# Biodiversity Education, Awareness and Training Strategy and Action Plan

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**Centre for Environment Education**

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**Contents**

# 1. Introduction

This Strategy and Action Plan (SAP) is part of the National Biodiversity Strategy and Action Plan (NBSAP) for India. Preparation of an NBSAP is part of India's obligations as signatory to the Convention on Biological Diversity. The process for this has been facilitated by the Ministry of Environment and Forests (MoEF) with support from the Global Environment Facility (GEF). The NBSAP is a detailed micro-level plan for the conservation of the country's biodiversity. The execution of the project has been done by a Technical and Policy Core Group (TPCG) headed by Kalpavriksh, an NGO based in Pune, and comprising of experts from various fields and parts of India. The Biotech Consortium India Ltd. (BCIL) has coordinated the administration of the project.

This SAP focuses on Education, Awareness and Training efforts required to mitigate the loss of biodiversity, and to promote the conservation of biodiversity. It outlines a strategy and prioritized actions that need to be taken in the short, medium and long term to enable capacity building of identified sectors of society and governance systems, using education, awareness and training processes.

**Process**
A Thematic Working Group (TWG) constituted as per the guidelines suggested by the Ministry of Environment and Forests has coordinated the preparation of this SAP. The TWG consisted of:

The following methods were used to develop this SAP and to solicit inputs from various organizations and individuals:
1. Analysis of existing reports and documents:
2. Questionnaires to various individuals and agencies.
3. Monitoring of Minutes and the BSAPs of other executing agencies in the NBSAP process.
4. The second TWG meeting, was done as a workshop at Centre for Environment Education, with programme staff from CEE and other organizations in addition to the TWG members, as participants.
5. Inputs from parallel processes, which have synergy with the NBSAP processes, including from the Sub group on 'Education, Awareness, Integration of Wildlife Planning with other Primary Sectors and Identification of Priority Areas along with Financial Requirements for the same', which was part of the Working Group on Wildlife set up by the Planning Commission with a view to recommend a policy framework for the activities in the wildlife sector for the Xth Five Year Plan; Online discussions, hosted by CEE at its website [www.envirodebate.org](www.envirodebate.org)
6. Comments on the draft SAP, which was circulated for comments and discussions.

**About this document**
The section titled Challenges for Biodiversity Education, sets out the broad concerns and directions for Education, Awareness and Training efforts for biodiversity conservation. This is followed by a short introduction to the strategy, which identifies the sections of society, which need to be addressed on priority and which have strategic benefits in effecting change.

Section 4, titled 'Sectoral Action Plans' discusses the importance of the sectors identified, ongoing EAT initiatives for that sector, broad gaps in these, opportunities for EAT, and actions required in the future to either make use of opportunities of EAT for that sector, or add/ strengthen to existing EAT programmes.

# 2. Challenges For Biodiversity Education in India

1.  Conservation of diversity is neither a value nor an activity that can be undertaken in isolation of an appreciation of diversity—diversity of cultures, languages, lifestyles, beliefs, etc. Diversity and variety are a given in India—they are so inextricably a part of our lives, that we are not even necessarily conscious of them. They are a part of our lives, and traditionally, there has been an inherent acceptance, understanding and appreciation of diversity. And it is this appreciation of diversity, including of biodiversity that has sustained the richness of life around us.

    An important educational challenge is to see how we can keep alive this larger appreciation of diversity in our lives. Today's development paradigm is towards decreasing diversity in all walks of life and in collapsing it. True diversity is today getting replaced by 'brand diversity'. With a proliferation of brands, there is an illusion of diversity, while it is almost the same thing being that is being sold under different names.

    If we have to conserve our biodiversity, our education has to re-emphasize the value of diversity in every walk of life. It has to bring home that our diversity is our strength. From this, an understanding of the value of biodiversity and its conservation will follow.

    Linked to this is the need to conserve our traditional knowledge and systems, to document these, and to find innovative ways to build conservation systems based on these, as well as integrate these into the present-day systems of conservation.

2.  Linked to this specifically are our development policies that undervalue biodiversity. Whether it is forestry programmes which use exotics for afforestation, or agriculture policies which promote monocultures, our policies have not internalized the need for biodiversity in various aspects.

    There is an urgent imperative, therefore, to reach out to policy makers and decision makers, not only to sensitize them to these issues, but also to provide them information on alternative development paradigms and models, and authentic, specific, micro-level data and information on which they can base their policies and decisions.

    Decisions regarding the environment cannot be generalized, because they are governed by local physical, geographical and socio-political realities. Hence a 'one size fits all' approach to making policies, laws, and programmes is not always the best. While there can be guidelines and principals specified, on which decisions can be taken at the local level, biodiversity-related policies are not likely to work if they over-specify details, leaving no flexibility to the user at the field level. This too is an understanding that policy makers need to internalize.

3.  Another challenge for biodiversity education is to bring about the internalization of the reality that biodiversity conservation requires the involvement of various stakeholders. In a country like ours, where people are closely linked with the bio-resources, and are both the users and the traditional conservers of this, it would be impossible to conserve biodiversity without multi-stakeholder partnerships. Our policy makers and decision-makers need to be sensitized and oriented so that this becomes the fundamental premise for developing policies, laws and initiatives for biodiversity conservation. Significant initiatives have been made in this direction, especially in the area of Joint Forest Management. This needs to be consolidated and built upon in various other areas of biodiversity conservation.

With multi-stakeholder participation becoming a reality, there is also a need to reach out to the various stakeholders simultaneously, and capacity-build them to effectively participate.

4. The stress of the above three points bring to fore the importance and urgency of reaching out to the forest departments, agriculture departments, and other such organs of the government (both central and state), which are taking decisions which impact our biodiversity, and which need to be urgently sensitized. There is a need to reach out to various levels of these agencies, to orient and educate them, on an ongoing basis, with regard to emerging biodiversity concerns, perspectives, thinking, etc.

5. A fundamental challenge in front of educators today is that education itself is alienating us—from our resources, from our environment, from our traditions, from knowledge of our environment. Textbooks and classroom learning do not teach about what the child can see and experience. In fact, real life experiences of the child are not recognized as valid, or taken cognizance of. This leads to a situation where the child keeps academics and real life in two compartments, and does not see the linkages between the one and the other. This is inimical to the spirit of environmental education.

   The formal education process also does not give recognition or value to traditional knowledge and the knowledge of communities, accelerating the process of erosion of this knowledge. Educational planning has to be done so that not only is this knowledge recognized, but also given legitimacy and value.

   This would need re-thinking on education itself, at a fundamental level. This will happen only when educational planners and administrators are sensitized to these needs.

   Today's education is leading to alienation of young people from the immediate environment and its resources. Policy frameworks, which do not give stakes to communities in their resources further alienate people. In this situation, a key challenge before education today is how to re-awaken the sense of ownership of biodiversity among the people. For it is only with this that will re-kindle the traditional care and concern that communities gave to their resources and for environment.

6. Not the least of the challenges facing the educational community today, with regard to biodiversity education, is the fact that the role of Education and Communication are not adequately recognized as tools that are integral for biodiversity conservation. Education is seen as an add-on, as a luxury, as something to pay lip service to, perhaps. But it is still not seen as an integral part of a management strategy. Laws that do not have popular support will not work. Policies whose implications are not understood cannot be interpreted into effective action. A resource whose value is not communicated will not be valued and conserved. And for all this, education and communication are necessary.

The commercial world understands the importance of advertising and knows what results it can bring. Therefore, not only is advertising an essential part of a marketing strategy, but also, sufficient budgets are allocated to it. In the conservation world, even when education is recognized as a legitimate activity, nowhere near adequate resources are set aside for this. Education efforts therefore get reduced to tokenism—with a poster printed here, and a film made there.

It is essential that those involved in making policies and programmes for biodiversity conservation recognize the key role of education, integrate it into the strategies for conservation, and resource it adequately.

# 3. Strategy

The groups that Education, Awareness and Training efforts have to reach are wide and varied. The messages are complex. Hence, a great diversity of approaches is needed. While there is probably no section of society that falls out of the purview of biodiversity education efforts, the following groups have been prioritized as most significant:

**Key Sectors**
1. Public awareness and local communities
2. Formal education systems
3. Government agencies and decision makers
4. Information systems to facilitate decision making
5. Formal training systems
6. Industry
7. Specific professional and occupational groups
8. Groups with special needs

Strategies and actions have been worked out for some prioritized areas. However, several other areas require research and trials, and strategies and actions would evolve from these in the future.

There are several EE strategies that have been developed in the country now. It is important to analyze these at a macro level and choose appropriate strategies for different sectors.

For example, the Project Tiger used the tiger as a symbol of what is to be conserved - in order to protect the tiger, the whole habitat needs to be protected. Thus a logo, icon or concept, which is easily recognized or understood can form the fulcrum on which a deeper conservation action rests.

Today the awareness in India is such that there are people who fully realize environmental issues, and best practice for particular sectors of society. CEE's Industry Initiative has actively identified people from within the industry who have tried out cleaner production. Such individuals are the resource persons for developing programmes for reaching the rest of the industry. There is greater acceptance for change when someone from the same 'community' is able to show examples of success.

The strategy would be to identify these individuals and create forums for them to address the systems/ sectors they belong to. The challenge is how to find them, and how to support them in communication skills.

# 4. Sectoral Action Plans

This section prioritizes actions for the key sectors identified. For each of these sectors, ongoing education, awareness and training related initiatives/ efforts, opportunities for integrating biodiversity-related EAT initiatives, concerns and gaps in ongoing efforts, and actions desired in the future in the context of biodiversity conservation are described.

## Public Awareness and Local Communities

"How much are people empowered to conserve, manage, and benefit from biodiversity? Has there been a movement away from the centralized and iniquitous decision-making process relating to natural resources, towards more participatory, egalitarian processes? Is there an adequate move to providing tenurial and livelihood security to people who are most dependent on biodiversity? What more needs to be done towards this, especially to empower the most disprivileged sections such as the landless, adivasis, dalits, and in particular women and children within them? "

(Ashish Kothari, from note prepared for multi stakeholder consultation at Goa for gathering inputs for preparation of the India WSSD document, Jan 2002)

### Communities in rural and tribal areas

For tribal and most rural communities, biodiversity is the basis of survival – for religion, culture, livelihood, health and economic activity. For these communities, as for the whole country, the crisis is not just of loss of biodiversity, but also of the community knowledge associated with its use.  Community knowledge is diverse – it is specific to ecosystems, communities, gender, age and occupations.

Members of the community - healers, men, women, older and younger folk - have different roles and therefore different knowledge bases. As roles change, as people get "mainstreamed" and as the younger generation moves away from traditional occupations, these knowledge systems are getting lost. As economic, social and environmental changes occur, some occupations get marginalized or become irrelevant, and the related occupation-specific knowledge bases also get eroded.

Even where interested, the younger generation lacks confidence in traditional knowledge systems, which can be attributed to biases in formal education curricula and media. There is a need to learn from traditional teaching and learning methods, at home, and through the codified guru-shishya parampara. Modes of transfer of knowledge from one generation to the next need to be documented, learnt from, and encouraged as alternative paradigms that are as effective as, if not more, than formal systems.

In the Western Ghats, the general degradation of forests and conversion of natural areas to fields or urban lands is leading to the loss of medicinal plants such as *sandruk (Litsea glutinosa)*, and *jasund (Antiaris toxicara)*. Traditional healers use *sandruk* for fractures, and *jasund* for treating bloat in cattle. The younger generation wants to move away from family occupations, and does not feel the need for going to traditional healers. With few takers of traditional healing systems, knowledge of medicinal plants will die as the healers pass away

In the village of Mendha (Lekha), Gadchiroli district of Maharashtra, this is being achieved by village-led *abhyas gat* (study circles), in which topics of research and enquiry are initiated by villagers, and outside "experts" called by these villagers present their information and ideas. Together, the locals and the outsiders evolve a deeper understanding from various perspectives, and this understanding is then used by the gram sabha to take informed decisions.

India has had a strong conservation tradition, with a diversity of practices and beliefs. There is a need to develop innovative and creative ways of sustaining, protecting and encouraging such conservation traditions, in the contemporary context. A government scheme-like support or bureaucratic process may not work because this is best done when a uniform system is to be followed, unless the scheme is an enabling scheme. Recognizing that plurality of species is not independent of plurality of practice, the State must promote and support plurality of practices rather than enforce homogenous centralized norms. While suggestions and guidelines may be given, 'how to do it' must be designed according to local needs.

Traditional practices that support biodiversity conservation need to be documented and published as popular books. This is with respect to documentation both in 'story' format, as well as factual documentation. This information needs to be shared in the form of songs, stories and lessons from all over the world.

While documentation of local biodiversity and community knowledge is required, appropriate safeguards need to be built in and known, in the light of IPR issues. There is a great need for public awareness about laws and issues related to biodiversity, global and national values of biodiversity, biodiversity use, external threats, experiences of benefit sharing etc.

Along with biodiversity documentation, there is a need for mechanisms that can help local communities monitor natural resource quality and development outcomes in relation to development works undertaken.

Is there an example for this?

