powers are also decentralised to the smallest level of governance.

Suggested Responsibility: Ministry of Rural Development, Ministry of Finance, MoEF, and relevant state governments departments.

Time Frame: Five years

Steps:

- i. Implement Article 243(I) of the Constitution, which provides for the constitution of a State Finance Commission (SFC) to review the financial position of *panchayats* and to make recommendations regarding principles governing devolution of financial powers to PRIs.
- ii. Clearly specify the functional and financial autonomy of PRIs, and issue detailed instructions and guidelines to concerned departmental officers in this regard; this should include strategies to enable them to eventually become financially self-sufficient, at least for critical functions.
- iii. Financially strengthen District Planning Committees (DPCs), as envisaged under Article 243 (Z) and (D) of the 74th Constitutional Amendment Act, to facilitate the process of decentralised planning.
- iv. Ensure that, in all schemes and programmes that attempt inter-departmental coordination or integrated natural resource management (such as the Forest Development Agency programme), the lowest level of Panchayati Raj decision-making is financially empowered to be able to manage its own natural resources.
- v. Take legal and administrative measures to enable PRIs to generate their own resources, from the sustainable and equitable use of natural resources, and from the use of indigenous knowledge and skills. This should include fees for biological resources and biodiversity-related knowledge accessed by outsiders, as provided for in the Biological Diversity Act.
- vi. Set up, in each settlement, a biodiversity fund, to be managed democratically and with principles of conservation and equity (as provided for in the Biological Diversity Act). This fund should be generated through the above steps and through donations from outside (including a mandatory allocation from state and/or central budgets), and should be used for conservation, sustainable resource use, appropriate development, and compensation for residents who suffer due to biodiversity-related actions.



Ongoing Relevant GOI Schemes/Programmes:

- MoEF's National Afforestation and Eco-development Board set up under Regeneration and Development Programme, MOEF
- MoRD's (i) Integrated Wastelands Development Programme, (ii) Integrated Wastelands Development Programme, (iii) Technology Development Extension and Training (TDET) under Other Schemes of Wasteland Development.

7.1.9.4 Strategy: Generate New and Innovative Financial Resources for Biodiversity

Justification: Existing financial resources, even with the steps taken above, may not be adequate for the various strategies and actions specified in this action plan. There is a need to generate additional resources through innovative mechanisms. This should include contributions from all those sections of society, such as bioresource-based industries, urban consumers of biodiversity-based products, beneficiaries of ecosystem benefits, etc., who enjoy the benefits of biodiversity without paying for its conservation and sustainable use. (Biodiversity-dependent small farmers, adivasis, fisherfolk, pastoralists, and artisans should be excluded from this.) Appropriate financial measures will not only generate finances, but also help in raising biodiversity awareness amongst such sections of society, many of whom are ecologically illiterate.

Actions

(see also Box 7.1.9.2, for innovative mechanisms suggested by some states under the NBSAP)

1. Introduce an Ecosystem Service tax in Urban Areas

Institute an ecosystem service tax in each city/town, to be charged to all those who are in the income tax bracket; the proceeds of this are to go directly into the upkeep of catchment areas, wetlands, and other ecosystems that provide tangible and intangible ecological services to each city or town.

Justification: Most city-dwellers who benefit from ecosystem benefits (e.g. Mumbai's residents who get a substantial part of their drinking water from reservoirs that are protected by the Tansa, Borivali, and other catchment forests) are neither aware of this connection, nor pay for the upkeep of the relevant ecosystems. A small but widely applied tax would both generate resources and create awareness.

Suggested Responsibility: Ministry of Finance and Company Affairs, Ministry of Environment and Forests, and Ministry of Urban Development, in collaboration with state governments and urban authorities for each city/town.

Time Frame: Two years.

Steps:

- i. Commission an independent study by expert ecological economists and urban planners, to suggest the precise methods by which such a tax could be instituted;
- ii. Issue a central notification, under the relevant financial or environmental law, for all urban authorities to impose such a tax;
- iii. Constitute transparent participatory tax-collection procedures to implement this notification;
- iv. Channelise the proceeds to the institutions that are managing the ecosystems providing the services, with the specification that the funds are to be used to maintain and enhance the ability of the ecosystems to continue providing these services.

2. Introduce an Industrial Tax for Biological Resource and Ecosystem Use

Institute a tax on the profits of all industries that use biological resources or ecosystems as raw materials, or as suitable locations, or for other benefits that are not fully paid for. Examples include:

- i. Pharmaceutical industries that access medicinal plants from the wild, as well as related knowledge of local communities;
- ii. Cosmetics industries that access wild plants and related community knowledge;
- iii. Mineral or drinking water bottling companies that source water from hill streams or other such natural sources;
- iv. Seed industries that access seeds and related community knowledge,

Justification: In most, if not all, cases, industries that use biological resources and related knowledge do not pay the full value of these. The hidden and sometimes explicit subsidies that such industries thereby receive need to be offset by reclaiming some of their profits and repatriating these back into the conservation and sustenance of biodiversity and of related livelihoods.

Suggested Responsibility: Ministries of Finance and Economic Affairs, in consultation with the Ministry of Commerce, Ministry of Environment and Forests, and independent ecological economists.

Time frame: Two years.

Steps: Modify from Action 1 above

3. Introduce a Tourism Tax for Biological Resource and Ecosystem Use

Institute a tax on the tourism industry, which uses biological resources or ecosystems as suitable locations, or for other benefits that are not fully paid for. Examples include tourism to wilderness and culturally unique areas.

Justification: In most, if not all, cases, tourists, tour operators and the hotel industry do not pay the full value of



the services they get from natural ecosystems and other elements of biodiversity. Some states even provide financial incentives to set up tourism facilities in such areas, with the assumption that development of the region will take place. The hidden and explicit subsidies that tourism thereby receives need to be offset by reclaiming some of their profits and repatriating these back into the conservation and sustenance of biodiversity and related livelihoods, and sustainable development inputs to the areas being used.

Suggested Responsibility: Ministries of Tourism, Finance and Economic Affairs, in consultation with the Ministry of Environment and Forests, independent ecotourism agencies and ecological economists; at state and local levels, through local community institutions and NGOs.

Time Frame: Two years.

