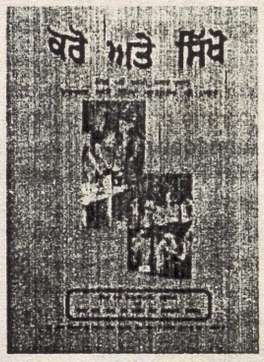
TWG Edu. 547/Them DOC/Draft Action plan/CEE vol 6, 2003

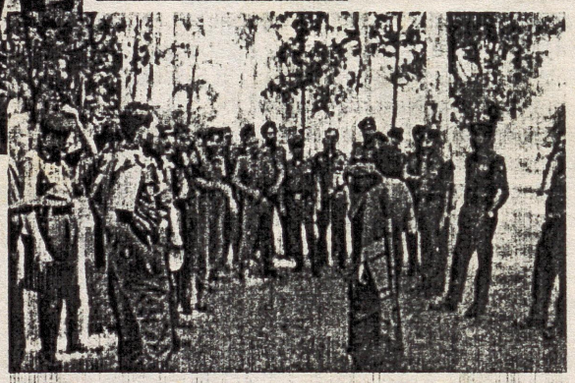
Biodiversity Education, Awareness and Training Strategy and Action Plan

Prepared under the
National Biodiversity Strategy and Action Plan-India













CEE

Centre for Environment Education

2003

NBSAP Executing Agency: Ministry of Environment and Forests, Government of India
NBSAP Funding Agency: United National Development Programme (UNDP)/Global Environment Facility
NBSAP Technical Implementing Agency: Technical and Policy Core Group (TPCG) coordinated by Kalapvriksh
NBSAP Administrative Agency: Biotech Consortium India Ltd.

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Abbreviations

AICTE	All India Council for Technical Education
BGVS	Bharat Gyan Vigyan Samiti
BRT	Biligiri Rangaswamy Temple Sanctuary
BSI	Botanical Survey of India
BVIEER	Bharati Vidyapeeth Institute of Environment Education and Research
CBO	Community Based Organisation
CBR	Community Biodiversity Register
CEE	Centre for Environment Education
CERC	Consumer Education and Research Centre
CII	Confederation of Indian Industry
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
COP	Conference of Parties
CPR EEC	C P Ramaswamy Aiyar Environment Education Centre
CZA	Central Zoo Authority
CZA	Central Zoo Authority
DIET	District Institute of Education and Training
EAT	Education, Awareness and Training
EE	Environmental education
EESS	Environmental Education in the School System
EGS	Education Guarantee Scheme
EIA	Environment Impact Assessment
EMRC	Electronic Media Research Centre
ENVIS	Environmental Information System
EOSE	(Scheme for) Environmental Orientation to School Education
EQM	Environmental Quality Monitoring
FICCI	Federation of Indian Chambers of Commerce and Industry
FSI	Fisheries Survey of India
FSI	Forest Survey of India
FTII	Film and Television Institute of India
GEF	Global Environment Facility
ICAR	Indian Council of Agricultural Research
IEMCBTAP	India Environment Management Capacity Building Technical Assistance Project
IITM	Indian Institute of Tourism Management
IPR	Intellectual Property Rights
JFM	Joint Forest Management
KVK	Krishi Vigyan Kendra
LBSNAA	Lal Bahadur Shastri National Academy of Administration
MHRD	Ministry of Human Resource Development
MoEF	Ministry of Environment and Forests
NABARD	National Bank of Agricultural and Rural Development
NCAS	National Centre for Advocacy Studies
NCERT	National Council of Education Research Training
NCTE	National Council of Teacher Education
NEAC	National Environment Awareness Campaign
NEEPS	National Environment Education Programme for Schools
NGO	Non governmental organisation
NIEPA	National Institute of Educational Planning and Administration
NIF	National Innovation Foundation
NIUA	National Institute of Urban Affairs
NLSIU	National Law School of India University
NMNH	National Museum of Natural History
PA	Protected Area
PSSCIVE	Pandit Sundarlal Sharma Central Institute of Vocational Education
RANWA	Research and Action in Natural Wealth Administration
SACON	Salim Ali Centre for Ornithology and Natural History
SAP	Strategy and Action Plan
SCERT	State Council of Educational Research and Training
SGP	Small Grants Programme
TBGRI	Tropical Botanical Garden Research Institute
TERI	Tata Energy Research Institute
TPCG	Technical and Policy Core Group
TRI	Tribal Research Institute
TWG	Thematic Working Group
UGC	University Grants Commission
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
VGKK	Vivekananada Girijan Kalyan Kendra
WII	Wildlife Institute of India
WRI	World Resources Institute
WWF	World Wide Fund for Nature
ZSI	Zoological Survey of India

Thematic Concept Note:

EDUCATION, RESEARCH AND TRAINING

NOTE: Please note that there is a suggestion that Research should be dealt with separately and not clubbed with Education and Training. With this in mind, there are two separate sections below. A decision on this needs to be taken.