**Honey Bee network**
Honey Bee Network and SRISTI along with many other institutions and individuals have been involved in documentation, dissemination, experimentation and value addition to grassroots innovations. Honey Bee has developed a unique database of several thousand grassroots innovations in agriculture (herbal pesticides, tilting cart, three wheel tractor, growth regulators, etc.), natural resource management, veterinary and animal husbandry, poultry keeping, farm machinery, fishing, leather processing and vegetative dyes etc. The network also attempts to protect IPRs of the grassroots innovators and intends to share any benefits accrued from commercialization with innovators.
http://www.sristi.org/genesis.htm

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Jan Vachan Andolan
The Bharat Gyan Vigyan Samiti as part of its Campaign for Literacy and Libraries has published about 2000 titles in 14 languages, in vast numbers. Typically these books are about 16 to 24 pages, in simple language, and cost about Rs 1.50 to Rs 2.00. They have stories, pictures, songs, case-studies, articles about natural resource management, women's issues, school activities, science etc. The process of developing the books has included discussions with people, and then documentation of experiences and folk songs and stories. Some titles are translations of stories from other countries, and others are authored books.
Source: Oral communication with Vinod Raina, Nagamani and Datta Desai.

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If maps of India showing the areas of highest poverty, the areas of tribal concentration and the forest areas are overlaid, they show an incredible overlap. One way of reading this correlation is that the existence forests and the lack of urbanization and industrial growth is the reason for the continuing poverty of these regions. Another way would be to say that the development strategy in these areas needs to look at forestry as a key resource and opportunity. It is somewhat this thinking that led the people of these predominately tribal areas to agitate for separate states within India. After several decades of agitation, often violent, the new states of Jharkhand and Chhattisgarh in predominantly tribal and forested areas have been created a few months ago. Today they are exploring alternative development strategies. [1]

It is important that Ecodevelopment and Joint Forest Management are properly understood as development tools, and the institutional mechanisms to facilitate these created.

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[1] Kartikeya V Sarabhai. Beyond Forestry: Community Forestry in the Context of Development. May, 2001

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**Communitry Based Monitoring**

About 3500 soligas live inside the Biligiri Rangaswamy Temple (BRT) Wildlife Sanctuary in Mysore district. They used to practice shifting agriculture, which was progressively banned, particularly after the area was declared a wildlife sanctuary. The Soligas are now settled in hamlets called 'podus'. It is estimated that 30% of the Soliga households have agricultural land around their respective podus. The remainder households rely on harvest of non-timber forest products or employment to sustain their livelihoods. The non-timber forest products are partly used by the Soligas for their own consumption and partly sold to the traders through cooperative societies called LAMPS, (large-scale Adivasi Multipurpose Societies).

In order to provide economic incentives to the Soligas to sustainably use biological resources, enterprises based on the processing of non-timber forest products were established in 1994 as part of a project initiated by the VGKK and Tata Energy Research Institute (TERI). These enterprises, operated and managed by the Soligas included a honey processing plant, a food processing unit, and a herbal medicinal plant unit.

A program to monitor the performance of enterprise units and their impact on the income of the Soliga household was also initiated. Other parameters for monitoring included household determinants of forest resource use, overall changes in biodiversity, production, extraction and regeneration levels of selected non-timber forest product species, and changes in institutions and policies.

Participatory resource monitoring was and remains the key element of the project. The objectives of the participatory resource monitoring are to continuously estimate production, extraction and regeneration levels of non-timber forest product species. The participatory resource monitoring is organized at the podus level and undertaken by harvesters themselves. The records of quantities available and extracted are maintained by the harvesters as well as the staff of the enterprises.

Manuals on participatory resource monitoring have also been prepared. A general manual describes the objectives of participatory monitoring and the parameters to be monitored. Manuals for each specific species describe in detail the natural history of the species, temporal data on production and extraction, harvesting techniques and the key ecological and economic parameters. Initially, these manuals were prepared by the researchers and translated into Kannada. Subsequently, a simpler manual with illustrations was prepared for the use of the community. More recently, the communities themselves have prepared resource maps showing production and extraction levels. Furthermore, a separate manual has been prepared for the trainers and professionals in voluntary organizations. This manual too, describes the objectives of resource monitoring and the parameters for which data should be recorded.

Source: Communitry Based Monitoring Sub theme draft SAP

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Tourism and Ecotourism are being promoted as income generating opportunities. In areas of existing and potential tourist activity, it is important that communities understand how tourism impacts natural resources, the local economy and the social fabric of the community, how they can make the most of the opportunity while providing safeguards for themselves and their resources.

Strategy
1. Work with communities to strengthen community knowledge
2. Enhance biodiversity documentation
3. Enhancing awareness of current biodiversity issues among local communities
4. Strengthen Ecodevelopment
5. Strengthen Joint forest management
6. Develop ecotourism as a means of income for local communities
7. Popularize technologies for sustainable development
8. Document and disseminate experiences of environmentally sound farming

| Desired Action | Priority | Timeframe | Key players |
|---|---|---|---|
| *Working with communities to strengthen community knowledge*<br>Document, develop and widely disseminate popular District Biodiversity books/booklets using learnings from the Literacy Mission experience, which document traditional knowledge of biodiversity. This must be done by/with local people, not just by outsiders, and should include:<br>1. community systems of teaching and training.<br>2. information, knowledge and understanding of agrobiodiversity that rests in rural communities<br>3. traditional home gardens, and the biodiversity therein[2] .<br><br>The documentation should not only consist of descriptions of knowledge systems and its use, but also information on the threats to its survival.[3]<br>Particular emphasis must be placed on practices that recognise environmental limits to sustainable to exploitation of the resource. [4] | 1 | 1 year to initiate and ongoing | MoEF to initiate a scheme for this |
| *Enhancing biodiversity documentation*<br>In the context of biodiversity registers, a mechanism needs to be evolved to link barefoot taxonomists and scientists of BSI/ ZSI/ Fisheries Survey of India.<br>1. Develop appropriate material in a variety of formats (print and AV), including identification keys, for 'barefoot taxonomists' to enhance identification and information in biodiversity registers.<br>2. Facilitate training for this, using the experience of preparation of CBRs so far, including that of resource monitoring in the BRT Sanctuary by the Soligas. | | | |
| *Enhancing awareness of current biodiversity issues among local communities*<br>Develop in simple formats with examples and illustrations, and widely disseminate in several local languages, books and booklets on<br>a. national and global values of local biodiversity, agrobiodiversity and related knowledge and the needs and ways of protecting them<br>b. IPRs, and innovative practices in benefit-sharing, for e.g. the Kani–TBGRI experience for arogya pacha<br>c. Negative consequences of exotics, hybrids and invasive species, and where information is available, on how to control them.<br>d. Threats to biodiversity<br>e. Environment and biodiversity related laws. | 1 | 1 year to initiate and ongoing | NGOs, NEAC |

[2] Home Garden sub theme draft SAP

[3] Indigenous Knowledge sub theme draft SAP

[4] Goa State draft BSAP

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| *Strengthening ecodevelopment*<br>1. Assess the need for ecodevelopment around all protected areas.<br>2. Prepare directory of individuals, NGOs, CBOs, institutions specifically working in and around PAs.<br>3. Using existing material and case studies such as that of Vivekananda Girijan Kalyan Kendra in the Biligiri Rangaswamy Temple Sanctuary[5], on ecodevelopment develop basic reference material for CBOs, in local language and in simple language to enable NGOs, CBOs and community groups to take up these activities.<br>4. In areas where there are significant human wildlife conflicts, develop and offer through state nodal agencies, a broad based training package to support specific community needs for initiating or strengthening sustainable biodiversity based livelihoods. | 1 | 2 years to initiate and ongoing | MoEF, WII, CEE, CPR EEC, NGOs and communities around protected areas.<br><br>State forest departments<br><br>Support possible from NEAC, EOSE, SGP. |
| *Strengthening Joint Forest Management*<br>1. Enable wide sharing through various media of experiences, which analyze success and failure.<br>2. Foster capacity building of NGOs to facilitate JFM<br>3. Sensitise relevant local departments to the JFM process, and step by step implementation. | | | |
| *Developing ecotourism as a means of income for local communities*<br>MoEF to set up a mechanism with the Tourism Ministry to establish nationally acceptable guidelines for recommended practices, codes of conduct and certification procedures. Use experiences of Ecotourism in other parts of the country, and if necessary take up pilot projects before a set of principles can be firmed up. A national workshop may be organized to facilitate this.<br><br>For pilot projects:<br>- Select tourism sites for pilot projects.<br>- Organization of stakeholders meeting at selected sites.<br>- Develop local strategies for conservation education through the sites, defining roles of various stakeholders, and assessing capacities.<br>- Conduct training programmes for stakeholders, including officials, community groups, tour operators, and hotels for the functioning of the interpretation programme and other facilities.<br>- Develop and implement educational programmes for local communities<br>- Set up interpretation and other facilities and hand over to the appropriate government and community institutions. | 2 | 5 years | State Forest deptt, NGOs, people's institutions in selected site, Indian Inst of Tourism Management EQUATIONS |

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[5] Community Based Monitoring subthematic draft SAP

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| *Strengthening understanding of impacts of tourism and the role of local self government institutions[6]*<br>In areas of high tourist visitation, and potential visitation, conduct workshops with local authorities and local communities about<br>&bull; Rights of panchayats regarding tourism development in the area, and expectations of tourism industry.<br>&bull; Management of tourism sites<br>&bull; Visitor behaviour in tourist sites. | | | |
| *Popularising technologies for sustainable development*<br>Prepare and publish popular material in local languages documenting the use of ecofriendly technologies. | | | National Innovation Foundation, ENVIS Centre for Appropriate Technology, NGOs |
| *Document and disseminate experiences of environmentally sound farming*<br>Document and disseminate success stories of farmers who are following traditional systems of cropping with good yields, of farmers who are cultivating traditional crops, which are on the verge of extinction, should be documented and in turn utilized for creating awareness in the farming community.[7] | | | |

**Communities in urban areas**
In many urban areas, despite the general human disturbance, there are biodiversity significant areas, especially important for the local ecology. Some cities (Bhopal, Chennai, Chandigarh, Delhi, Mumbai) also have protected areas and reserve forests. People living in urban areas are aware of wildlife and biodiversity in natural areas, but often do not appreciate biodiversity in their own urban environment. NGOs in these cities have been active in monitoring, and conservation of biodiversity in the urban areas.

There are hundreds of nature clubs that are helping create environmental awareness in young people. Some newspapers have taken an active role in promoting environmental awareness. There are examples of good practice in cities related to water use, waste management, greening etc.

However, there is a critical need to educate the urban citizen about the impacts of his/her consumption, and the ecological implications of urban lifestyles, as well as their increasing alienation from natural resources. There is a need for much greater public awareness, which can lead to action within cities for biodiversity conservation.

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[6] Tourism and Biodiversity sub theme draft SAP
[7] Deccan LAC draft SAP

Involving urban communities more actively in ward level issues can help bring a measure of responsibility and thought to local natural resource management. Museums, zoos, botanical garden can become an excellent educational resource to create awareness about the local resource conservation traditions, local culture, flora, fauna, ecosystems. Interpretation and awareness programmes at such facilities need to be strengthened.

Strategy
1. Popularise environmental best practices especially in ward level forums.
2. Enhance awareness about ecosystem services
3. Fostering awareness to action among citizens groups
4. Networking nature clubs
5. Enhancing awareness of macro biodiversity conservation and loss
6. Promoting awareness of lesser known foods biodiversity
7. Linking consumer education to lifestyles
8. Enhancing the role of museums, zoos, botanical gardens

| Desired Actions | Priority | Timeframe | Key players |
|---|---|---|---|
| *Popularize environmental best practices* <br> 1. Document and publicize through media and NGOs, best practice case studies related to urban lifestyles and consumption modes, including waste management, water conservation in day to day life, greening urban spaces, ecorestoration of biodiversity rich habitats, etc. <br> 2. Capacity build public awareness / relations cells in municipal corporations and councils and NGOs to develop, adapt for local use and widely disseminate education/ communication material using a variety of local media based on the above to promote awareness among the urban populace. <br> 3. Develop methods to reach these to ward and locality level civic forums. | 1 | 2 years to initiate and develop core materials and capacity building is ongoing. | NIUA should support creation of such material by a variety of NGOs, in different cities. ENVIS Centre for Human Settlements <br><br> NEAC |
| *Enhance awareness about ecosystem services* <br> Develop small booklets, posters, slide shows etc about services provided by different ecosystems and natural areas in urban environs. Disseminate these to NGOs, nature clubs, and youth groups for use with their audiences. | | | |
| *Fostering awareness to action among citizens groups* <br> There is a need to link public awareness efforts to advocacy and legislation. For this, document and popularize through media, NGOs and in local languages, case studies of where public awareness has led to advocacy and action, especially in the case of biodiversity conservation. These could also have sections on 'what to do when …'. | 2 | Ongoing | NLSIU, Kalpavriksh, NCAS |
| *Networking nature clubs* <br> Networks of nature clubs, birding groups, youth groups should be supported/ enhanced for conducting rapid surveys / monitoring of key species, such as the vulture on a campaign basis. The IBA programme provides a basis for this. This experience may be integrated into the portfolio of EE agencies. | 2 | Ongoing | BNHS, WWF, CEE, |

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| *Enhancing awareness of macro biodiversity conservation and loss* <br> Identify case studies of examples where a) there have been unintended or indirect loss of biodiversity due to some major development intervention, and b) where biodiversity has been saved/ conserved due to various types of intervention. Generic learnings should be brought out from these examples, and these case studies should be popularized, in the mass media, to policy groups, training institutions and NGOs. | 1 | 1 year | CEE media groups working with Kalpavriksh |
| *Promoting awareness of lesser known foods biodiversity* <br> Initiate a biodiversity campaign in collaboration with commercial agencies for promotion of lesser-known varieties, such as of rice or mango. <br> Organize a workshop to orient well known individuals writing on food, hosts of TV programmes on recipes and home management on the importance of agro biodiversity, and work out ways of reaching this through these individuals to the general public. | 2 | 1 year | Advertising agencies, television channels and programmes on recipes, food, home care and nutrition ENVIS centre for EE |
| *Linking consumer education to lifestyles* <br> There is a need to more closely link consumer education and moving towards more sustainable lifestyles. Advocacy groups, legislators working on consumer issues need to take this into account. <br> Organize a workshop with following as outputs <br> - Strategy for linking consumer education to environmental issues and lifestyles, especially in urban high consumption families/ sector of society. <br> - Awareness strategy to reach consumers <br> - Work out ways of networking urban consumers with farmers producing diverse, lesser-known foods. | 1 | Ongoing | CERC, VOICE |
| *Enhancing the role of museums, zoos, botanical gardens* <br> - Organize workshops for managers, curators of museums, zoos, and botanical gardens on the potential of such sites for conservation education, and for tools such as interpretation and need for proactive environmental awareness campaigns and outreach activities. <br><br> Support may be accessed from ICOM for digitizing information on collections of natural history museums. | 3 | 4 years | CEE, NMNH, Museums Assoc. of India, National Museum, Support from ICOM, CZA, BSI, NEAC |

# Formal Education Systems

The formal education system in India provides a great scope for creating awareness about biodiversity and its conservation among children and youth, and through them reaching the community. However, there are gaps in terms of coverage of biodiversity, and the methodology of teaching. In particular, the formal

education system needs to create space for and give due importance to community/ traditional knowledge systems and practices.