Steps: Modify from Action 1 above

4. Forge Agreements Amongst States (and Regions Within States) to Pay Appropriate Compensation to Each Other for Ecosystem Benefits and for Ecological Damage Caused

(Note: The need for such a step has been recently voiced by some Himalayan states, e.g. see *Arunachal Pradesh State BSAP*. Additionally, some indication has been given by the Supreme Court in a recent directive ("Order prohibiting felling of trees (as per approved Working Plans) without ensuring regeneration", I.A. No. 424, dated 22.9.2000): "Majority of the States in India fall short of national average as far as the forest cover is concerned. For the benefit of the said States also and for the benefit of the whole region, it is important that there should not be any further depletion of the forest cover in these sensitive areas of Madhya Pradesh and in the Himalayas and the other sensitive areas like the Western Ghats etc. In order to ensure the preservation and regeneration of natural ecosystems (including forests) in these areas, the Central Government should consider whether the deficient States should not be asked to contribute towards the preservation of the existing forest cover and compensation/incentive given to the forest-rich States to preserve and regenerate forest. In a sense, there should be a partnership of all the States to ensure the maintenance and improvement of the forest cover. This suggestion should be considered by the Committee of the Secretary (Finance) and Secretary, Ministry of Environment and Forests in consultation with the Chief Secretaries of all the States and a report submitted preferably within eight weeks.")

(see also Section 7.1.1.1, Action 4).

Assess the ecosystem and biodiversity benefits received by one state or region from another as well as the losses incurred by one state or region when biodiversity is destroyed in another, and introduce measures to enable inter-state and inter-region payment of compensation for such positive or negative impacts. In particular (but not exclusively), the following situations need to be taken into account:

- i. Water and soil security provided by upstream and hill states or regions to downstream, plains states (e.g. the Western Himalaya in J&K, Himachal and Uttaranchal to the Gangetic Plains in Haryana, Punjab, and Uttar Pradesh; Western Ghats part of Maharashtra to the state's plains below the Ghats; or the Eastern Himalaya in Arunachal Pradesh to the fertile plains of Assam);
- ii. Floods, siltation, and other impacts caused in a downstream state by ecological damage in upstream states;
- iii. Inter-state pollution impacts;
- iv. Divergent or different economic policies, or other laws and policies, that create inter-state problems of poaching, illegal fishing, or other threats to biodiversity.

Suggested Responsibility: Ministry of Finance, Ministry of Environment and Forests and Planning Commission to initiate agreements amongst states; state governments to initiate agreements amongst regions with the state; both these to be done in consultation with relevant NGOs and independent experts, and communities that live near or cut across such boundaries.

Time Frame: 5-10 years.



Steps:

- i. Set up an inter-state and inter-regional Ecological Compensation Task Force, to identify and enumerate the value of the services provided (or losses inflicted) in each of the above mentioned situations;
- ii. Introduce appropriate agreements amongst the state and regions concerned, to enable the regular and prompt payment of compensation as assessed above;
- iii. Set up a publicly transparent monitoring mechanism to track and update the compensation rates and procedures, and a dispute resolution mechanism to resolve conflicts and differences of opinions, or non-payment of due compensation.

5. Introduce Innovative Funding and Fund Management Mechanisms

Investigate the feasibility of, and create as appropriate, innovative funding mechanisms such as trust funds, debt-for-conservation, etc. (see also suggestions from some states, Box 7.1.9.2). Citizens' groups to take special measures for this, independently of or in collaboration with government agencies. Learn from lessons of the few such existing innovations, such as the Trust Fund for the Gulf of Mannar (see Section 6.1.9.2), the Kani Trust Fund (see Boxes 6.48 and 6.67), and others within and outside India.

Box 7.1.9.2 Innovative Financial Mechanisms at State Level

(Recommendations in some state BSAPs)

Arunachal Pradesh: Budgetary Provisions in Departments

- Provisions in all the line departments of the government, in their annual operating plans (AOPs) and budget, with at least 5% of the total budget allocated for biodiversity conservation and promotion concerns.
- Coordination of inter-departmental/inter-sectoral activities with adequate investment in all the line departments of the government to conserve biodiversity and environmental concerns.

Punjab: Economic Instruments for Biodiversity

- Separate budget head on biodiversity by state departments of Planning and Finance.
- About 1% of existing budgets of various departments, related to or having an impact upon biodiversity, diverted to this head for specific conservation projects.
- Scheme for providing financial incentives to farmers following traditional farming practices, communities actively conserving specific areas/species and landowners promoting habitat conservation on private lands.
- Extension of crop insurance policy to traditional crops.
- Introduction of Crop Insurance & Compensation Scheme for farmers suffering from crop damage by wild animals.

West Bengal: Corporate Biodiversity Fund

A Biodiversity Conservation Fund be created as a corpus by industries and organisations benefitting from biodiversity products, e.g. tea, jute, pharmaceuticals, fisheries, tobacco, oil, natural gas, aquaculture etc. These industries should contribute a portion of their annual profit to build this Fund, setting aside funds for biodiversity-related initiatives at various levels, particularly for biomass alternatives, fuel-efficient devices, research/monitoring programmes, etc.

6. Encourage bBanks and Banking Institutions to Generate Funds for Biodiversity

Take steps to encourage and orient banks and banking institutions (including major public sector ones like NABARD) to generate funds for biodiversity, and to direct their loan schemes towards biodiversity-friendly activities.

Justification: Banks and banking institutions are today the repositories of considerable financial resources. Neither their public support activities, nor their current loan policies, are, however, oriented towards biodiversity. If this is done, they could be a substantial source of financial resources for conservation, sustainable use, and biodiversity-based livelihood generation.

Suggested Responsibility: The Reserve Bank of India along with the Ministries of Finance, Commerce, Economic Affairs, Rural Development, and Environment and Forests to make guidelines for the above; banks and banking institutions, and their associations to implement.

Time Frame: 2 years for the guidelines; 10 years for all banks to show results.

Steps:

- i. RBI and Ministry of Finance to set up a working group, consisting of relevant officials and independent banking/environment/biodiversity experts, to make the guidelines;
- ii. A circular or notification to be issued by the central government to all banks and banking institutions (public and private), to abide by the guidelines;
- iii. The above working group to monitor the implementation of the guidelines in a publicly transparent manner, and to provide a public report on the progress every two years.

7. Encourage Insurance Companies to Provide Cover to Biodiversity-Friendly Livelihood Activities

Take steps to encourage and orient insurance companies (including major public sector ones like LIC) to institute schemes for providing insurance against disasters and destruction of biologically diverse livelihoods, including in forestry, fisheries, agriculture, pastoralism and artisanship. This should include insurance against crop and livestock damage by wildlife.

Justification: Insurance companies have so far ignored, or been reluctant to cover, environment and biodiversity-related activities. They need to consider such coverage as both a responsibility and good economic sense, for which other institutions (both governmental and NGO) need to orient and support them.

Suggested Responsibility: Key insurance companies in the public and private sector, with guidance and support from MoEF, environment-related institutions and NGOs.

Time Frame: Ongoing

Steps:

- i. LIC and other major insurance companies to set up a working group (including experts in ecological economics) to consider a range of measures, and to circulate guidelines and suggestions to all companies;
- ii. RBI or other relevant government institution to consider financial support for an initial period, to insurance companies trying out innovative measures.