RESEARCH

India has an extensive network of research institutions and a very large amount of activity, in various aspects of biodiversity. However, research still suffers from the following problems:

- It is still seriously inadequate on many aspects of biodiversity;
- Even where it does exist, there are problems in making it applicable to ground situations, i.e. the linkage between research and practice is not very strong;
- Similarly, there are gaps in making the research results available to the concerned and interested public;
- There is a serious lack of linkages between community-level knowledge and informal research on the one hand, and formal research systems on the other;
- There are formidable problems of monitoring and judging reliability and quality of the research going on.

Given the above, this Working Group should:

- Assess the current levels, scope, and effect of ongoing research work on various aspects of biodiversity;
- Identify the kinds of existing institutions, expertise, and experience in biodiversity related research;
- Explore long-term benefits of investments by the corporate sector in R&D and in conservation/sustainable use related activities.
- Identify critical gaps in ongoing research and its application: what fields and aspects are inadequately researched, what gaps exist in the links between research and application, what deficiencies exist in disseminating research results; and what gaps exist in linking informal and formal systems of research;
- List the key measures needed to plug the above gaps;
- Assess the importance of research for the validation or testing of beliefs and priorities;
- Design effective mechanisms for engaging knowledgeable women & men of communities inhabiting biodiversity rich areas in participatory community based research both for validating rich indigenous knowledge and enriching research outcomes.
- Prioritise the research actions needed in terms of their importance and immediacy;
- Identify the resources (human, institutional, and economic) that are necessary to undertake these steps.

The WG might want to consider some specific case studies to analyse the impact research has had on conservation and other aspects of biodiversity.

EDUCATION AND TRAINING

There is a considerable amount of activity in India in the fields of education, awareness spreading, and training, with regard to various aspects of biodiversity. However, there remain critical deficiencies, such as:

- value equally the contributions of all with whom we work and associate
- aim to create a nurturing atmosphere, appreciating the importance of each others needs and constraints and encouraging each others growth through open, honest and sensitive communication
- resolve conflict through caring, understanding and direct discussions
- practice and promote participative and consultative decision-making in every sphere of work and among all those who contribute in any way to achieving our mission
- strive for the highest professional and personal standards, working without personal publicity and thinking critically, analytically and with openness about all aspects of our work
- use our limited resources cost-effectively, applying both qualitative and quantitative measures
- are sensitive to social, environmental, gender and rights issues and pursue social justice without fear
- maintain the highest ethical standards in all our dealings

Why a strategic plan?

The plan will provide us with a clear direction over the five years between 2000 to 2005, the strategic objectives creating a framework around which policies and practices will be developed. It is the first such plan we have produced and will be the result of wide consultation among individuals and groups with a direct or indirect interest in our progress.

What is the rationale behind our strategic objectives?

Our expansion and professional growth has had two consequences:

- our understanding of rehabilitation and the needs of the disabled, their families and caregivers has increased and we are becoming more community-based and more of a promoter of indirect services through other organisations
- we have outgrown our existing management and financial structures

To meet these new challenges, move towards the completion of our mission and be a consistently high performing organisation, we have to:

- Poor out-reach to different sections and age groups of the general public with messages that they would relate to;
- Failure of standardised, urban-set programmes to be relevant to localised, gender differentiated and community/site-specific situations and priorities;
- Failure to learn from the educational practices of local communities and other parts of the 'informal' sector;
- Inadequate acceptance of 'non-formal' methods of awareness, education, and training;
- Poor integration of biodiversity concerns into formal curricula of educational and training institutions.