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The Government of India periodically conducts All India Educational Surveys covering all states and union territories. The sixth survey was launched in 1993, with date of reference as 30 Sept 1993. According to the sixth survey, there are:
- 8,22,486 schools in the country, of which 5,70, 455 are Primary and 1,62, 805 are Upper Primary Schools.
- 15,3906,057 pupils enrolled in all the schools, of which 9.70,29,235 are in primary (I to V) and 3,40,71,058 are in Upper Primary (VI-VIII)
- 6,36,38,488 girls enrolled in all the schools, of which 4,18,81,186 are in Primary and 1,34,98,850 in Upper Primary
- 41,97,555 teachers (which forms about .42% of India's population) of which 16,23,379 are in the Primary level and 11,29,747 in the Upper Primary level
- 94% of rural population is served within 1 km at Primary stage
- 85% of rural population is served within 3 km at Upper Primary stage

Source: website of NCERT http://www.ncert.nic.in

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A major national study of environmental content in textbooks has been completed under the Environmental Education in the School System (EESS) sub component of the World Bank supported India Environment Management Capacity Building Project (IEMCB). The extent of biodiversity coverage in the curricula (of all related subjects) has been assessed. Phase II of this project (2001-2003) has the following activities:

- Development of state wise programmes, materials including syllabi, course books and plans for pilot implementation of strengthening EE in schools
- Pilot implementation in 100 schools in 8 selected states (Andhra Pradesh, Maharashtra, Goa, Assam, Orissa, Punjab, J and K, Uttaranchal), of the programmes developed and their continuous evaluation.

Some of the ongoing mechanisms for extra-curricular school-based environmental education include:

- National Green Corps - The Ministry of Environment and Forests has launched the National Green Corps (NGC) in an effort to intensify the Eco-clubs programme. The NGC is expected to cover about 55,000 schools (100 schools in each district).  The members of the Eco-clubs set up in schools would constitute National Green Corps (NGC) and would be involved in conducting not only awareness programmes but also action oriented projects like plantation of trees, cleanliness drives in their localities and public places like Railway Stations, etc. besides interacting with communities to educate them about environmental issues. The programme is being conducted through the State Governments/UTs who will be provided financial assistance by the Central Government for organisation of training programmes for teachers, preparation of locally relevant resource material and for conducting the activities of the Eco-clubs. Central Government would also provide resource material to the States/ UTs.
- Scheme for Environmental Orientation to School Education - The Ministry of Human Resource Development supports innovative school based environmental education projects through the Scheme for Environmental Orientation to School Education (EOSE). Over the years several school-based EE projects have been taken up in different parts of the country. These range from development of a variety of educational material including field guides, activity manuals, posters, audio-visuals, teacher training programmes, school activities, volunteer training etc.

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Pictures of some EOSE materials

Treasured Islands
Some NE materials
Sariska bird book/ DKYP

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- National Environmental Awareness Campaign - Small projects for environmental awareness are supported by the Ministry of Environment and Forests through the National Environmental Awareness Campaign (NEAC). Support is available to NGOs and schools. A recent evaluation of NEAC revealed that though the extent of support of small, many schools and NGOs have been able to conduct a variety of awareness programmes and have developed educational material.

Besides these, there are several examples of school-based EE in the country, including those of Kerala Shastra Sahitya Parishat, Uttara Khand Seva Nidhi, the Bharati Vidyapeeth Institute of Environment Education and Research, the Hoshangabad Science Teaching Programme, and CEE's National Environmental Education Programmes in Schools. These projects range from integrating environmental concerns into curricula and textbooks, to extra- or co-curricular activities to development of locale-specific materials and teacher orientation.

Some of the learnings[8] from such EE experiences include:

School System
- The school system, especially at the higher secondary level, is oriented almost entirely to examinations and results and has very less space to those activities and projects, which do not match this orientation.
- It is important to involve the school administration and keep them informed about the aims and purpose of any school EE project. This helps reduce the administrative problems likely to be faced by such projects.
- It would be effective to incorporate only those concepts, which are being already dealt at that particular level.

Text-book analysis
The way environmental concepts are treated in textbooks plays a pivotal role in enabling the teacher to effectively communicate environmental concepts to student. If done in a compartmentalized manner then they would mar the very nature and essence of the subject. Some aspects that require careful consideration while attempting infusion are: what is being said through the text-book, how correctly is it said and what is the possibility for teachers to put the concepts into a local context.

Evaluation
The conventional examination system is designed to test transfer of information. However, environment as a discipline is not just about transfer of information. As a result, many teachers, students and parents do not perceive it as a curriculum priority. This, perhaps, is one of the biggest obstacles to EE. It is important to invent mechanisms in which abilities like decision-making, analytical thinking etc. can be evaluated. The website <www.comminit.com> gives information on such evaluation methodologies.

Teacher training
The key to any change in the formal education system is the teacher. It is important that teachers be oriented to the philosophy with which environmental concepts are infused in the curriculum and textbooks, and trained to use appropriate methodologies towards communicating these concepts effectively. Teachers also need training in skills to develop their own innovative ways of teaching.

Resources
Availability of good resource material, teaching opportunities and sufficient time are some of the factors that can affect the delivery of EE. Good quality teaching material to which the teacher has easy access and

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[8] From *Towards Incorporating Major Environmental Concepts into Science Education in South Asia*, by S Jain, Meena R, CEE, 2001.

is easy to use, are some of the important pre-requisite for effective EE to take place. What makes a resource material a good resource material is a question that needs to be answered by keeping the general school scenario in mind. For example in the water quality monitoring projects (*Water Quality Monitoring*, CEE, 1995; *The Green Teacher*, CEE, 1997 and *Pani Parikshan*, CEE North, 2000), complicated tests like Biological Oxygen Demand, Chemical Oxygen Demand etc. were avoided, as these needed sophisticated equipments. Similarly while writing an activity to teach a concept, it must be borne in mind that there are sometimes over 60 students in a class. In such a situation it is obvious that the teacher would not use a methodology that would involve 10 students only. Thus it is important to create resources that are adapted to our situation and concerns. Other considerations are the number of copies, and the cost. In most states, the number of schools runs into several thousands, and thus 2000-5000 copies may not be sufficient. Also cost of the educational material has to be nominal, otherwise most schools will not be able to afford it.

While innovative small scale projects should be encouraged, a mechanism needs to be worked out to help integrate such learnings into the mainstream state run national and state level school systems. Both innovators and state run education agencies need to be able to share experiences and constraints. These experiences need to be analyzed for the extent to which they are able to provide area-specific, culture-specific, activity and discovery-based teaching learning environments, with matching teacher training. Do they strengthen/ build upon traditional/ community teaching systems?

A facilitating management requires decentralized capacity-building, which NGOs can become partners in. The formal school administration at national and state levels, the SCERTs, textbook bureaus and related state agencies must help create decentralized capacities, not only administrative but also academic.

Vocational and Technical Education and Training in Schools
The National Policy on Education accords priority to Vocational Education, with one of the objectives being enhancement of individual employability. The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), Bhopal operates under the overall umbrella of NCERT. The Institute acts as an apex level research and development organization in the field of vocational education and provides direct and academic support to programmes. [9]

Vocational education may be used as a method of creating awareness about and capacities to use ecofriendly technologies. However this would require development of specialized textbooks, teachers, teacher training etc.

Strategy
1. Using the EESS experience
2. Enhance the role of NGOs in school-based EE
3. Enhance EE in states opting for Education Guarantee Scheme
4. Enhance development of locale-specific biodiversity related material
5. Enhancing integration of eco-friendly technologies in Vocational and Technical Education and Training
6. Enhance interaction with teachers' networks
7. Integrate traditional knowledge systems in formal systems

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[9] http://shikshanic.nic.in/

**Education Guarantee Scheme**

The Government of Madhya Pradesh initiated the Education Guarantee Scheme (EGS) in 1997 to reach primary school facility to every child in the State. This is an effort at community-centered and rights-based education to provide primary education to all children in a quick and time-bound manner. Under EGS, the Government gives a guarantee to provide a primary schooling facility to the children in a habitation where there is no such facility within a kilometer within a period of 90 days of receiving a demand for such a facility by the local community. It operates on a decentralised basis through collaboration of the state government, local body/panchayat and the community. The EGS operates on a three way partnership to ensure the right to primary education:

- The **Community r**aises demand, identifies local resident to be guruji/teacher and provides startup space for school
- The **Panchayat a**ppoints the teacher, and oversees the functioning of the school.
- The **State Government** supports the school through grant for teacher's salary, arranges for training of the teacher, provides teaching-learning material, academic supervision and all inputs for quality.

Essentially, the EGS gives children a school on demand. *See Apna School box for an experience of integrating biodiversity education in 10 EGS schools.*

Rajiv Gandhi Shiksha Mission's Education Guarantee Scheme has recently been adopted at the national level by the Central Government. The governments of Uttar Pradesh, Rajasthan and Orissa had at their own launched the Education Guarantee Scheme (EGS) in their respective states. The EGS had also received the Commonwealth's Gold Award for innovation in 1998.

**Integrating Biodiversity Education in 10 Shiksha Mission Schools**

The Shram Niketan Sanstha, in Shahdol, MP, took up a small project to help children in 10 Shiksha Mission schools understand biodiversity. The objective of the Apna School scheme of the MP Government Rajiv Gandhi Shiksha Mission is to integrate schooling with real life experiences of children, to develop a scientific temper among children, and to inculcate democratic values in them. This is also interpreted as helping children understand their own environment.

The NGO led several teacher discussion and orientation sessions to take the teachers step by step into Through classroom discussion, project work and village melas teachers were able to enhance the understanding of local plant and animal species, and their interlinkages. Side by side, the understanding of biodiversity among teachers was also developed. Twenty teachers were actively involved in the project, and have become more aware of the importance of biodiversity conservation, the need to integrate into their teaching, and some methods of doing this.

The community at large has been exposed to biodiversity-related information and issues, through the interest generated by students at home, and through the Bal Melas. A storybook in Hindi about biodiversity has also been developed.