Ongoing Relevant GOI Schemes/Programmes:

- (i) Investment Promotional Schemes (ii) Technology Development Extension and Training under Other Schemes of Wasteland Development, of the Ministry of Rural Development

8. Encourage the Corporate Sector to Generate Funds for Biodiversity

Take steps to encourage the corporate and business sector to provide funds for biodiversity, and to redirect/re-orient their current financial practices towards being more biodiversity-friendly. Such provision of funds should be without any conditions attached, and should not become merely a 'greenwash' to disguise essentially destructive activities.

Justification: The corporate and industrial sector in India control very substantial financial resources, and also have significant (mostly negative) impact on biodiversity. Yet they are doing very little to re-orient their own financial practices to make them ecologically sensitive, or to fund biodiversity-related activities. Many corporations that do fund environmental activities use this as a convenient shield to hide practices that continue to be ecologically destructive. Basic changes are therefore required in the behaviour of this sector.

Suggested Responsibility: Industry and corporate associations, such as CII, FICCI, ASSOCHAM etc., with the lead being taken by corporate houses that have shown responsible behaviour vis-à-vis the environment; with guidance/monitoring from MoEF, relevant institutions, NGOs and people's movements/networks.

Time Frame: Ongoing

Steps:

- i. MoEF to call for consultations with industry and corporate associations, to work out possible ways and means of generating public service funds, while ensuring that such funds are not tied up to the commercial interests of member corporations; alternatively, these associations can take the initiative themselves and seek guidance from MoEF and relevant NGOs;
- ii. A code of ethics and conduct to be formulated by environmental agencies in consultation with these associations, for the generation, use, and monitoring of the funds.

9. Encourage Public Charities, Foundations and Religious Institutions to Generate Funds for Biodiversity

Take steps to encourage public charities, foundations, and religious institutions to generate funds for biodiversity, and reorient their existing funding activities towards being more biodiversity-friendly. Encourage and pressurise religious institutions to revive or adopt conservation and sustainability practices within pilgrimages, paying back for the services provided by natural ecosystems in which they take place. Ensure that such activities in no way take on a communal or fundamentalist orientation.

Justification: Public charities, foundations and religious institutions control substantial funding resources. They also use or have influence in ecologically sensitive areas, or deal with issues relating to wildlife, and could therefore play a major role in funding conservation and sustainable use. Such an orientation is today largely missing.

Suggested Responsibility: Ministry of Tourism and Culture, Commissioner of Charities and apex bodies of religious institutions, with guidance from environmental agencies and NGOs.

Time Frame: Ongoing

Steps:

- i. MoEF or agency designated by MoEF to prepare a comprehensive list of charities, foundations, religious institutions, etc., who could be encouraged or approached for fund purposes;
- ii. Such agency to call for consultation(s) with the listed bodies, regarding ways and means of generating, using and monitoring the funds.
- iii. Such institutions as are already funding biodiversity conservation activities to provide information on their activities; NGOs to document successful efforts;
- iv. Special efforts to be made regarding the channelisation of funds raised by religious/pilgrimage bodies, foundations, and other institutions managing pilgrimage sites in natural areas;
- v. All initiatives to maintain full transparency, and to ensure that there is no element of a communal or fundamentalist nature.

10. Encourage NGOs, Academic Institutions and Citizens' Organisations to Generate Funds for Biodiversity

Take steps to encourage non-governmental organisations, citizens' groups, academic institutions and other such agencies to generate funds for biodiversity and to re-orient their existing funding activities towards being more biodiversity-friendly.

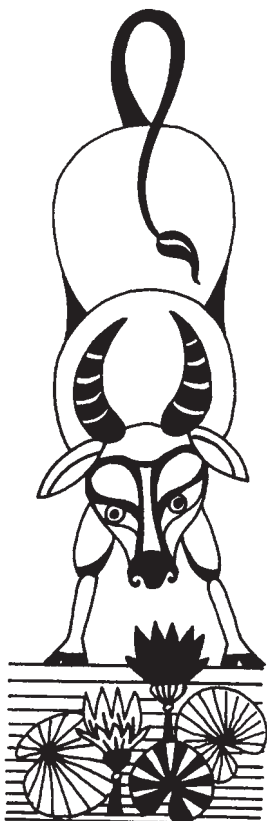
Justification: With growing citizens' faith in civil society organisations such as NGOs, there are greater possibilities for this sector to generate funds. Such a potential needs to be fully tapped.

Suggested Responsibility: NGO networks and forums, with help from MoEF and state-level environment agencies.

Time Frame: Ongoing

Steps:

- i. MoEF to commission an appropriate research organisation to list and document ongoing NGO/civil socie-



- ty/academic institution efforts at raising funds for biodiversity conservation;
- ii. NGO networks and forums to expand their efforts at raising funds for biodiversity, including for the work being done by official agencies and communities at sites important for biodiversity;
- iii. Monitoring of the funds to be done from within citizens' groups themselves, involving community institutions, with full transparency.



11. Mobilise External Funding on Indigenous Terms

Mobilise funds from external multilateral and bilateral aid agencies, both governmental and private. Ensure that these are taken on terms that are appropriate to the Indian situation, and are not tied up to unacceptable conditions such as high interest rates, external access to Indian genetic/biological material without safeguards, and so on. Ensure also that such external funding is only additional to what can be raised within India, and that it does not become an excuse for Indian governments or other sources not to commit adequate financial outlays.

Justification: Considerable external funding is available, and could be availed of with good effect, especially as seed or catalyst money for biodiversity-related projects. Quite a bit of project funding is already coming from outside for biodiversity-related activities. However, such funding is often tied up to conditionalities that are detrimental to the long-term interests of the country and/or communities concerned. India is in a sound enough financial position not to have to take money on such conditions.

Suggested Responsibility: MoEF, MoA, and other relevant ministries along with Ministry of External Affairs, and Ministry of Finance, NGOs, community networks, and institutions, independently as also in association with government agencies.

Time Frame: Ongoing

Steps:

- i. Showcase the very many innovative initiatives on biodiversity that are ongoing in India, and make a case for additional external funding;
- ii. Explore funding possibilities from sources that are often not tapped, including foundations, charities and fund mechanisms from the various international conventions (including desertification, biodiversity, climate);
- iii. Maximise the possibility of funding from progressive countries, such as those from Scandinavia;
- iv. Maximise the possibility of funds from sources like GEF, while ensuring that agencies like the World Bank are not allowed to dominate.

12. Set Up Dedicated Biodiversity Funds at Local, State, and National Levels

Create, or strengthen existing, funds at local, state, and national levels, which can receive the resources generated by the various actions proposed in this plan. These funds to be dedicated to the conservation of biodiversity, sustainable use of resources, and achievement of equity in such actions. This should consolidate funds created or suggested under the Plant Varieties and Farmers Rights Protection Act and the Biological Diversity Act. A part of these funds (or an independent fund) could be set aside for only women to access.