Given the above, the Working Group should:

- Identify the different audience/client groups requiring education, awareness and training programmes, and the specialised requirements of each audience; in particular, identify groups and sectors that have been poorly represented in past programmes;
- Identify, and assess, ongoing activities (formal, informal and community based) in this field (building on existing assessments);
- Identify the kinds of existing institutions, expertise, and experience in this field;
- Identify the critical gaps in this field, such as the infusion of biodiversity concerns into the formal curricula, or the orientation and training of specialised segments of society (lawyers, political leaders, development planners, corporate managers) that deal directly or indirectly with biodiversity;
- List measures needed to fill these gaps, including through site-specific, culturally sensitive methods, capacity-building, and focusing on hitherto neglected segments (political leaders, legal fraternity, and so on);
- Prioritise these measures in terms of their importance and immediacy;
- Identify the resources (institutional, human, and economic) needed to undertake these measures.

The WG might want to consider some specific case studies to analyse the impact environmental education has had in increasing awareness regarding biodiversity concerns. For example, it would be interesting to look at the impact of nature camps on their 'target' groups, or at the impact of media campaigns on increasing awareness about biodiversity, including high profile species like the tiger.

- redesign our programmes where necessary
- address the need for infrastructure adjustment and modification and build internal support functions
- ensure we have a solid foundation for the continuance of our current and future work

Our objectives are statements of what we will do to achieve this.

What are our strategic objectives?

Over the next five years we will:

- become a more efficient organisation
- develop systems and structures for sound financial management
- promote wider access to educational and vocational facilities, social integration and medical rehabilitation, focusing on people with multiple disabilities
- further our involvement in legislative, advocacy and awareness raising activities
- measure and enhance the impact of our work

What strategies will we use to achieve these objectives?

WE WILL BECOME A MORE EFFICIENT ORGANISATION BY:

- designing and implementing an organisational and management structure which
  - enables us to more effectively meet all our objectives
  - reinforces the working relationship between the governing body, management teams, programme staff and volunteers
  - increases the efficiency of decision-making processes
  - devolves decision-making and responsibilities
  - clarifies areas of accountability
  - includes participatory and consultative mechanisms
- developing and reviewing management systems which

No. 1(P)(i)

Seema's draft, modified by Ashish
18/2/2000

Thematic Working Group Concept Note:
EDUCATION, RESEARCH AND TRAINING

NOTE: Please note that Seema Bhatt feels that Research should be dealt with separately and not clubbed with Education and Training. With this in mind, she did separate notes on these. I have made some revisions to these. We need to take a decision on this issue of splitting up the Working Group.

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- It is still seriously inadequate on many aspects of biodiversity;
- Even where it does exist, there are problems in making it applicable to ground situations, i.e. the linkage between research and practice is not very strong;
- Similarly, there are gaps in making the research results available to the concerned and interested public;
- There is a serious lack of linkages between community-level knowledge and informal research on the one hand, and formal research systems on the other;
- There are formidable problems of monitoring and judging reliability and quality of the research going on.

Given the above, this Working Group should:

- Assess the current levels, scope, and effect of ongoing research work on various aspects of biodiversity;
- Identify the kinds of existing institutions, expertise, and experience in biodiversity related research;
- Identify critical gaps in ongoing research and its application: what fields and aspects are inadequately researched, what gaps exist in the links between research and application, what deficiencies exist in disseminating research results; and what gaps exist in linking informal and formal systems of research;
- List the key measures needed to plug the above gaps;
- Assess the importance of research for the validation or testing of beliefs and priorities;
- Prioritise the research actions needed in terms of their importance and immediacy;
- Identify the resources (human, institutional, and economic) that are necessary to undertake these steps.

The WG might want to consider some specific case studies to analyse the impact research has had on conservation and other aspects of biodiversity.

EDUCATION AND TRAINING

There is a considerable amount of activity in India in the fields of education, awareness spreading, and training, with regard to various aspects of biodiversity. However, there remain critical deficiencies, such as:

- Poor out-reach to the masses of general public with messages that they would relate to;
- Failure of standardised, urban-set programmes to be relevant to localised, site-specific situations;
- Failure to learn from the educational practices of local communities and other parts of the 'informal' sector;
- Inadequate acceptance of 'non-formal' methods of awareness, education, and training;
- Poor integration of biodiversity concerns into formal curricula of educational and training institutions.