Sources:
http://www.fundaschool.org/
Project report by Centre for Environment Education and the Field Studies Council, supported by the Darwin Initiative.

| Desired Actions | Priority | Time frame | Key players |
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| 1. *Using the EESS experience*<br>a) Facilitate widespread sharing and use of the research and studies of EESS Phase I and the experience of Phase II, with a view to strengthening EE nationally.<br>b) Education Deptts in all states should make available time and space to integrate the EESS project findings into future curricula and textbooks to be developed in the state.<br>c) Develop and deliver a strong orientation and exposure programme for staff in SCERTs, DIETs, textbook bureaus and related institutions which provide insights into the best EE initiatives, projects, materials in different parts of the country, as well as help state education departments plan for how best these can be integrated into the schools system.<br>d) Realign pre and in-service training of teachers, based on EESS experience and the larger school based EE experience in the country. This would also involve development of a national policy to integrate EE in pre and in service teachers training. | 1 | Initiate immediately | MHRD, MoEF<br><br>CEE, BVIEER, State depts of education<br><br>State level NGOs involved in school-based EE<br><br>NCTE, NIEPA |
| 2. *Enhancing the role of NGOs in school-based EE*<br>Recognizing the role of NGOs in strengthening EE in schools, initiate a scheme for supporting (including capacity building and financial support) NGOs in each district, using the NEEPS experience.<br><br>Locale-specific biodiversity education, including development of educational material for this, can play an instrumental role in building positive attitudes among children, teachers and the community. Small locale-specific projects can greatly help to enhance regular school textbooks, which are generic for the entire state.<br>The Scheme for Environmental Orientation to School Education is an excellent mechanism for this and should be continued. | 1 | Initiate in 1 year, and keep ongoing | MHRD, CEE and partner agencies in each state and district,<br><br>Nodal agencies for EE and other NGOs. |
| 3. *Enhancing EE in states opting for Education Guarantee Scheme*<br>    a. Take stock of Shiksha Mission and Seekhna Sikhana experiences in MP.<br>    b. Identify NGOs in each state and district, especially in UP, Rajasthan and Orissa (states which have shown an interest in adopting the EGS model) to help strengthen EGS and create locale-specific material. | 2 | 2 years | UNICEF, MHRD, EOSE, relevant State Education Deptt, Local NGOs, EGS NGOs, CEE. |
| 4. *Enhancing development of locale-specific biodiversity related material* - Create special focus within existing schemes like NEAC, EOSE, and the NGC to develop biodiversity related material for schools, support biodiversity documentation by students, melas, and other activities. Also enhance these schemes with capacity building of NGOs for school-based EE. | 2 | Ongoing | |

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| ***Enhancing integration of ecofreindly technologies in Vocational and Technical Education and Training***<br><br>MHRD could set up a working group with selected high schools, polytechnics, Krishi Vigyan Kendras, small scale industries association, to work out possible sectors for vocational education, using ecofriendly technologies.<br><br>This would include developing course outlines, and working out mechanisms for instituting the courses. | 2 | 4 years | MHRD, PSSCIVE, Selected NGOs, ENVIS Centres for EE and Appropriate Technology |
| *Enhance interaction with teachers' networks*<br>1. Identify networks of teachers in various states, such as the Science Teachers' Association of Manipur, All Goa Science Teachers Association and Maharashtra Geography Teachers' Association, and map their activities.<br>2. Strengthen interaction with these associations, by supplying EE material for their newsletters, workshops etc. | | | Nodal agencies for EE, NGOs in school-based EE |
| *Integrating traditional knowledge systems in formal systems* (reference IK subtheme SAP)<br>Scientific institutions have an important role to play in validation of the knowledge systems. It is now recognized that a dichotomy between local and formal systems of knowledge is not real, and that any knowledge is based on a set of basic values and beliefs and paradigms. Therefore, there is a definite need to further develop scientific insights into the nature and scope of indigenous knowledge. The following activities may be useful in this regard:<br>1. Developing curricula and methods for formal training and education in indigenous knowledge systems for education and training.<br>2. Developing research projects aimed at assessing the possibilities and constraints of using indigenous knowledge under specific conditions. Such research projects should move beyond the first generation research projects, which aimed at demonstrating the value of local knowledge systems by focusing on successful cases of application. Second generation research projects shall focus on comparing application of knowledge systems across a range of circumstances and across disciplines to craft the indigenous sustainability science.<br>3. Developing new methods for incorporating local knowledge systems in natural resource management regimes through action research. | | | |

## Higher Education

A Supreme Court ruling of 1991 directs all colleges to introduce a course on environment in all undergraduate courses. The key institutional structure for incorporating environment and biodiversity concerns into colleges is the University Grants Commission (UGC).

NGOs have been working with colleges to involve undergraduate and post graduate students in different regions to take up a variety of biodiversity studies, close to their own place, along with their teachers.

There are a few examples of colleges having taken up such studies.

- Project LifeScape of Indian Academy of Sciences, Bangalore is involving students in a variety of biodiversity monitoring exercises and preparation of community biodiversity registers.
- In Pune RANWA has prepared an assessment of species diversity in the city, through college students. This includes studies on fungi, herbs, trees, aquatic insects and mollusks, ant genera, butterflies, fresh water fish, amphibians, reptiles, birds, bats, and wild mammals. These studies have been published in the Journal of the Ecological Society, Pune.
- The Bharati Vidyapeeth Institute of Environment Education and Research, Pune involves its MSc Environmental Science students in field studies and dissertations related to biodiversity monitoring and use, and biodiversity education.
- In Karnataka, CEE South has carried out an Environmental Quality Monitoring programme in 9 districts with 20 undergraduate colleges. CEE has prepared educational materials under its EnviroScope series for colleges, in collaboration with the World Resources Institute, Washington. CEE has also developed and is implementing a module on environment for the Gargi College, Delhi. CEE Central is also working with the Maharashtra Council of Agriculture Education and Research for assessing how the research projects taken up by the four State Agriculture Universities in Maharashtra, respond to various environmental concerns, including biodiversity.

*The Contracting Parties, taking into account the special needs of developing countries, shall: Establish and maintain programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biological diversity and its components and provide support for such education and training for the specific needs of developing countries.*

Article 12 Research and Training, Convention on Biological Diversity

Several universities do offer post-graduate courses in Environmental Science.

Concerns
- Most colleges have not actually introduced environmental courses.
- Field work needs to be built into the curricula of life science courses.
- The biodiversity component in the Environmental Sciences needs to be assessed.
- There is a need to promote taxonomy as a discipline, as well as to enhance expertise in under explored areas of biodiversity (e.g., lower plants, animals and micro organisms)
- There is a dearth of specialist courses on different aspects of conservation biology and environmental remediation.

Pictures of -
Shrustigyan manual
EnviroScope BD
Biomass and Water studies
BVIEER photo of student field work
RANWA Journal of Ecological Society

Any others??

The learnings from experiences such as those of Indian Academy of Sciences, CEE, Ranwa and BVIEER would be useful for developing appropriate curricula and material for colleges.

| Desired Action | Priority | Time frame | Key players |
|---|---|---|---|
| *Follow-up on Supreme Court ruling for introducing environmental course at undergraduate level.*<br>1. UGC to follow-up with all universities to report on how far and in what manner colleges have taken up the introduction of undergraduate course in all faculties.<br>2. UGC to work with universities to include dissertation projects based on biodiversity related field-studies at UG and PG level for Life Sciences, Environmental Sciences, Economics and Social Sciences with credits for the same.<br>3. UGC to work with MoEF to identify and contract an agency for developing teacher-training modules in biodiversity education at college level<br>4. Teaching of revamped syllabi at all levels, projects at UG and PG level to start .<br>5. Teacher-training modules at teacher-training institutes to be started.<br>6. UGC to support development of bibliography on materials already available.<br>7. Refresher courses for college teachers should have biodiversity components. | 1 | 1 year to initiate programme | UGC, all Universities MoEF EE nodal agencies, other identified institutions for every state to be associated with each university |
| *Fostering EQM, biodiversity mapping and census projects*<br>1. University life science departments to develop and foster linkages between colleges and State Forest Depts in order to include college students in monitoring and census work.<br>2. State Forest Depts should initiate periodic training for college teachers, students to train them in monitoring and census techniques. | | | UGC, Local colleges, Indian Academy of Sciences, CEE, WWF, other NGOs, State Forest Deptts |

**Professional education**

There is a need to integrate biodiversity and environmental concerns into specific professional courses, especially those professions that influence use of and impacts on natural resources, and environmental management. These include agriculture, some engineering courses, law, and communication/ journalism.

| Desired Action | Priority | Time frame | Key players |
|---|---|---|---|
| *Strengthening Environmental law training*<br>Bar Council of India should direct all universities offering law courses to introduce Environmental Law as part of their regular programme. The experiences of NLSIU, CPR EEC, WWF, Cochin University and others should be considered while devising the course curricula, teaching material and methodologies. | 1 | 2 years | Bar Council of India, NLSIU |
| Engineering courses that impact natural resource use include civil, mining, chemical, production, etc.<br><br>Develop basic course guidelines, as well as materials on environmental concerns, as well as discipline-specific content on | 1 | 2 | AICTE |

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| energy conservation and efficiency, minimizing impact, remediation, regulations, etc.<br><br>Direct all engineering colleges to adopt such courses. | | | 24 |
| *Strengthening Print and AV Journalism courses*<br>University departments of journalism, EMRCs can be focal points for<br>• introducing specific environment and biodiversity related courses in the existing formal programme as electives.<br>• organizing 'continuing education' sessions on these aspects for contact classes in a distance learning mode.<br>For this<br>• develop web based distance learning modules<br>• identify individuals across the country who can be guides for journalists taking up the courses.<br>• Publicize widely to all print and AV journalists and university departments as electives.<br>Work with UGC and universities to expand the curriculum for undergraduate as well as postgraduate programmes in communication and journalism to include environmental journalism as an important aspect. Where possible, this can be done by broadening existing subjects such as development communication or development journalism. | 1 | 2 years | Depts of Journalism, UGC EMRCs<br><br>Journalists associations<br><br>Centre for Media Studies, CEE media programme |

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| *Integrating biodiversity concerns into agriculture education and research*<br>Initiate a participatory process of ICAR, SAUs, specialised institutions supported by ICAR, KVKs to examine the integration of biodiversity concerns into agricultural education and research. This would require MoEF and Ministry of Agriculture to develop an NBSAP-like project for the ICAR-SAU system.<br>For this, organize a national workshop to develop guidelines, create interest and stakes among the formal agricultural education and research community.<br><br>Alternatively,<br>A document emerging from the NBSAP process, consolidating the concerns for conservation of domesticated biodiversity, agro ecosystems, livelihood security of agriculture based population, nutrition related concerns etc should be prepared and discussed with the MoA and the ICAR. Based on this,<br>1. ICAR to commission evaluation studies for all faculties for incorporating BD concerns in undergraduate and postgraduate courses, to be done with agencies identified by MoEF (drawing upon the expertise available in the institutions/ individuals of the TWG on Domesticated Biodiversity).<br>2. ICAR to commission a project for revamping student projects/ field experience terms to include biodiversity studies.<br>3. Syllabi to be modified to incorporate biodiversity concerns.<br>4. ICAR to work with MoEF to identify and contract agency/ agencies to develop appropriate instruction material for different faculties.<br>5. Identified agencies to work for instructor orientation. | 1 | Imme-diate | MoEF (also involving individuals from the NBSAP TPCG, Domesticated Biodiversity TWG)<br><br>Ministry of Agriculture ICAR-SAU system State Deptt of Agriculture |
| *Strengthening agricultural extension*<br>1. Assess technologies developed by the SAUs, to select those that are supportive of biodiversity conservation, and are especially appropriate for women and marginal farmers. These should be tried out in field situations with community groups, through NGOs, specific line departments (agriculture, women and child welfare etc). Learnings from these to be shared with researchers and community groups. Selected successful technologies to be absorbed in schemes of line departments.<br>2. Capacity-build SAU extension faculties in innovative methods of extension, using examples of technologies supportive of agro-biodiversity conservation.<br>3. Reformat dissemination of technologies to providing options of packages of practices as per resources available (land amount and quality, money, labour) with especially small and marginal farmers, rather than only crop specific packages.<br>*4.* Strengthen women's colleges and courses in agriculture. | | | Relevant line departments, NABARD, NGOs working with communities. NIRD and SIRDs Some support possible for NGOs through SGP. |

# Government Agencies and Decision Makers

Government agencies and decision makers need to be addressed at the following levels:

- Planning (Central and State)
- Legislature (Central and State)
- Executive/ Administration (Central and State)
- Local self government institutions
- International - Government agencies negotiating on behalf of India in international fora.

## Planning in India

India has followed the Five Year Plan process since 1950. The Planning Commission headed by the Prime Minister, draws up five-year plans under the guidance of the National Development Council to ensure growth, self-reliance, modernization and social justice. Its role has been redefined in the eighth plan document: from a centralized planning system, India is moving towards indicative planning which will outline the priorities and encourage a higher growth rate.

Over the years, India's Five Year Plans have continued to emphasize poverty eradication and attainment of economic equality and social justice as key objectives. The Eighth Five Year Plan (1992-1997) identified human development as an overarching goal of development. The Plan incorporated strategies to create jobs, contain population growth, eradicate illiteracy, universalize elementary education, and provide safe drinking water and primary health care facilities to all. A commitment to achieve the goal of human development has been reiterated in the Ninth Five Year Plan (1997-2002).

The Approach Paper to the Tenth Five Year Plan discusses the connection between environment conservation and economic development.

*"There is enough empirical evidence to establish that environmental conservation must go hand in hand with economic development because any economic development which destroys the environment will create more poverty, unemployment and diseases and thus cannot be called even economic development."* Planning Commission, Government Of India Approach Paper To The Tenth Five Year Plan (2002-2007). New Delhi, September, 2001.[10]

The linkages between livelihoods and biodiversity/ other natural resources and sustainability issues need to be understood and internalized by all working groups and built into the designing and budgeting for the programmes finally taken up.

Another area that requires attention, especially in the light of increasing decentralization, is the need for capacity building at various levels. Programme and schemes need to adequately budget for awareness, training and capacity building activities. This requires that planners be exposed to the role of education, awareness and training as tools of change, and the extent of resources required for these.

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[10] http://planningcommission.nic.in/

A mechanism needs to be worked out to strengthen the understanding of biodiversity related information and concerns, as well as education, awareness and training tools, and integration of these in detail into the planning process at national and state level for future five year plans.