Justification: Given that funds dedicated to biodiversity at the central and state levels are likely to remain inadequate (even if the above-mentioned actions are taken) and often get mixed up with other environmental issues, there is a need to create separate, targeted funds for biodiversity at various levels of governance.

Suggested Responsibility: Relevant governance institution at each level (*see Section 7.0.2*), with guidance from the institutions to be set up at local, state, and national levels under the Biological Diversity Act (*see Chapter 8*).

Time Frame: 3 years

Steps:

- i. Identify existing or proposed funds, such as those to be set up under the above-mentioned Acts, that can

- play the role envisaged above;
- ii. Where these do not exist or are not proposed, consider establishing such funds;
- iii. In all such cases, set up fund management committees that are multi-stakeholder, in particular involving representatives of local biodiversity-dependent communities, and that are fully transparent to the public;
- iv. Channelise money from the sources given in actions above into these funds;
- v. Where possible, set up an independent channel for women to access the funds;
- vi. Establish a clear, transparent process of fund allocation, disbursement and monitoring.

7.1.10 Wild Biodiversity: Strategies and Actions Related to Technology

Overall Strategies: 'To encourage research, development and adoption of environmentally compatible technologies, and to promote application of the modern tools of science and technology for conservation, bridging of large gaps in supply and demand as well as control and monitoring of natural resources' (National Conservation Strategy, GOI).

1. **Introduce materials-efficiency, energy-efficiency, waste-reduction, and recycling** in all existing technologies that use biological resources or have an impact on biodiversity;
2. **Enhance R&D on and dissemination of alternative technologies and materials**, that are ecologically and socially more appropriate and sustainable; this includes traditional and modern technologies, whose mutual complementarity should be increased; in this, ensure that locally developed and/or appropriate technologies are given strong preference and support;
3. **Introduce new conservation technologies, and enhance the use of existing ones**, for reducing/eliminating wildlife damage in resource use operations such as fisheries, for controlling ecologically destructive phenomena like fire, disease, pollution, and alien invasives; for *ex situ* conservation; for information generation and storage; for species rehabilitation; etc.;
4. **Ensure community understanding and control of introduced technologies.**

7.1.10.1 Strategy: Make Existing Technologies Biodiversity-Friendly, and Introduce New Eco-Sensitive Technologies

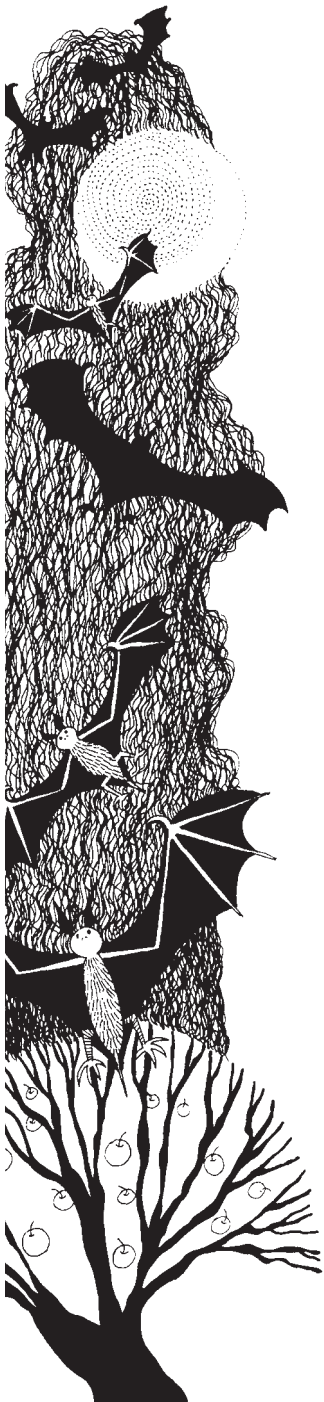
Actions

1. Introduce/Enhance Materials Efficiency in All Existing Technologies, Especially to Promote Sustainability of Resource Use

Introduce (or where already existing enhance) the efficiency of use of materials, in all technological processes that use natural (including biological) resources. This includes, among others, technologies using wood products, non-wood forest produce including medicinal and aromatic plants, aquatic produce, water, minerals and other natural products. The technologies could be in industrial, agricultural, infrastructural, or household use, such as the use of wood for fuel in all these sectors. Efficient technologies that already exist should be spread widely, based on their ecological and social appropriateness in each local area.

Justification: Many technological uses of biological and other natural resources in India, both in the traditional and modern sectors, consume energy and materials in a wasteful manner. This has a direct or indirect impact on biodiversity, through the over-exploitation of plants and animals, over-use of water (with an indirect impact on wetlands and related ecosystems), loss of habitat, etc. There is therefore a need for major technological and attitudinal changes in materials use.

Suggested Responsibility: Ministry of S&T, MoEF and other relevant ministries, through relevant technology institutes, including IITs, that have specialised departments on this subject, CAPART, Petroleum Conservation Research Association, organisations working on appropriate technology such as ASTRA/IISc, CART, and Centre for Science for Villages, National Institute of Rural Industrialisation, PPST, People's Science or Jan Vigyan networks, Forum of Scientists, Engineers, and Technologists (FOSET), NIF, industry associations like CII, ASSOCHAM, and



FICCI, individual private enterprises, etc.

Time Frame: 3 years for production and dissemination of sourcebooks of existing materials-efficient technologies; ongoing for introduction of further efficiency.

Steps:

(see also actions in *Strategies 7.1.4.1 to 7.1.4.4*, including *Box 7.1.4.2* on medicinal plants; see also *Box 7.1.7.3* on thermal power, and *Box 7.1.10.1* on paper mills)

- i. Put together sourcebooks or directories of existing materials-efficient technologies and their producers, with several language editions to make them accessible to communities throughout India; build on existing information and databases available with organisations such as those mentioned above;
- ii. Explore globally for such technologies, and use relevant bilateral and multilateral channels, including the relevant provisions of the CBD, to bring in the ones that are shown to be ecologically and socially appropriate;
- iii. Enhance R&D of materials-efficient technologies, through participatory mechanisms with the intended target groups; use for this the lessons learnt in the work of the above-mentioned organisations, especially on how to ensure that technologies are ecologically and socially appropriate;
- iv. Use available networks and institutional mechanisms (especially those with a mass base like the *jan vigyan* or people's science movements, and the public sector ones like *vigyan kendras* or science centres), to popularise existing and new technologies that are materials-efficient;
- v. Use a mix of economic disincentives and incentives to induce a move away from wasteful and destructive technologies to materials-efficient ones;
- vi. Award outstanding innovations in such technologies, building on the work of processes such as NIF.