Strategy
1. Orienting national planning agencies, through setting up 'shadow' working groups, preparation of briefing notes and workshops.
2. Orienting state planning agencies, through briefing notes, seminars and field visits.
3. Enhancing recognition of EAT as a tool of change, through documentation and dissemination of case-studies.

| Desired Action | Priority | Timeframe | Key Players |
|---|---|---|---|
| *Orienting national planning agencies*<br>Biodiversity concerns need to inform the planning process, especially for sectors that directly impact biodiversity use and conservation: Education, Women and Child Welfare, Agriculture, Chemicals and Fertilizers, Commerce and Industry, Forests and Wildlife. Educational inputs such as orientation programmes of working groups in the planning process are necessary. It is also important to support these groups with usable sector-specific information. A suggested mechanism that could be set up by MoEF towards this:<br>- Set up 'shadow' working groups in advance of the Planning Commission's working groups. Groups and individuals who have developed the thematic SAPs could form the nucleus of these 'shadow' working groups. The task would be to prepare sector-specific briefing documents on biodiversity use and conservation and the relevant linkages for the Planning Commission working groups. These notes should also have specific recommendations for education, awareness and training requirements in these sectors.<br>- Based on these notes, a presentation and orientation kit containing overall biodiversity concerns, as well sector-specific recommendations could be prepared.<br>- Presentation workshops for the relevant Planning Commission working groups, could then be organized when they are set up for the next plan. | 1 | Immediate upon acceptance of BSAPs. | MoEF<br>Planning Commission |

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| *Orienting state planning agencies*<br>- Orientation material and presentation kit on the lines of that prepared for the Planning Commission need to be prepared for use at State Level. Adaptations should take into account local biodiversity concerns and can be based on state SAPs.<br>- A series of seminars and field visits is needed for State Planning Boards and working groups, to help understand the issues of and to integrate biodiversity concerns, conservation methods and technologies into the state developmental programmes. These seminars should focus on how biodiversity concerns can be integrated into various programmes and schemes at state level.<br><br>For e.g., in schemes related to agriculture, integrate the facilitation of seed banks at Panchayat level, agricultural technology, IPM, INM; in schemes for watershed development, integrate use of local grass, shrub, tree species, local forage vegetation on village commons; in schemes for rural development, women and child welfare, and support to self help group, integrate opportunities for products and technologies that aid biodiversity conservation which can be used for income generation; in schemes for housing, promote the use of such technologies that reduce external high cost inputs and use local materials such as bamboo for roads and buildings; in schemes for social forestry, promote the use of local indigenous varieties that communities desire, and discourage exotics. | 1 | 2 years for development of core material and ongoing capacity building and orientation | MoEF, Ministry of Home Affairs (DOPT), State SAP nodal agencies State training academies to introduce regular courses for members of state planning boards, working groups.<br><br>This should ensure that relevant State Plan working groups actually undergo such orientation. |
| *Enhancing recognition of EAT as a tool of change*<br>Education and Communication are not adequately recognized as tools that are integral for biodiversity conservation. Education is still not seen as an integral part of a management strategy. Planners need to be exposed to the role of EAT in biodiversity conservation, and the scale of resources required for these to be effective. Documentation and discussion of case studies of how EAT can lead to change, at national and state levels is required. For this:<br>- Develop a format for identifying and documenting case studies of education, awareness and training related initiatives in biodiversity conservation activities, including both successes and failures, and the resources required for EAT activities.<br>- Commission media persons, and NGOs, for documentation of such case studies.<br>- Material produced out of this should be disseminated to relevant agencies and individuals involved in national and state planning.<br>- These case studies should also be made available to the agencies that would be taking up the implementation of | 1 | 2 years | MoEF to initiate scheme, and identify nodal agencies to execute it. |

| the NBSAP, so that they can integrate actions for capacity building (at the desired level and scale) in projects and programmes being taken up as part of the NBSAP implementation. | | | | 29 |
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This box indicates the working groups set up for the Tenth Five Year Plan. 'Shadow' working groups could be set up focusing on biodiversity and livelihoods linkages, and possible EAT tools for these.

| Box 1- Working Group for the formulation of Tenth Five Year Plan (2002-2007). ||
|---|---|
| 1. Agriculture Division<br>  • Agriculture Credit, Cooperation and Crop<br>  • Horticulture Development including Spices Aromatic and Medicinal Plants and Plantation Crops<br>  • Agriculture Infrastructure/ Warehousing/Rural Godowns/ Marketing/Post Harvest Management, Processing and Cold Storage, Trade and Export Promotion.<br>  • Crop Husbandry, Demand and Supply Projections and Agricultural Inputs<br>  • Agriculture Research and Education<br>  • Animal Husbandry & Dairying<br>  • Agriculture Statistics<br>  • Watershed Development, Rainfed Farming and Natural Resources Management<br>  • Agriculture Development in Eastern and North-Eastern India<br>2. Backward Classes Division<br>  • Empowering the Scheduled Castes<br>  • Empowering the Other Backward Classes (OBCs)<br>  • Empowering the Minorities<br>  • Empowering the Scheduled Tribes<br>  • Empowering the Disabled<br>  • Reforming the Social Deviants and Caring the Other Disadvantaged<br>  • Empowerment of Women<br>  • Development of Children<br>3. Communication & Information Division<br>  • Post<br>  • Convergence and E-governance<br>  • Information Technology<br>  • Telecom<br>  • Information & Broadcasting<br>  • Impact of IT and Telecom on Other Sectors of the Economy<br>4. Development Policy Division<br>Public Distribution System and Food Security<br>5. Education Division<br>  • Sports and Youth Affairs<br>  • Elementary and Adult Education<br>  • Vocational Education<br>  • Education for Disadvantaged Sections<br>  • Secondary Education<br>  • Higher Education<br>  • Technical Education<br>  • Art & Culture<br>6. Environment & Forest and Tourism<br>  • Environment<br>  • Forestry | 8. Housing & Urban Development Division<br>Urban Development, Urban Housing and Urban Poverty<br>9. Health & Family Welfare Division.<br>  • Health Care for Women & Children<br>  • Implementation of Population Policy and Rapid Population Stabilisation<br>  • Improving Micronutrient Nutritional Status of the population<br>  • Development of Human Resources for Health<br>  • Communicable Diseases<br>  • Health Economics<br>  • Health Cares Services<br>  • Health Education & IEC<br>  • Indian Systems of Medicine & Homoeopathy<br>  • Health Systems Research and Biomedical Research and Development<br>  • Non Communicable Diseases<br>  • Environment & Occupational Health<br>  • Improving Nutritional Status of population with special focus on Vulnerable Groups<br>10. Industry & Minerals Division.<br>  • Drugs and Pharmaceuticals<br>  • Fertilisers<br>  • Leather and Leather Goods Industry<br>  • Public Sector Reforms and Privatisation<br>  • Textiles and Jute Industry<br>  • Mineral Exploration and Development (other than Coal and Lignite)<br>  • Ship Building and Ship Repair Industry<br>11. MLP Division .<br>  • Hill Areas Development Programme/Western Ghats Development Programme<br>  • Border Area Development Programme<br>12. Power & Energy, Energy Policy and Rural Energy Division<br>  • Petroleum and Natural Gas<br>  • Coal & Lignite<br>  • Power<br>13. Programme Evaluation Organisation<br>  • Strengthening Monitoring and Evaluation System for the Social Development Schemes in the Country<br>14. Rural Development Division<br>  • Rural Poverty Alleviation Programmes<br>  • Decentralised Planning and Panchayati Raj Institutions (PRIs)<br>15. Transport Division<br>  • Civil Aviation<br>16. Village & Small Industries Division<br>  • Small Scale Industries (SSI) Sector<br>  • Food Processing Industries (FPI) Sector<br>17. Water Resources Division |

| | |
|---|---|
| • Wildlife<br>• Research & Education for E & F Sector<br>• Tourism<br>7. Financial Resources Division<br>• Savings<br>• State's Resources | • Rural Drinking Water Supply and Sanitation<br>• Private Sector and Beneficiaries Participation Programme<br>• Major & Medium Irrigation Programme<br>• Minor Irrigation Programme<br>• Flood Control Programme<br>• Command Area Development (CAD) Programme |

 (From: http://planningcommission.nic.in/)

## Central and State Legislative

There are about 2500 people's elected representatives in the Lok Sabha (545) and the Vidhan Sabha (about 2000). Elected representatives of the people influence the shape of development in the country to a very large extent. Sustainable development must inform the agenda of political parties, and vice versa the general public needs also to demand this of its elected representatives.

Existing or ongoing initiatives for orienting elected representatives to environment and development concerns include occasional programmes organized by institutions including the National Institute of Rural Development (NIRD) and the Centre for Policy Research in Delhi. The Centre for Science and Environment provided a detailed package on watershed management and drought to MPs. Sanctuary Magazine is dispatched to MPs regularly.

It is necessary to strengthen mechanisms for reaching biodiversity-related concerns to elected representatives, not only for shaping environmentally sensitive policy in the country, but also as a means of effecting sustainable development initiatives in their constituencies. It is important that members raise constituency-specific environment and biodiversity issues with a well-informed and balanced perspective, at parliamentary, assembly or local levels.

Opportunities for reaching out to elected representatives include newsletters and magazines such as Panchayat Raj update and Yojana, which are sent out regularly to MPs. As part of the NBSAP process, the NBSAP TPCG has prepared a list of politicians, who would be/ are interested in environmental issues.

Strategy
1. Identify channels to reach elected representatives, including through legislative committees, political parties, and institutions with existing programmes for them.
2. Service information needs of elected representatives, through constituency-based forums, seminars, website, information and presentation kit.

| Desired Actions | Priority | Time frame | Key players |
|---|---|---|---|
| *Identifying channels to reach elected representatives*<br>As preparation for reaching various political parties, make directories of<br>1. Relevant legislative committees at state and central level.<br>2. List of individuals to be contacted in each political party.<br>3. "Relevant politicians" from the point of view of geographical relevance, those who indicate interest in certain issues related to biodiversity use and conservation etc. Use list prepared by NBSAP TPCG as base for this.<br>4. Agencies that have orientation programmes and publications for elected representatives, are conducting research and advocacy on policy issues. | 1 | 1 year | ENVIS Centres for EE and Panchayati Raj |

| | | | |
|---|---|---|---|
| *Servicing information needs of elected representatives* Foster the development of study groups at the constituency level to facilitate, document and disseminate information, and generate dialogue, on local biodiversity issues.<br><br>These groups must include the concerned representatives, key local politicians (whether in or out of elected office), locally active environmental NGOs, academics, journalists and representatives of occupational categories whose livelihoods are closely dependant on the conservation of biodiversity resources. | | | ENVIS Centres for EE and Panchayati Raj |

| | | | |
|---|---|---|---|
| *Servicing information needs of elected representatives*<br>1. Develop a presentation kit on major biodiversity issues for the country. This kit can be adapted to the state level with state specific issues. The kit to be prepared for the planning agencies may be used for this action. Kit may contain various media products, e.g. booklets, CDs, slide shows, films, website, etc.<br>2. Document and disseminate case studies and information on environmentally sound development policy and examples of where it has been put into practice<br>3. Set up a mechanism in order to bring information and experiences relating to innovative strategies for conservation and sustainable development from across the country & the world to policy/decision makers. The mechanism should be one that can be easily accessed and provides regular and updated online information, to policy/decision makers. This mechanism could have as components email and web discussions, seminars, regular mailers on topics of interest, meetings with groups and individuals, request based supply of information.<br>4. Organize 'Greening Politics' seminars open to all political parties to discuss how sustainable development may become part of their own agendas. Such discussions may also help elected representatives to bring about environmental improvement in their own constituencies.<br>5. Provide forums for regular dialogue with other stakeholders especially biodiversity-dependent rural communities.<br>6. Network groups and individuals using the platform of their existing forums, i.e. committees, party meetings, party magazines, newsletters etc. | 1 | 1 year to initiate and ongoing | ENVIS Centres for EE and Panchayati Raj<br><br>Study Groups and Consultative Committees set up under the aegis of the Ministry of Parliamentary Affairs for Lok Sabha, Rajya Sabha, Vidhan Sabha and Vidhan Parishad.<br><br>Existing institutions that already have some programme for elected representatives - NIRD, Centre for Policy Research, chambers of commerce and industry, some state training academies. |

## Administration

National and state sponsored schemes exist for Ecodevelopment, joint forest management, promoting medicinal plants, which are being used to promote biodiversity conservation in the country. The Scheme for Environmental Orientation to School Education is helping to create a variety of locale-specific educational materials on environment, including those related to biodiversity.

At the Central government level, besides the Ministry of Environment and Forests, the Government of India's Ministries of Human Resource Development, Health and Family Welfare, Non conventional energy, Energy, Irrigation, Food and Civil Supplies, Agriculture; Urban Affairs and Employment, Rural Development; Small scale and rural industries, Women and Child Welfare; Tribal Welfare; Chemicals and Fertilizers; Coal and Mines; Commerce and Industry, Tourism and Transport, and Defence are directly linked to biodiversity.

The programmes of these ministries may not however adequately reflect concern for biodiversity especially impacts on biodiversity. It is essential that the values of biodiversity be understood, and appropriately integrated into central and state programmes and schemes.

The learnings from the Ecodevelopment, JFM, EOSE schemes need to be integrated into the various other Centrally sponsored and state sponsored developmental schemes, such as those for Women, Youth, Farmers, Employment (urban and rural), Watershed development, Micro credit, Social forestry.  This would help convergence, and make access and use of schemes easier and can help promote sustainable biodiversity-based livelihoods. This would require a reformulation of these schemes, and integrating space and resources for capacity building.

Strategy
Integrate biodiversity and capacity building concerns into national and state sponsored developmental programmes and schemes, through inter-ministerial/ inter-departmental workshops and working groups.

| Desired Actions | Priority | Time frame | Key players |
| --- | --- | --- | --- |
| *Integrating biodiversity and capacity building concerns into developmental programmes and schemes* <br> • Develop a forum for interaction with key ministries and departments both at Central and State levels, on biodiversity related issues, especially to introduce the NBSAP and specific sector SAPs as appropriate. <br> • Workshops/meeting with key functionaries of Ministries directly related to biodiversity (e.g. Agriculture, Employment; Rural Development; Women and Child Welfare; Tribal Welfare; Chemicals and Fertilizers; Coal and Mines; Commerce and Industry, etc) should be | 1 | 1 year | PMO, Ministry of Parliamentary Affairs, State Government, Chief Secretaries |

| organized by the MoEF to discuss the implications of the NBSAP and to work out ways of integrating recommendations into the programmes and schemes of each of them. These meetings and the plans emerging from them should especially integrate actions for capacity building at various levels in the new projects, programmes, and schemes being taken up. | | | |
|---|---|---|---|
| At the state level, programme and scheme wise consultative groups need to be set up to work this out in detail, and especially integrate biodiversity related curricula in capacity building/ training programmes related to these schemes. | | | State SAP coordinators, Environment Dept working with relevant line depts. |

## Local Self Government Institutions
*(The recommendations here are reading very much like formal training – should we hush this section??)*

In the rural areas of the country, Panchayat Raj Institutions are being formed as per the provisions under the 73rd Amendment, and the related state acts. All the state legislatures have not yet fully implemented the related state acts, especially for devolving funds to the local self-government bodies.

There are examples from Kerala and West Bengal that show how villages are using the provisions under the 73rd amendment to plan and use local resources according to local needs. However, in the majority of the country, at the local level, there is yet inadequate understanding of the powers available to local self-government bodies, and how the provisions may be used to enhance and sustainably use local resources.

Several institutions and NGOs are conducting training programmes for local elected representatives, especially women sarpanches, to explain constitutional provisions.  Such forums can provide an opportunity to integrate biodiversity and natural resource management concerns into training and capacity building programmes.

For tribal areas, programmes and schemes of the Ministry of Tribal Affairs are intended to support and supplement the efforts of other Central Ministries, the State Governments/UT Administrations and voluntary organisations through financial assistance, and to fill critical gaps taking into account the situation of the Scheduled Tribes. These comprise schemes for educational development, economic development and social development. Most of these schemes are administered by the Ministry of Tribal Affairs and are mostly implemented through the State Governments and UT Administrations and Voluntary Organisations as Central Sector or Centrally sponsored schemes. (Source: Website of MoTA)

The Panchayat Extension to Scheduled Areas (1996) has been enacted, as part of the process of empowering local self-government bodies. This empowers the Tribal Panchayats and Gram Sabhas to have control over minor forest produce, minor minerals, minor water bodies, in addition to the provisions under Eleventh Schedule of 73rd Amendment.

While the enactment of PESA is definitely a major step forward, empowerment of Gram Sabhas or Tribal Councils is needed to strengthen protection of community-conserved areas, including forests, wetlands, grasslands, marine/coastal areas, that are protected/ conserved for various reasons**,** of which sacredness is only one.

| Local Self Government Institutions | | | |
|---|---|---|---|
| *Enhancing sustainable natural resource management through Panchayat Raj Institutions*<br>Development of model course syllabi, materials and tools for training of Panchayat Raj institutions on biodiversity concerns. These should include<br>• local, national and global biodiversity concerns;<br>• threats to biodiversity<br>• linkages between biodiversity erosion and local livelihoods<br>• opportunities for sustainable use and enhancing livelihood security<br>• methods to document local biodiversity<br>• case studies of best practice<br>• accessing support, etc. | | | National Institute of Rural Development<br><br>ENVIS Centre on Panchayati Raj |
| *Adaptation at state level*<br>Adapt model training materials for locale specificity by the State Institutes of Rural Development, and relevant NGOs. | | | NIRD, SIRDs |
| **Tribal Panchayats** | | | |
| *Empowering tribal panchayats*<br>Develop a programme to help tribal communities realize their rights under PESA, develop guidelines for tribal panchayats, as well as for NGOs and state TRIs, on how tribal self-rule may be facilitated. This would involve:<br>- Development of content<br>- Development of communication tools and methods<br>- Development of delivery mechanism through TRIs and NGOs | | | NITA and the TRIs<br>NGOs working with tribal communities. |
| *Strengthening community conservation*<br>An innovative education/ communication strategy needs to be designed to strengthen traditional protection of community-conserved areas. | | | MHRD, NITA, NGOs, CBOs working with tribal communities. |

## International

How far is biodiversity integrated into trade relations, especially into the decision-making process at international levels (from single corporations to multilateral processes like WTO)? Are the potential and actual contradictions between WTO agreements on one hand the CBD on the other, both internationally and in their domestic manifestations in India, being resolved?

Are the steps being taken towards the protection of biodiversity and indigenous knowledge from biopiracy, both domestically and internationally, adequate? What more needs to be done? How should countries like India respond to the growing forces of biopiracy, and the attempts to force one single model of IPRs on every country? How can we move towards a credible and effective sui generis system for indigenous resource and knowledge protection, which avoids the pitfalls of the Plant Varieties and Farmers Rights Act? Will the Biodiversity Bill help towards this?

India has been actively participating in negotiations of international environmental treaties. These include, besides the Convention on Biodiversity, the UN Framework Convention on Climate Change, Montreal Protocol, Kyoto Protocol, CITES, and international programmes such as Man and Biosphere, Biospheres Reserves Programme.

It is essential that the provisions for public awareness and education in these treaties be made use of.

There is a great need for civil society awareness about international treaties and environment and development negotiations. People need to know about the international laws, and how these affect them.

The Ministry of External Affairs (MEA) and the relevant ministries who negotiate environment and trade treaties must organize multi-stakeholder consultations for taking inputs from local communities, NGOs, academics, trade unions, media etc to develop India's perspective.

Learnings from the process of development of the NBSAP in India and the experiences of the multi-stakeholder consultations, media campaign, school competitions organized in the country as preparation for the World Summit for Sustainable Development should be used by the MoEF to develop a framework of enhancing civil society awareness about and participation in developing the national perspective for various international negotiations.

| Desired actions | Priority | Time frame | Key players |
|---|---|---|---|
| Using the experiences of the NBSAP India process and the WSSD preparation process, develop a framework for public awareness about key international treaties, and methods of soliciting inputs from a variety of stakeholders in the country.<br><br>Take up public awareness activities and processes for development of India perspectives for each of these treaties using this framework. | | | Ministry of External Affairs, MoEF and relevant ministries for all treaties that affect biodiversity |

# Information systems to facilitate decision making

Data gathering and data dissemination are two aspects of information servicing to facilitate decision-making.

Some of the widest national data collection and statistical systems in the country are the census and the National Sample Survey Reports. Environment and natural resources related data collection systems include those of the Botanical Survey of India, Zoological Survey of India, Fisheries Survey of India, Survey of India. Remote sensing data is gathered by the National Remote Sensing Agency, the Space Application Centre and related state agencies.  The Coastal & Ocean monitoring Predictive System (COMAPS) is a long term monitoring program under the Department of Ocean Development. Over the last decade, the COMAPS program has collected extensive quality data along the coastal waters of India. Several other institutions, including research and academic institutions gather specialized data.

The Forest Survey of India provides broad data on forest types and extent. The State forest departments conduct the annual wildlife census. For each protected area, management plans, which require documentation of information about the protected areas are supposed to be made. Besides, there are research studies conducted by agencies such as the BNHS, WII, SACON, universities etc. Several NGOs, nature and youth clubs in the country go into the forests for bird watching, nature camps and studies, photography, and have prepared flora and fauna lists.

Some data gathering institutions also have a mandate for information dissemination and public education and awareness, such as the BSI and the ZSI.

The Ministry of Environment and Forests has set up the Environmental Information System, as a step towards integration of national efforts in environmental information collection, collation, storage, retrieval and dissemination to all concerned. INFLIBNET hosts a database of research theses titles on the internet.

Municipal Corporations are required to make Environment Status Reports (ESR) every year, and use this for planning. Pune Municipal Corporation, Pimpri Chinchwad Municipal Corporation and some other municipal corporations in Maharashtra have prepared their ESRs.

In rural areas, techniques to generate local data already exist, such as Participatory Resource Mapping and Community or People's Biodiversity Registers. Where these have been used, techniques like participatory resource mapping lead to much greater resource literacy and foster local decision making for resource use. The necessity of the link between data providers and data users is well illustrated in such situations.

A major concern in information gathering and availability is that local level data is generally not available. With increasing decentralization, panchayats, taluka and district administrations are making the decisions that impact local development. These decisions are not necessarily guided by environmental concerns or natural resource or biodiversity related information. This may be both a human resource issue as well as an information availability issue.

In rural areas, while techniques for local level data gathering exist, such exercises are not mandatory. The techniques for gathering and using such data also require some measure of capacity building, especially in panchayat institutions and women members. There is also a need for developing systems that can help local communities monitor development outcomes relative to resources used.

In urban areas, while municipal corporations are required by law to make their annual environmental status reports, most cities do not yet have a single ESR. Where prepared, these are not actually used in planning, nor are they easily available. In some cities, ESRs have been prepared, but they are not updated annually.

The process of preparing management plans for protected areas has not been completed in most cases. Where completed, information available is sketchy in many cases.

Each state used to produce district gazetteers, which recorded a variety of information. Such gazetteers have been prepared for most districts. The preparation of gazetteers has now become erratic, however, the gazetteers continue to be a very useful source of information.

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**ENVIRONMENTAL INFORMATION SYSTEM**

**ENVIS is a decentralised system with a network of distributed subject oriented Centres ensuring integration of national efforts in environmental information collection, collation, storage, retrieval and dissemination to all concerned. Presently the ENVIS network consists of Focal Point at the Ministry of Environment and Forest and ENVIS Centres setup in different organisations/ establishments in the country in selected areas of environment. With assistance from the EMCBTAP, MoEF plans to set up 90 nodes by June 2002.**

**ENVIS is also the National Focal Point (NFP) for INFOTERRA, a global environmental information network of the United Nations Environment Programme (UNEP).**

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Strategy
1. Document and publish state and district level, and protected area related biodiversity information in a gazetteer-like format.

2. Foster proactive and strategic information dissemination

| Desired actions | Priority | Timeframe | Key player |
|---|---|---|---|
| *Documenting and publishing local biodiversity information* A gazetteer-like document, which would be easily available to those interested (including bureaucrats, academics, students), should be prepared for every district, and significant biodiversity rich areas outside protected areas. This would involve <br>• Developing a format for the content <br>• Identifying sources of information and methods of information collection <br>• Developing a mechanism for updation <br>To start with a state biodiversity gazetteer should be developed for every state. | 1 | 3 years | MoEF ENVIS Centre for EE, NGOs, colleges, local communities |
| *Information related to protected areas* <br>1. Prepare a gazetteer-like document for each PA and for proposed new PAs, to contain information on the wealth of biodiversity and conservation issues. Evolve guidelines for this and allocate responsibilities within the PA management for this. <br>2. Encourage local colleges and institutions to undertake regular monitoring studies of protected areas, and to take part in census work. | | | Proposed State Biodiversity Authority/ Board <br><br> State forest dept, Colleges and NGOs |
| *Proactive and strategic information dissemination* The MoEF has the ENVIS system, which is a mechanism to provide and update data and information about various environmental aspects. Under the EMCBTAP, 90 nodes on various disciplines are to be set up by June 2003. <br><br> MoEF ENVIS Focal Point should support the ENVIS Centres and nodes to proactively disseminate their biodiversity related information to various sectors of society, and especially to relevant government departments. This would entail: <br>1. Workshop on planning strategic communication activities, especially considering the information implications of implementing the NBSAP. <br>**2.** Evolving guidelines for the ENVIS centers and nodes for strategic communication and information dissemination, based on this workshop. <br>**3.** MoEF to make appropriate financial allocations to the Centres and nodes to support above activities. <br>This may mean that ENVIS Centres will need to define for themselves where they will access information and in what manner. | | | MoEF ENVIS Focal point <br><br> CEE as ENVIS EE node can take up the responsibility of helping build capacities in ENVIS nodes in communication. |
| FROM UNDP website India has been a pioneer in development of national statistical systems among developing countries. The census provides a wealth of information. National Sample Survey Reports have proved very useful to policy makers and scholars alike. The Sample Registration System complements other sources of information. | | | |

The sophistication of the statistical system at the national level is not matched at the state and district levels. States and districts are at the cutting edge of development action. Decisions which touch the lives of people are made by panchayats, district and taluka administrations.

The best decisions will flounder if they are based on bad data. Transparency and accountability depend on citizens' easy access to reliable information and data. Reform of data systems and generation of appropriately disaggregated data require:

- capacity development to improve state directorates of economics and statistics.
- improved reliability and coverage of sample surveys with qualified personnel deployed in all districts.
- special incentives for district statistical officers, and village level functionaries viz. *patwari* and the *kotwar* who provide primary data.
- greater interaction between providers and users of data .
  - o building capacity in panchayat institutions (particularly women members) to enable them to seek and use relevant data to discharge public obligations.
- people's participation in data collection and "planning from below".
- better maintenance of reporting mechanisms and equipment.
  - o simplified and gender sensitive reporting formats capturing outcomes and impact rather than events and activities.

Some states have been responsive to people's demand for more freedom of information. In Rajasthan a movement predominantly led by women has forced authorities to decree district and taluk offices to make available more information on how resources have been utilised for development purposes. Besides a vibrant and free press, the willingness of people to act in various public fora in their capacity as responsible citizens can prove to be the best antidote to inertia , apathy, and corruption in public life. A prerequisite for ensuring accountability is an effective system of information collection, analysis, and dissemination at all levels of society. Most urgently required is a system that can help local communities monitor development outcomes relative to resources used.

http://www.undp.org.in/report/IDF97/idfaccnt.htm

# Formal Training Systems

There are several training institutes and systems for administrators and managers in India. These include the cadre-based systems for induction and in-service training of the national and state civil services, public service commission and the IFS. Besides, there are specialized institutes for in-service professionals and NGOs, for short-duration subject specific training courses.