2. Reduce and Where Possible Eliminate Pollution from Existing Technologies

Reduce, and where possible eliminate, water, air, noise, soil, and radiation pollution from existing technologies. Build on available pollution-reduction technologies, enhance their use, and conduct R&D into new ones for a range of pollution situations.

(For detailed examples, see those of paper mills in *Box 7.1.10.1* and thermal power in *Box 7.1.7.3*).

3. Identify and enhance the use of alternative raw materials, especially in cases where the materials are currently coming from natural ecosystems

Substitute, as far as possible and appropriate, biological resources being used in bulk in industrial, agricultural, and household technologies, with ecologically more sensitive materials. In particular, find alternatives for the large-scale use of wood in the paper, furniture, housing, and other sectors, such as the use of agricultural residues to produce substitute furniture/building materials like *Ecoboard*, or the use of treated bamboo for construction and road-building (see also *Box 7.1.10.1*). In all such cases, carry out impact assessment to ensure that the replacement materials are not ecologically or socially more destructive (even if indirectly so, as in the case of many plastic-based technologies and products that are claimed to be eco-friendly alternatives to wood).

Justification: Many current industrial, household, and agricultural uses of biological resources are unsustainable, and are leading to biodiversity loss. This is especially true of the wasteful consumerism in urban as well as, increasingly, rural areas. Technological and social alternatives do exist for these resources, but are not yet in widespread use.

Suggested Responsibility: As in Action 1 above

Steps: As in Action 1 above, with appropriate modifications

Box 7.1.10.1 Making Paper Production Biodiversity-friendly

Justification: India's paper mills are severely destructive of biodiversity, through their dependence on harvesting forest resources, air and water pollution, and siting in natural ecosystems. They also often cause serious dislocation of local community livelihoods. Major changes are therefore needed in the technological and other aspects of paper production.



Suggested Responsibility: Paper industry sector, with guidance and support from Ministry of Industries, MoEF, state pollution control boards, and relevant technology design institutes.

Steps:

1. Source tree-based raw materials from areas other than natural forests, including through arrangements with farmers (taking care not to divert critical food-growing lands) or community-based plantations on degraded (non-pasture) lands;
2. Encourage R&D within the paper industry, to develop alternative raw materials and alternative sources, and to develop resource-efficient technologies;
3. Move towards existing and new units being based predominantly on non-forest based raw materials, including waste paper and cloth, and agro-based resources such as rice straw, wheat straw, gunny or jute cuttings, bagasse, grasses etc.; facilitate further use of such materials by the small paper mills across the country that are already using it to some extent; encourage NGOs and the private sector develop this further; develop low cost technology for effective utilization of such raw materials;
4. Support local cultivation of raw materials such as silk cotton, banana fibre, straws and grasses that form part of the blending process in the manufacture of paper;
5. Periodically analyse the effluents from paper mills, and install pollution control and waste recycling technologies in all mills; eventually move towards a zero-pollution and no-waste production process; meanwhile, bring in ecological monitoring of land and water around the mill to ensure that impacts are actually reducing when introducing new technologies;
6. Set up ancillary industries for using solid wastes generated by the mills;
7. Experiment with safe biotechnologies that can help in processes such as digestion, e.g. for the recovery of alpha cellulose from different non-forest based materials, and for lignin removal using organisms like white-rot fungi, thereby eliminating the use of chemicals and associated effluent disposal problems;
8. Develop alternative technology that seeks to integrate methods for rapid human resources skill development as a means of internal quality control
9. Encourage the widespread use of unbleached recycled paper produced in a non-polluting manner.

Source: Paper Mills and Biodiversity Sub-thematic Review; NIRD Project Report 2001

4. Promote a range of non-conventional and alternative energy sources

Promote the much greater development and use of non-conventional and alternative energy sources and production processes, which are proven to be biodiversity-friendly or less destructive than conventional sources. This should include solar, micro-hydel, tidal, wind, and biomass-based energy, ensuring their ecological sustainability and socio-cultural appropriateness. Such technology promotion should focus especially on ecologically sensitive areas, where appropriate incentives may be offered on a priority basis (e.g. in forest villages).

India has a huge potential for tapping renewable energy. However, only a small fraction of this potential has so far been tapped (*see Table 7.3*).

	Estimated Capacity	Installed Capacity
Wind energy (MW)	45,000	1,500
Biogas (nos.)	12,000,000	3,130,000
Biomass gasifiers (MW)	19,500	400
Minihydel (MW)	10,000	210
Solar Photo-voltaics	20 MW/sq km	60 MW ^a
Solar water heaters (nos.)	30,000,000	500,000
Ocean (MW)	50,000	nil
Bagasse-based co-generation (MW)	NA	3,500

(Source: Thermal Power and Biodiversity Sub-thematic Review)

Finally, hydrogen is projected as the fuel of the future – clean and abundant. The government should state its position in a policy paper on energy and environment on how the transition from a carbon-based energy system to a hydrogen-based energy system will be made, and take steps to move in that direction.

Justification: Conventional energy sources can be rather destructive of biodiversity, through enormous use of raw materials, pollution, and siting problems. There now exist an array of alternative sources, which India needs to tap much more vigorously. Renewables form only 3% of the installed power generation capacity in India today. This needs to be considerably enhanced, while ensuring that their environmental impacts are also minimised.

Suggested Responsibility: Ministry of Non-Conventional Energy Sources and related state departments, NGOs like the ones mentioned above, and other experts.

Time Frame: Ongoing; with a target that at least a fourth of India's energy generation will move into alternatives by 2020.

Steps:

Build on existing work by the Ministry of Non-Conventional Energy Sources and other related agencies at the state level, and by institutions and NGOs like ASTRA/IISc, Prayas and International Energy Initiative.

5. Promote Alternative and Localised Technologies in Construction

'Promoting the use of indigenous building materials and appropriate construction technologies by revising building and planning codes supporting small scale production, skill upgradation of artisans and people oriented delivery systems' (National Conservation Strategy, GOI).

Promote the use of alternative construction technologies, which optimise environmental conditions, substantially reduce natural resource (especially mineral) extraction, minimise the long-distance transport of materials, maximise the use of local expertise and skills, and reduce dependence on outside 'experts'. This should especially include a range of construction methods that utilise mud and mud-based materials, which are proven to be long-lasting, safe, and durable, and which cause less ecological damage than the cement-brick kind of conventional construction materials.

Justification: The increasing 'homogenisation' of construction technologies all over the country has led to a rapid erosion of traditional housing techniques, and the spread of the cement-brick model. This model is extremely destructive, as it relies on extensive mining, highly polluting production processes, and long-range transportation of this material. A major national thrust towards more localised, alternative sources is needed.

Suggested Responsibility: Ministry of Rural Development and Ministry of Urban Affairs, through institutes working on construction technology, IITs, National Institute of Rural Industrialisation, NGOs like Development Alternatives, alternative architecture experts, etc.

Time Frame: Ongoing

Steps:

- i. Conduct a nation-wide inventory of traditional and innovative new construction techniques that conform to the above requirements;
- ii. Encourage the development of manuals propagating such techniques for use by architects, home-builders, and urban/rural planners;
- iii. Bring in legislative and administrative measures, including appropriate guidelines, to phase out destructive construction technologies and bring in ecologically friendly ones; start especially with ecologically sensitive areas where haphazard and rapid construction is a major threat;
- iv. Provide a range of incentives for the above.



6. Promote Alternative, Decentralised Water Harvesting Systems in Villages and Cities

Promote the use of alternative, decentralised water harvesting systems in all settlements, including a mix of sources and strategies. Set realistic and effective targets for the provision of appropriate amounts of water to each village and city. A big thrust should be on roof-top water harvesting in each settlement, with the ultimate aim of making each of them relatively self-sufficient, rather than more and more dependent on water sources from long distances.

Justification: Many current technologies for water harvesting (such as big dams) continue to cause serious biodiversity damage in production and transmission. On the other hand, both government and NGO programmes across the country have shown the potential of decentralised, community-managed water harvesting techniques. This potential should be further used.

Suggested Responsibility: Local community institutions such as water use associations (acting within *gram sabha* authority), and urban residents' associations; guided by the Jal Biradari and other people's networks, and facilitated by the Ministry of Water Resources and its counterpart departments at state level, including urban authorities.

Time Frame: Municipal orders within a year, implementation ongoing thereafter; ongoing in rural areas.

Steps:

- i. All urban municipalities to issue an order requiring roof-top water harvesting in all new constructions (as has been done in the case of Delhi, Bangalore, Chennai and other cities), and to promote schemes to help subsidise this as well as conversion of existing buildings to maximise such harvesting;
- ii. Urban authorities to also maximise the recovery and recycling of wastewater, to minimise use of freshwater supplies;
- iii. Provide support to village institutions, including PRIs, to carry out water harvesting schemes, building as far as possible on locally available material and skills, and ensuring that the resulting structures and waterbodies are under the control of the *gram sabha* or equivalent village council; this should include reviving disused traditional structures and systems of water harvesting.

7. Promote BioDiversity-Friendly Alternative Products, Recycling, and Waste Reduction

Promote, through awareness and incentives, a range of alternative products, recycling, and waste reduction, e.g. in the following fields:

- i. **Source Reduction (Waste Prevention):** Source reduction can be a successful method of reducing waste generation. Practices such as backyard composting, two-sided copying of paper and transport packaging reduction by industry have yielded substantial benefits through source reduction. Source reduction has many environmental benefits. It prevents emissions of many greenhouse gases, reduces pollutants, saves energy, conserves resources, and reduces the need for new landfills and combustors.
- ii. **Product reuse:** Products should be designed such that they may be reused. Returnable soft-drink bottles are an example. This ensures an extended material life, thereby reducing the volume of the waste generated.
- iii. **Recycling:** While talking about waste management, it is important to mention recycling activities. Recycling in India is a highly organised and profit-making venture, though it is informal in nature. The modus operandi involves several middlemen who gather the recyclables from various sources, after which they ultimately reach shanty backyards/houses behind which these recycling units operate discreetly. It is estimated that about 40%-80% of plastic waste gets recycled in our country, as compared to 10%-15% in the developed nations of the world. However, due to lack of any government policy, incentives, subsidies, regulations, and standards related to recycling, this particular industry is still far behind its western counterparts in terms of technology and quality of manufactured goods.

Cities in India are faced with the growing problem of urban solid waste. Traditional methods of waste disposal, under the purview of municipal and civic bodies have largely limited themselves to 'collect and dispose' functions, which are becoming inadequate to cope with the increasing quantity of waste and its changing nature. Rising per capita incomes have led to changing consumption and waste generation patterns. There are a number of new materials being introduced into the waste stream, which are merely dumped since there is little else that can be done to them (e.g. batteries).



There are, however, a variety of communities involved with the business of waste, whose contribution remains unrecognised. There is the unacknowledged sector of waste pickers and recyclers, which handles over 10-15% of the total waste stream. This informal sector has been traditionally involved in the process of recycling some of these materials, such as plastics, metals and paper. It is characterized by an underpaid and people-led collection system, with poor and rudimentary technology for processing, involving a high degree of occupational and environmental hazards. The resultant recycled products are mostly of poor quality and low cost, incapable of finding markets occupied by virgin material-based products. As a result, both the people involved in the trade as well as the products from recycled waste are largely neglected. On the other hand, developed countries have adopted centralized and highly technology-intensive approaches. These function within an economic paradigm where the large part of the cost is borne by the waste generator. Various disposal alternatives are possible within this paradigm, ranging from incineration to recycling and landfilling, their mix depending on the degree of internalization of the costs the fiscal system permits. Such models may not be cost effective for countries like India, especially owing to the presence of the informal sector, as well as a lack of a comprehensive system of fiscal instruments which could be used to regulate the generation and disposal of waste.

Also, in the emerging waste policies in India, though recycling has been accepted as a key option for urban solid waste, there has been almost no move towards any interventions. Hence there is a large gap in policy, which urgently needs to be filled. It should be possible to adopt alternate approaches and models for a country like India.

- iv. Product alternatives: Conceive and produce alternative products, including agricultural residue-based boards, e.g. boards made from bagasse that can replace most wood-based products (such as *Ecoboard*), or oil from seeds (e.g. *Honge (Pongamia pinnata)*) as a petroleum substitute (<http://sutra.iisc.ernet.in>).

Suggested Responsibility: Ministry of Science and Technology, Ministry of Environment and Forests, urban municipalities and district authorities.

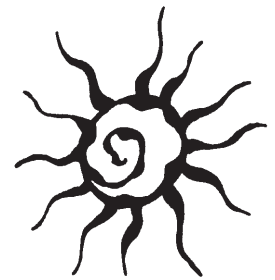
7.1.10.2 Strategy: Introduce New Conservation Technologies, and Enhance the Use of Available Ones

Advance the use of existing conservation technologies that are ecologically and socially appropriate, and intensify R&D into traditional or new technologies in key gap areas. In particular, such development is needed in the fields of:

- i. Control of ecologically destructive phenomena such as fire, disease, alien invasives and pollution;
- ii. Control of inadvertent wildlife damage, e.g. through use of turtle excluder devices (TEDs) and dolphin-friendly technologies for fisheries;
- iii. *Ex situ* conservation or propagation of plants, animals, and micro-organisms, for their own survival; reintroduction and reduction in exploitation of the same species *in situ*;
- iv. Genetic fingerprinting, digital and electronic recording and storage, and other technologies that can help detect biopiracy and invasive aliens, as also help in conservation, storage, and research;
- v. Rehabilitation techniques for species whose populations have to be relocated; e.g. tree transplantation technologies;
- vi. Other long-term storage of genetic material;
- vii. Radio telemetry and other technologies for wildlife tracking and research;
- viii. Other such technologies.