At the national level, these include the Lal Bahadur Shastri National Academy of Administration, the Administrative Staff College of India, and the Institute of Advanced Studies.

Most state governments have set up academies/ institutes for induction training for state public service commission staff, as well as in-service training for various levels of administrative staff including the IAS. Some of these have environment related courses. The Yeshwantrao Chavan Academy of Development Administration (YASHADA), Maharashtra has set up a Centre of Environment and Development, specifically for environment related courses. This Centre is also facilitating the integration of environmental concerns in good governance and district planning related initiatives in the state.

The Ministry of Environment and Forests supports the Indira Gandhi National Forest Academy for induction and in-service training for the IFS; the Indian Council of Forest Research and Education to organize, direct and manage research and education in forestry sector; the Indian Institute of Forest Management for developing managerial human power and development of managerial capacity in the forestry and allied sectors; the Wildlife Institute of India for training wildlife managers in specific aspects of protected area and wildlife management. The Directorate of Forest Education, MoEF is responsible for controlling, coordinating and managing all regular training courses of State Forest Service and Forest Range Officers in the country.

There are over a 100 institutes in India, involved in rural development related training in India. These include the National Institute of Rural Development and the State Institutes of Rural Development, as well as NGOs, university departments and other academic institutions.

The National Institute of Urban Affairs (NIUA) is a premier institute for research, training and information dissemination in urban development and management. NIUA conducts a variety of urban management related training programmes including management of urban environment.

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**Environmental Economics programme**

As a part of the India Environmental Management Capacity Building Technical Assistance Project (IEMCB) that is being implemented by the Ministry of Environment & Forests, Government of India, Environmental Economics is one of the foci. The objective of this programme is to increase the capacity for the application of economic principles and tools to environmental management in India across the full range of issues such as priority-setting, cost-benefit analysis of alternative policies for pollution control, resource management and biodiversity conservation.

Training programmes are open to officials of the Government of India (both central and state and public sector undertakings), managers in Industry and financial institutions, voluntary organisations, media persons and other concerned citizens. The MoEF also has a plan to establish the 'Environmental Economics Indicators and Policy Planning Cell' at the Ministry. Some core institutions have been identified for carrying the tasks within this cell. These are Madras School of Economics as the executing agency; Institute of Economic Growth; Indira Gandhi Institute of Development Research; The Indian Statistical Institute.

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There is a need to assess and strengthen the biodiversity related content in induction and in-service training programmes for the administrative, civil and forest services, and those who are placed in local level developmental planning and execution in both urban and rural areas.

| Desired actions | Priority | Time frame | Key players |
|---|---|---|---|
| *Strengthening biodiversity-related training for administrators*<br>1. Incorporate induction and in-service modules on biodiversity related issues, including environmental economics in all national and state administrative training academies. For this, working groups must be set up by Department of Personnel and Training, GOI and other state training mechanisms to review syllabi of long and short duration courses, and especially foundation courses for biodiversity and environment content.<br>2. Special locale and need specific courses / modules and related material and training methodologies should then be worked out.<br>3. Initiate regular faculties / departments of environment in the national and state training institutions. Use YASHADA experience for this. | 1 | 2 years | Dept of Personnel and Training, all State Training Academies, MoEF.<br><br>Working groups should consist of academics, NGOs, administrators |

| | | | |
|---|---|---|---|
| *Strengthening biodiversity-related training for Forest management staff* <br> 1. MoEF should set up a process and consultative group drawing upon national institutes and individuals involved in NBSAP to develop outlines for induction and foundation training level modules for IFS and all other levels of forest department personnel. <br> 2. Based on these outlines, a variety of material suitable for these courses, as well as effective methodologies need to be worked out by the training institutes, EE agencies. <br> 3. Maximum concentration of training on biodiversity issues needs to be given to front-line staff. <br> 4. Develop mechanism for continued capacity building. <br> 5. Arrange training programmes and refresher courses for protected area staff on new and emerging aspects of biodiversity use and conservation (Terrestrial Ecosystems SAP) | 1 | 2 years | MoEF, WII, IIFM, ICFRE, FRI, and other institutions, including NGOs. |
| *Strengthening biodiversity-related training for urban managers and planners* <br> 1. Training for urban managers and planners needs to include content (with case studies and examples) on understanding of biodiversity conservation in urban areas, identifying and mapping biodiversity rich areas and planning for minimizing impact of urbanization on biodiversity, use of biodiversity resources by urban populations, conservation / ecorestoration of biodiversity rich habitats, preparation, publication and use of Environmental Status Reports. <br> 2. Institute short-duration effective training programmes on the above for urban planners, through NIUA, All India Institute of Local Self Government, the state administration academies, and several other institutions. <br> 3. Set up a mechanism at state level to ensure that staff of municipal authorities undergo such training. | **1** | **2 years** | NIUA, AIILSG, CEPT, NGOs working on biodiversity issues in urban areas. |

# Industry

As a sector that has major impacts on, and dependence on, biodiversity, it is critical to create greater sensitivity in it towards conservation, sustainable use, and equity issues.

The Environment Management Division of the Confederation of Indian Industry (CII) helps build in-house capabilities in Indian industry to address environmental issues effectively and pro-actively. This is done through seminars, workshops and training programmes.

The National Institute of Small Industry Extension Training (an organization of the Ministry of Small Scale Industries, Government of India) and the Small Industries Development Bank of India (SIDBI) capacity build small-scale industries in environmental issues and assist them in finding solutions for treatment and remediation.

These efforts are not enough. There is a need to move away from end-of-pipe treatment.

The processes of extraction of resources, siting of industry, and EIA requirements need to be assessed and reworked to integrate biodiversity and livelihood concerns.

| Desired Actions | Priority | Timeframe | Key players |
|---|---|---|---|
| • Document information on waste minimization; optimization of resource use; environmental impact with a bearing on resource quality; resilience of ecosystems; handling of hazardous wastes<br>• Foster greater networking and information servicing.<br>• Develop comprehensive local databases to help integrate 'production' and 'protection'.<br>• Facilitate financing for cleaner production and waste minimization to small scale industry<br>• Train EIA consultants in biodiversity concerns | | | Ministry of Industries, FICCI, CII, SIDBI, EIA cell of MoEF, Sector wise industrial associations, Regional Development Boards |

# Specific Occupational and Professional Groups

**Armed Forces**
The defence services have several advantages as a sector that can play a role in environmental conservation, including
- A large human resource (of in-service personnel (about 15 lakh people all the services put together), and of ex-service people.
- The human resource has a diversity of background, and a geographical spread that has presence in and access to environmentally significant and fragile areas, unapproachable by other groups.
- Large tracts of land, which contain significant biodiversity rich areas.

Some of the existing or ongoing environmental initiatives include:
- Some of the cantonments, and divisions have already been playing an environment role. Some areas are declared plastic free such as INS Shivaji in Lonalvla, College of Military Engineering, Pune.
- There also ex-servicemen leading by example, such as Shri Anna Hazare.
- There are Ecological Task Forces – of ex-servicemen doing plantations for more than 15 years in 5 states

Concerns
- There is a need to enhance the environmental role of the armed forces.
- This will require more avenues for training of armed forces staff, and for creating new partnerships with NGOs and citizens groups.
- They also have a role to play in CITES. There is a need to integrate CITES related information in training programmes, as well concerns of not doing *shikar.*

| Desired actions | | | |
|---|---|---|---|
| 1. Set up a joint services programme to evolve programmatic inputs, including required capacity building, in the following areas:<br>  - Forestry- JFM like initiative with communities, NGOs and govt.<br>  - Watershed Development- in desert and hilly areas<br>  - Wildlife conservation- in deep forests and border terrains<br>  - Conservation activities at mountains<br>2. Identify space for training and capacity building programmes, and work with specific agencies to develop these. These may include special side courses at training level for JCOs and other officers, inputs during monthly 'Sainik Sammelan', evening roll calls etc.<br>3. Enhance role of ex-servicemen, by 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 livelihood related training for e.g. organic farming, composting, water management etc.<br>4. Partnerships need to be built with state governments, other organizations, and most significantly with communities for this. | | | Ministry of Defence working with identified agencies of MoEF. |

**Media**

| Enhancing mass media coverage of biodiversity | Priority | Timeframe | Key players |
|---|---|---|---|
| Conduct consultations with media owners and managers and impress upon them to give more space and time to environmental issues, particularly to biodiversity. | 1 | 1 year | PII, Centre for Media studies, CEE |
| 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. | 2 | 2 years | MoEF, CMS, CEE |
| Conduct training workshops for working journalists and freelancers on issues related to environment and ecology, with special attention on the biodiversity of the country. With a combination of lectures and field visits, the purpose of the workshops should be to familiarize journalists with some of the key aspects of biodiversity and help equip them with the right kind of contextual background on important topics related to biodiversity. The field visits, in | 1 | 1 year and ongoing | Press Institute of India, state press academies, MoEF, NGOs University depts of journalism and |

| | | | |
|---|---|---|---|
| particular, could be used to acquaint journalists with the tremendous amount of indigenous knowledge that exists among people at the grassroots and to develop a healthy respect towards these knowledge-holders. | | | communication |
| Create easily accessible databases on the subject matter of biodiversity, so that reporters and freelancers attempting to highlight any aspect of biodiversity would be able to provide detailed information and verify the claims made by various stakeholders. | 1 | 1 year and ongoing | CEE ?? |
| Institute short-term scholarships and fellowships for not only working journalists and freelancers, but also for journalism and communication students to encourage them to work in a focused manner on reporting issues related to biodiversity or to make television documentaries on the subject. | 1 | 1 year and ongoing | CEE ?? |
| (Source Media Sub theme) | | | |

## Judiciary

| | | | |
|---|---|---|---|
| The Judiciary may need assistance to effectively interpret environmental legislations. The judiciary should also be prepared for providing expert legal environmental assistance to expedite sustainable solutions that address competing interests. The following may help in this regard: 1. Assess existing orientation/ training programmes and reorient these to include biodiversity concerns. 2. Prepare a directory of experts and practitioners of environmental law. 3. Prepare and widely disseminate information about compilations of cases pertinent to environmental law among potential users, perhaps on a special website devoted to this. 4. Arrange orientation for judges and lawyers. | 2 | 5 years | NLSIU, WWF Centre for Environmental Law, Bar Council of India, ENVIS node for Environmental Law. |

**Financial institutions**

| | | | |
|---|---|---|---|
| Assess and include course content on environment, environmental impacts of possible projects, procedures for impact assessments, and overall understanding of sustainable development in in-service and induction orientation to staff of financial institutions, especially industrial and rural development banks, institutions supporting micro credit. Use learnings from initiatives such as the A P District Poverty Initiatives Programme in formulating such orientation.<br><br>There is a ? from AK about why not large projects – checked the IDBI site, they did not have any EIA requirement, only financial eligibility was there. So there is a policy change issue involved here. Can this be a task for EAT? The SIDBI on the other hand does have an initiative called Green Profits, and training for SSIs to be env sound. | **1** | **2 years** | IDBI, SIDBI, NABARD<br><br>CEE Industries Initiative |

**Other professional training**

| | | | |
|---|---|---|---|
| Training institutes for other govt. services also, such as for Engineering, Medical, Audit, etc. should set up mechanisms for assessing and integrating biodiversity concerns into their training programmes. The respective SAPs under the NBSAP mechanism should be accessed for this. | **2** | **4 years** | |

# Groups with special needs [11]

" I particularly enjoyed talking to pupils from the School for the Blind, because of the lively interest they showed, and I never ceased to marvel at their almost magical aptitude for grasping anatomical details merely by passing their fingers over the exhibits of skulls and bones specially prepared for them." Salim Ali said describing his experiences of conducting nature education sessions for pupils from the School for the Blind at Mumbai.

The reality today is that people with disabilities are largely left out from most mainstream activities and programmes, which include the opportunities to partake in environmental education programmes.

It appears that while people with disabilities are largely excluded from environmental education programmes, the situation is beginning to change, given the fact that over the last decade awareness regarding disability issues has grown. An analysis of the responses to the questionnaires received yielded the following information with respect to the involvement of people with disabilities in environmental education programmes: children with orthopaedic, mental, multiple, visual and hearing disabilities have been involved to some extent in activities like birdwatching, nature camps, outdoor adventure skills, audio visual programmes and vermicomposting.

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[11] This section has been developed by Sujata Padmanabhan, Kalpavriksh, Pune

Organisations working in the field of disability have planned environmental inputs themselves, often linked to the classroom syllabus, and have not involved environmental educators for any kind of inputs. This has often led to the inputs not being given in a sustained manner, and also with inadequate technical knowledge of the subject, and inadequate teaching material.

*A question of Rights*

"Active participation in the community" or inclusion, is indeed the biggest challenge for people with disabilities today. Society is almost completely designed for able-bodied living, and such an environment becomes "disabling" for people who have impairment. To illustrate this with an example: it would be impossible for a person with total visual loss to read this paper without the help of a sighted person. In this case, blindness, the physical impairment, has led to a disabling situation due to the paper not having been produced in Braille, or being recorded on tape.

Article 23 of the UN Convention on the Rights of the Child, 1989, (which India has ratified) states that "State Parties recognise that mentally or physically disabled children should enjoy a full and decent life in conditions which ensure dignity, promote self reliance and facilitate the child's active participation in the community."