Justification: Significant advances are now available in the field of detection and conservation technologies; these, in conjunction with relevant traditional technologies, could be a key tool towards biodiversity conservation and sustainable use.

Suggested Responsibility: Ministry of Science and Technology, MoEF, DBT, and relevant public/private sector institutes conducting R&D on these lines, with the involvement of WII, IIFM, various state forestry research institutes, as well as relevant NGOs and groups like the ones mentioned above.



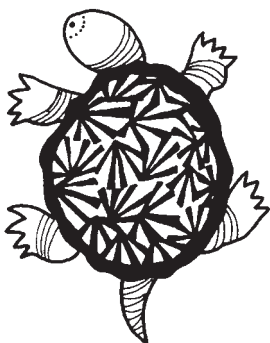
Steps:

- i. Ministry of Science and Technology and MoEF to set up a standing team of wildlife researchers and S&T experts, to regularly identify existing technologies within and outside India that would be appropriate for Indian conditions; this should include traditional technologies as well;
- ii. Propagate and popularise appropriate technologies amongst relevant users, e.g. TEDs amongst fisherfolk; where necessary, provide subsidies and incentives for their widespread use;
- iii. Appropriate allocations to be made, and additional funding to be sought, for the purchase and use of these technologies.

7.1.10.3 Strategy: Promote Traditional Biotechnologies and Ensure that New Biotechnologies are Safe

(see also 7.2.10.2)

1. Document, assess and promote the use of traditional biotechnologies, including for fermentation, storage and other uses, and promote their use through appropriate social and financial incentives;
2. Build, into the existing law and procedures, mandatory long-term tests for all existing and upcoming modern biotechnological products/processes, to determine their impacts on natural ecosystems and wild plants/animals;
3. Build, into existing law and procedures, the supremacy of the precautionary principle in cases where it cannot be established beyond any reasonable doubt that the products/processes are safe from biodiversity perspective
4. Involve concerned NGOs and farmer groups in all decisions relating to such products/processes, in particular decisions relating to GE/GM products and foods, and including in all screening and clearance procedures such as those of the Genetic Engineering Approval Committee (GEAC);
5. Strengthen the infrastructure, training, and humanpower for detection of illegal introduction and use of GE/GM products/processes, and for monitoring the impacts of any biotechnology products/processes that are cleared;
6. Build, into existing laws and procedures, impact assessments on human and livestock health, on livelihoods, and on aspects such as equity; in particular, build in measures to ensure that biotechnology products/processes do not increase inequities or cause further loss to already underprivileged sections of society;
7. Promote the use of microbial technologies to make safe medicines and other products; focus especially on micro-organisms from extreme environments;
8. Ensure total transparency in the assessments of risks from new technologies to biodiversity.



Suggested Responsibility: Department of Biotechnology, GEAC, relevant state government departments, in collaboration with universities and expert institutions.

7.1.11 Wild Biodiversity: Strategies and Actions at International Forums

Overall Strategies:

1. **Advocate stronger biodiversity integration into all environment-related agreements and forums**, including United Nations Forum on Forests, Framework Convention on Climate Change and its protocols, Persistent Organic Pollutants treaty, and the Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal;
2. **Advocate biodiversity integration into non-environment related agreements and forums**, including the International Tropical Timber Organisation and those within the World Trade Organisation;
3. **Encourage joint use of international human rights and environmental instruments to further biodiversity and related livelihood concerns**; the former would include the UN Declaration on Human Rights, relevant Conventions of the International Labour Organisation, draft declarations of indigenous peoples, etc.;
4. **Facilitate and enhance civil society networking on international issues and agreements**, including through initiatives such as the World Social Forum.

7.1.11.1 Strategy: India to Advocate Strengthening of Biodiversity Integration into all Environment-Related Agreements

Actions

1. United Nations Forum on Forests (UNFF)

- i. India to continue taking a stand that all forest biodiversity matters should remain under the Convention on Biological Diversity, and that there should be no separate international legal regime on forests;
- ii. India to strongly advocate a definition of forests that is focused around natural, mixed forests, and to keep monocultural plantations out of this definition.

Justification: Currently, the FAO classifies any kind of land with a certain amount of tree cover as 'forests', including monoculture tree plantations, orchards and gardens. Even 'temporarily unstocked' (i.e. clear-cut) areas are still classified as 'forest', provided there is an 'expectation' that there will be trees on that piece of land again in the near or even distant future. An FAO and CIFOR expert group meeting in January 2001 has concluded that the plantation-friendly definition of forests used by the FAO was adequate and should be used as the basis for 'harmonizing' other forest definitions. For this definition to become widely accepted could be very detrimental to the conservation of forest biological diversity. One of the possible outcomes, for instance, is that resources meant for forest conservation could flow to plantations that have serious social, equity and biological impacts.

Suggested Responsibility: MoEF, with inputs from NGOs, institutions, and community networks working on this subject, including Asia Forestry Network, All-India Coordinating Forum of Adivasi/Indigenous Peoples, and others.

2. Framework Convention on Climate Change (and Subsequent Protocols)

India to lobby for a definition of 'carbon sinks' that is biodiversity-sensitive and takes into consideration the critical livelihood dependence of forest-dwelling communities. This would include the point made above (about not accepting the FAO definition of 'forests') and explicitly excluding monocultural plantations as a means of carbon sequestration or in the Clean Development Mechanism. The forum of the ad hoc technical group set up under the CBD, to look at the interface between climate change and biodiversity, could be another forum for influencing the outcome in the UNFCCC.

Justification: (partly as in *Action 1*); it should be noted that under UNFCCC, with the FAO definition, plantation companies would be allowed to reap profits merely from classifying their large-scale industrial tree plantations as carbon sinks.

Suggested Responsibility: MoEF, Ministry of Industries and other relevant ministries, with inputs from NGOs, institutions, and community networks working in this field.

3. Persistent Organic Pollutants Treaty

- i. India to ratify the treaty;
- ii. India to pro-actively ask for phasing out of all POPs, and review its own domestic policies and programmes regarding many of them, including dieldrin, DDT, and incineration technologies.

Justification: Several governments have taken action to phase out and ban POPs, recognising the serious ecological and human health damage that these substances cause. India should also join this progressive group of countries, and indeed take a leadership role in getting rid of dangerous substances/chemicals, as also in promoting safer alternatives that are already available.

Suggested Responsibility: MoEF and Ministry of Chemicals and Fertilisers, with inputs from relevant NGOs and institutions (like Toxics Link) working in this field.



4. Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (Basel Convention)

- i. India to ratify the Convention Amendment (the Basel Ban), completely banning the export of toxic wastes from developed to developing countries, and to review its domestic policies and programmes of allowing import of such wastes for recycling purposes;
- ii. India to seek inclusion of more hazardous substances onto the Basel lists, rather than attempt to remove items such as PVCs.

Justification: All wastes that are known to be hazardous would have significant impact on biodiversity (and on human/livestock/environmental health), and there appears to be no justification for allowing their continued export and import.

Suggested Responsibility: MoEF and Ministry of Chemicals and Fertilisers, with inputs from relevant NGOs and networks like Toxics Link.

7.1.11.2 Strategy: India to Advocate Biodiversity Integration into Non-Environment Related Agreements

1. International Tropical Timber Organisation (ITTO)

- i. India to push for central integration of biodiversity into all the activities under ITTO, including its sustainable forestry objectives;
- ii. India to advocate far greater participation of forest-dwelling communities in the negotiations.

Justification: The ITTO's primary focus is on timber trade, and this tends to often override considerations of both forest biodiversity conservation and the livelihoods of those dependent on forests; moreover, the negotiations themselves are not as open and participatory as in other forums, e.g. Convention on Biological Diversity.

Suggested Responsibility: MoEF

2. World Trade Organisation Treaties

(see Section 7.2.11)

7.1.11.3 Strategy: Enhance Civil Society Networking and Participation Relating to International Issues and Agreements

Facilitate and enhance networking and joint actions by civil society organisations at international forums, such as the World Social Forum and NGO forums at the meetings of major international agreements. Such networking would be by civil society groups, but the Government of India could facilitate the process by actively soliciting relevant information (e.g. relating to economic/trade negotiations, GMOs and other biotechnology developments, IPRs, etc.) from international forums and other countries, and disseminating these to the civil society groups, calling for consultations with such groups before every key meeting of international instruments, and providing funding support for participation.

Justification: Networking of civil society organisations across the world has had a significant impact on the nature and course of international deliberations and negotiations on environmental, economic and social issues. Such networking and joint actions are increasing, in no small measure due to Indian participation. This participation needs to be enhanced, especially by facilitating participation by communities themselves rather than by others representing them.

Suggested Responsibility: Environmental and social action groups, and their networks like National Alliance of People's Movements and the Indian coordinating team of the World Social Forum, with facilitation by relevant Government of India ministries.



Steps:

- i. NGOs and other civil society organisations in India to expand their networking with similar groups in other countries, for mutual learning and collective actions;
- ii. Relevant ministries to mandatorily conduct consultative meetings well in advance of meetings of international treaties, with provision of all relevant information/documents;
- iii. NGOs and government agencies to facilitate the full and meaningful participation of communities in this process.

7.1.11.4 Strategy: Encourage Joint Use of International Human Rights and Environmental Instruments to Further Environment/Biodiversity and Livelihoods Concerns

Enhance the use of international human rights (HR) and social welfare instruments, along with environmental instruments like those mentioned above, to secure the environment/biodiversity and livelihood rights of Indian people. Such HR instruments include the Universal Declaration of Human Rights, the International Covenant on Economic, Social and Cultural Rights, the International Covenant on Civil and Political Rights, the Convention on the Rights of the Child, the International Convention on the Elimination of All Forms of Racial Discrimination, the Convention on the Elimination of All Forms of Discrimination against Women, various Conventions of the International Labour Organisation, various UN forums on human rights (such as the UN Commission on Human Rights, treaty bodies like UN Committee on Economic, Social and Cultural Rights, and mechanisms such as the Special Rapporteurs on the adverse effects of the illicit movement and dumping of toxic and dangerous products and wastes, Right to Food, Right to Housing and the Rights of Indigenous Peoples), the Draft Declaration on indigenous peoples, forums on child and women's rights, etc. Infuse these instruments and forums with biodiversity perspectives, where such perspectives are weak, while also bringing human rights perspectives into environmental instruments, where they are weak on this front.

Justification: There is very little cross-fertilisation amongst the international human rights and environment/biodiversity agreements and forums, and not enough use of such forums by India to further its biodiversity and livelihood concerns. There are potentially powerful uses for HR and social welfare instruments and forums, including to resist the ecologically destructive forces brought in by other international processes such as those related to WTO and globalisation.

Suggested Responsibility: National Commission of Human Rights and MoEF, with other relevant ministries, including Ministry of Commerce, official agencies representing India at UN forums, and NGOs, community networks, and institutions working on these issues; this should include national HR networks like People's Union for Civil Liberties, People's Union for Democratic Rights, National Alliance of People's Movements, HR documentation and advocacy groups, groups that are part of international networks working on child rights, women's rights, housing rights (e.g. Habitat International Coalition's Housing and Land Rights Network), etc., and groups working on/with international forums on environment/biodiversity.

Steps:

- i. NHRC and MoEF to set up a joint working group of the above-mentioned organisations and networks, to examine the interface between HR and environmental instruments, and suggest concrete ways to synergise them;
- ii. Recommendations from this group to be circulated widely for comments and further refinement, through a series of workshops and dialogues;
- iii. Finalised recommendations to be pursued at relevant international forums, and implemented through appropriate measures within the country, including constitutional, legal, and policy measures.
- iv. MoEF and Ministry of Commerce to study whether the HR and environmental instruments are consistent with India's existing and emerging commitments to global economic/trade agreements, and, where there is inconsistency, to use the HR and environmental instruments as a defense against negative impacts of global economic/trade agreements.



7.1.11.5 Strategy: Use Other International Forums and Processes to Further Environment/Biodiversity and Livelihoods Concerns

Actions

1. Join and Influence the Global Biodiversity Information Facility

India to consider becoming a member of the Global Biodiversity Information Facility (GBIF), a forum for the effective exchange and use of biodiversity-related information. This needs to be linked to the proposed Indian Biodiversity Information System (see Section 7.1.1.2).

Justification: India has considerable expertise in information and database management, but can also learn from the relative strengths of other countries in this field. Such mutually beneficial links could be developed under a forum such as GBIF, while ensuring that concerns of biopiracy and unfair transfers are taken care of.

Suggested Responsibility: MoEF or Ministry of Science and Technology, with involvement of organisations handling existing biodiversity databases, and those who will handle the proposed IBIS (see Section 7.1.1.2).

Steps:

- i. India to consider applying for membership of GBIF through the relevant channels;
- ii. MoEF or other relevant ministry/department to set up a team/committee to assess what information can and cannot go to a global repository such as GBIF;
- iii. The team/committee to review the impacts of GBIF membership on neighbouring or other countries, where the impacts have been assessed, and accordingly recommend action for the Government of India.