The situation in India with regard to awareness about disability rights has seen some positive changes over the last decade. Disabled rights groups have been formed in a number of cities all over the country, and people with disabilities have increasingly been voicing their protests over exclusionary practices and also fighting for their rights. As a result a group that was largely invisible in society, or was visible mainly as an object of ridicule or pity (particularly in our urban metropolitan cities), is slowly being given opportunities to partake in society. Though much change still needs to be effected, most of all an attitudinal change towards a section of society that is perceived as "different", a beginning has surely been made towards inclusion.

"The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995" came into force in the year 1996. This law is an important landmark and is a significant step in the direction of ensuring equal opportunities for people with disabilities and their full participation in nation building. The Act provides for both preventive and promotional aspects of rehabilitation like education, employment and vocational training, job reservation, research and manpower development, creation of barrier-free environment, etc.

**Why should people with disabilities be included in environmental education programmes?**
There are an estimated 70 million people with disabilities in India, and as an integral part of society they too must be made aware of their responsibilities towards conservation. If environmental education aims to foster the values, attitudes and skills required to protect and improve the environment, then it is crucial that people with disabilities are also included. They too must be seen as consumers of natural resources, who have as much of an impact on the environment as any other group.

There are other reasons:

*People with Disabilities as possible spokespersons for conservation issues*
Many people with disabilities have made a significant contribution to the field of disability, not only by initiating rehabilitation services, but also helping to raise awareness about disability issues and campaigning for disability rights. The very fact that they have been discriminated against often results in their being able to relate to other social issues, sometimes in ways that reveal more sensitivity. The possibility of developing people with disabilities as environmental spokespersons by sensitizing them to conservation issues has not been adequately explored. Interestingly, out of the responses to the questionnaires, two persons have said that they feel that people with disabilities do articulate their views strongly.

The story of Caroline Casey clearly illustrates the above conviction. Caroline, a visually imparied woman from Ireland, traveled on an elephant through the states of Kerala, Karnataka and  Tamil Nadu from January- May 2001. She did this in order to raise funds for the Sight Savers Project (to support operations that would restore sight to people), and for projects that work for the conservation of the Asian elephant. The degree of Caroline's visual impairment is such that in Ireland she is registered as legally blind. The 1000 Kms. that she traversed enabled her to raise 250,000 pounds.

Caroline had set up the Aisling Project Charity, as an inspirational, adventurous  fund-raising initiative for the National Council for the Blind, Sight Savers International and for the protection of the Asian Elephant. In her words, "My wish for the Indian Challenge was to create an adventure and inspire people into thinking of disability in a positive way. I wanted to help open people's eyes. The journey was about saying, 'We all can make a difference', proving the positivity of alternative ability in the workforce and in society." (www.the aislingproject.org)

*A chance to contribute*
It is important for people with disabilities to be able to have a chance to contribute to their neighbourhood or community. This sounds like a trite thing to say, but the power of  contribution could be highlighted through two very interesting examples:

Vidyasagar is an organisation that works with people with disabilities in Chennai. Since  1997, children from their school project, many of whom have a neurological disability and use wheelchairs, have joined in Chennai's annual turtle walks. These walks are organised during the turtle nesting season every year, by the Students Sea Turtle Conservation Network, as an attempt to protect the nesting sites and eggs of the endangered Olive Ridley sea turtle. A group walks a five kilometer stretch of beach at night looking for the eggs which are taken to a hatchery. Over the last five years, over 50 children from Vidyasagar have participated. On every trip four children who use wheel chairs are a part of the group from Vidyasagar.  In fact the severity of the disability has not been an issue at all, according to the staff of the organisation. Nor has the time of the walks or maneuvering the wheelchairs over beach sands been a deterrent! Interestingly, some of the children have become regulars on these walks, and two students continue this involvement even though they are now no longer on Vidyasagar's rolls.

The second example is from the Spastics Society of Northern India (SSNI), New Delhi. The students of SSNI lent their support to the Narmada Project affected people in a small way. They had been exposed to the issues around large dams as part of a classroom project. It so happened that in the early 90s, people to be displaced from some villages in Maharashtra had organised a *dharna* in Delhi at Rajghat. The families had lost the precious little that they owned as the rising waters of the river had submerged their huts. Some of the students visited the *dharna* site with relief material that they had collected, where they had the opportunity to meet Baba Amte. Issues like submergence, displacement, loss of livelihoods, hitherto alien to these students, were brought up in a lively discussion with the villagers. To quote a few lines about the interaction from a special newsletter of the organisation, "When we were ready to leave some of the villagers thanked us warmly for our support. They said that even though they had lost all their possessions, they felt that being able to walk without difficulty was a blessing that they still had. As we left in our van, Mithun echoed the feelings of the group when he said, 'I may be disabled but at least my home has not been washed away.' Solace, but at what a price!"

*A chance to earn*
Almost all the respondents to the questionnaire have stated that people with disability could earn a livelihood through conservation/environment related jobs, and though some have stated that this is an area that they have not given much thought to, others have suggested options like gardening or working in nurseries, and  vermiculture. The Association for People with Disabilities, Bangalore, has been running a

horticulture training programme for people with disabilities with the basic objective to create employment for youth with disabilities. Around 25 youth are trained every year, after which most find employment.

Jana Pada Seva Trust, which is based in Melkote, a temple town in Mandya district in Karnataka, has been running an integrated school for several years. A number of children with disability from surrounding villages study in the school which offers residential facilities. The trust also has a large farm where a number of crops and fruit trees are grown organically. Children with disabilities were included in many of the activities on the farm, an activity that they enjoyed greatly.

Tasks that are a part of gardening or working in nurseries are so diverse that a match could be made to the abilities of people with disabilities. The nature of the tasks itself could incorporate physical therapeutic exercises (stretching, reaching, etc), and facilitate transfer of skills into other life situations (e.g. filling water cans up to a certain level). Also the activity of tending to plants is a low stress activity which could be therapeutic for disabled people whose life circumstances are sometimes very stressful.

## Hurdles faced

Respondents to the questionnaires were asked what they considered to be the main hurdles that have prevented inclusion of people with disabilities in environmental education programmes. The responses elicited could be grouped under the following three main categories:

### *A feeling of inadequacy on the part of environmental educators*

Environmental educators mentioned feeling a lack of specialised training to be able to deal with people with disabilities. Feelings of inadequacy (or discomfort or fear) could be put down to many reasons: lack of opportunities to interact with persons with disabilities because they are not yet part of mainstream society; persons with disabilities are sometimes perceived as "different" because they do not fit into what society by and large defines as the "norm" for behaviour; the establishment of specialized institutions for rehabilitation services has created and reinforced a special aura or mystery about disability.

Such diffidence leads to the misconception that any programme that involves people with disabilities has to be specially designed, specially executed with different methodologies, special materials, activities etc. While there is an element of truth in this in as much as say an outdoor activity may have to be designed for wheelchair users, or a story made available in non-visual modes to people with visual impairment, the focus should definitely be on using existing environmental education programmes. All that is required is sensitivity to some special needs that a group may have, and a realisation that there is often a very thin dividing line between ability and disability.

### *A lack of expertise*

While environmental educators mentioned feelings of inadequacy as a hurdle, people working in the field of disability stated that a lack of knowledge on environmental issues prevented them from carrying out any sustained programme. What was also mentioned was the inability to sometimes know what to focus on (since one is dealing with very vast subjects) and also how to keep up continuity for a specific group.

### *Issues of access*

As mentioned earlier, access is a major issue for crutch, walker and wheelchair users. Most public places of nature education have physical barriers that bar entry to these users, like a flight of steps or a turnstile entrance. Consider the parks, zoos and the museums of our cities and one would realise that in their planning and design, the needs of disabled individuals were not considered. Even if the entrance barriers are overcome, there are always more to contend with: cobbled pathways in parks; sign or information boards which persons with visual impairment cannot read easily; exhibits in museums which are far

above the eye level of a wheelchair user, to mention just a few. Even programmes organised for the general public are not without barriers to information. A leading environmental group in Pune discovered this, when a young participant complained that she could no longer lip-read during a public lecture when the lights were switched off for a slide show.

The Persons with Disabilities (Equal Opportunities, Full Participation and Protection of Rights ) Act, 1995, provides that the appropriate government and the local authorities shall, within the limits of their economic capacity and development, provide for ramps in public buildings. Increasingly, groups of disabled activists in some cities are beginning to realise the need for strong advocacy of their needs, and have been  catalysts for many initiatives: spreading awareness on disability issues to key target groups like architects, city planners, etc; focussing energies on a certain public building (s), to ensure the modifications are made to enable access. However, at times the challenges are great. For example, if a ramp has to be built, the gradient of the slope has to be such that it is possible to negotiate a wheelchair up. The length of the ramp has to be in a certain ratio to the degree of the height of the slope. In already existing buildings this could become a challenge, as the existing space may be inadequate.

In Bhopal the efforts of a group, Arushi, have been significant. They networked with officials of the Regional Museum of Natural History for making it  disabled-friendly. To make information regarding the center available to the visually impaired they  transcribed brochures and other information regarding the center into Braille. In collaboration with the Regional Museum of Natural History, Arushi also organized one day workshops on Accessibility for the staff of all museums, parks and zoos of Bhopal.

While efforts like those of Arushi must be promoted, it is equally important to focus on access to public places that are yet to be built. In this connection it is interesting to note that the Central Zoo Authority (CZA), (which was created in 1992 under Section 38 of the Wildlife (Protection) Act), became a regulatory body for the enforcement of mandatory standards and norms for the management of zoos. The National Zoo Policy 1998, states in its section on Amenities to visitors that "Ramps shall also be provided for the benefit of visitors in wheel chairs for approach to animal enclosure and other civic amenities." One needs to gauge to what extent such rules and policies actually make a difference on the ground.

**Facilitating Inclusion**
An overarching strategy to facilitate inclusion of people with disabilities into ongoing environmental education programmes is **collaboration**  between groups working in the two fields. Collaboration between the groups would help in many ways:

*Awareness raising and sensitization:*
Networking between groups working on environment and disability would help raise awareness about environment and disability issues. While certain issues are clearly a concern of both the groups, like for example the recent shocking links being made between endosulphan spraying of cashew plantations in Kasargode district in Kerala and the increase in incidence of neurological disabilities, there are certain others which are not so apparent. To state one example, the guidelines brought out by the Ministry of Urban Development for greening of urban areas and landscaping includes "tiling to be done only on pavements with heavy pedestrian traffic." While the reasons for this are clearly to be able to allow roadside trees sufficient root aeration, it could make mobility more difficult for wheelchair users. Obviously, for such issues the best solutions would emerge from a dialogue between groups/ministries that view issues from very different perspectives.

While there is a definite need for awareness raising and sensitization on issues related to disability amongst the general public, certain key groups like teachers, education departments, and national and state level institutions like the NCERT and the SCERTs, would be crucial in facilitating inclusion. Where

children with disabilities are concerned, the current thrust is for inclusive education, where efforts are being directed to facilitate the education of children with special needs in regular classrooms. Hence, it is hoped that in the years to come children with disabilities would be part of regular schools, and that interventions aimed at involving able bodied children in environment education programmes, would also include them.

*Orientation/training programmes:*
While raising awareness is crucial, it is equally important to build capacities of groups through orientation and training programmes. On a national level this needs to happen through schemes like the National Green Corps, an ambitious programme initiated by the Ministry of Environment and Forests, which includes starting of Eco-clubs in 55,000 schools (a hundred schools in each district) across the country, conducting teacher training programmes, and developing locally relevant resource material for conducting the activities of the Eco-clubs. Schools for disabled children need to be included in the programme, and special educators included in the capacity building training for environmental education.

At the same time, much ground could be covered by including a component on disability and environment in the BEd. course syllabus. This would reach out to a large workforce of teachers, who would then already be sensitized to the needs of disabled children, to be able to effectively include them in environmental education programmes that they may initiate.

*Developing and sharing of resources:*
If collaboration does lead to an increased awareness and sensitization of the needs of special groups, then developing/ modifying educational material, games, activities for people with disabilities would be facilitated.

At the request of a school for visually disabled children at Ahmedabad, Centre for Environment Education (CEE), collaborated with Abilities, a resource centre for disability, to produce an entire package in Braille called "Jungle Tracks". It contains a set of jungle lore, rhymes and riddles and an activity book in Braille, as well as an audio tape of the stories. CEE has also developed touch and feel models of birds, a tape of bird sounds and a booklet on birds in Braille.

*Linking to ongoing programmes/schemes:*
As mentioned earlier, programmes initiated at the national level like the National Green Corps should include persons with disabilities within their mandate. Other schemes like the National Environmental Awareness Campaign (NEAC) of the Ministry of Environment and Forests, should also be made available to groups working in the field of disability. This could be done by widely disseminating information about such schemes to groups who would otherwise be excluded. An even greater impact would be achieved if this is declared as a focal subject or theme of the NEAC for one year.

At a local level, groups who are involved in environmental education programmes need to extend their expertise to groups working in the field of disability. Environmental education groups run nature clubs, organise outdoor camps and field visits, initiate community level programmes or campaigns (for example, clean up drives or anti plastic campaigns), hold seminars etc. They need to make special efforts to involve groups that are not mainstream.

## Conclusion

In conclusion, the philosophy of inclusion is one that will allow for people with disabilities to partake as equal citizens in society. The barriers that are the most challenging to overcome are those that are attitudinal in nature that see disabled people as different. The very fact that the head of a very well known environment organization remarked that people with disabilities have "enough problems of their own to be able to worry about the environment" speaks volumes of the miles that still have to be traversed in the efforts to make our society an enabling one.