Given the above, the Working Group should:

- Identify the critical importance of education, awareness and training programmes, and the need for a national policy/thrust on such programmes as related to biodiversity;
- Identify, and assess, ongoing activities (formal and informal) in this field (building on existing assessments);
- Identify the kinds of existing institutions, expertise, and experience in this field;
- Identify the critical gaps in this field, including in infusing biodiversity concerns into the formal curricula;
- List measures needed to fill these gaps, including through site-specific, culturally sensitive methods, capacity-building, and focusing on hetherto neglected sectors (political leaders, legal fraternity, and so on);
- Prioritise these measures in terms of their importance and immediacy;
- Identify the institutional, human, and economic resources needed to undertake these measures.

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7. Broad Themes for NBSAP Working Groups

(Note: these may broadly also be chapters of the SAPs, though there may be revisions along the way in the structure of the SAPs)

1. ~~Identification, authentication, and evaluation of biodiversity elements (taxonomy, registration, etc.)~~
2. Economics and valuation of biodiversity
3. Livelihoods, lifestyles, and biodiversity (including poverty, consumerism)
4. Culture (including religion) and biodiversity
5. Health and biodiversity (including foods, nutrition, medicines)
6. ~~Agricultural biodiversity conservation and use~~
7. Wild biodiversity (especially threatened and endemic species)
8. Natural ecosystems (separate Working Groups on each ecosystem?)
9. Micro-organism diversity
10. Policies, laws, and institutions (including integrated (cross-sectoral) planning)
11. Access, benefit-sharing, and IPRs
12. Education, training, awareness, and research
13. Technology and biodiversity

(**Qs**: Two themes are possibly cross-cutting, hence not mentioned in above list: people's participation; and international issues. Or is it necessary to deal with these separately???)

Specific Sub-themes for Individual Research/Writing Assignments
(only an indicative list, not exhaustive)

(**Note:** these could figure as boxes or small sections in the SAPs)

History of biodiversity conservation in India
Perceptions of a cross-section of society on biodiversity
Mining and biodiversity
Biosafety
Sustainable technologies
Community conserved areas and species
Community gene banks
Biodiversity-based enterprise
Plantations and biodiversity
Fisheries (traditional and modern) and biodiversity
Aquaculture and biodiversity
Biodiversity in the media
Biodiversity in EIA procedures
Sacred biodiversity elements (landscapes, species)
Natural dyes and biodiversity
Nomads and biodiversity
Urban biodiversity
Vanishing traditional crops
Vanishing traditional livestock breeds
Homestead biodiversity (e.g. home gardens)
Public Distribution System and biodiversity

No. 1 (P)(ii)

Final draft
22/2/2000

Thematic Concept Note:

EDUCATION, ~~RESEARCH~~ AWARENESS AND TRAINING

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Given the above, the Working Group should:

- Identify the kinds of sectors requiring education, awareness and training programmes, and the specialised requirements of each sector; in particular, identify sectors who have been poorly represented in past programmes;
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No 1 (f)(ii)

Final draft
22/2/2000

Thematic Working Group Concept Note:
EDUCATION, AWARNESS AND TRAINING

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E+plore long term benefits of investments by the corporate (Pvt+Pub) sector in R&D
Pt No 4 (Corp)
After 2

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Corporate (Pvt managers & Pub)

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1. Introduction

Background

The National Biodiversity Strategy and Action Plan (NBSAP), a project of the Union Ministry of Environment and Forests (MoEF) aims to produce a series of planning documents dealing with the conservation of India's biodiversity, sustainable use if its biological resources, and equity including in decisions regarding access to such resources and the benefits accruing from them. The project is funded by the Global Environment Facility through United Nations Development Programme (UNDP). A unique aspect of the project is that its technical execution is by a Technical and Policy Core Group (TPCG) being coordinated by an NGO Kalpavriksh and its administrative coordination is by Biotech Consortium India Ltd.

The NBSAP process has included extremely widespread consultation across the country and across all sectors of society, involving tens of thousands of people. It aims to produce not one national action plans, but 18 local (substrate) plans, 33 state and union territory plans, 10 ecoregional (interstate) plans, and 13 thematic plans. All these will coalesce into a national plan, but will also remain independent for implementation purposes. In addition, over 30 thematic papers have been commissioned on a variety of topics related to biodiversity.

Within this overall process, one of the thematic action plans is on Education, Awareness and Training (EAT), which has been drafted by a working groups (hereinafter referred to as the EATTWG) consisting of persons experienced in the field (see credits page).

The EATTWG met three times. (Dec 2000, Mar 2001, Aug 2001). The second TWG meeting was held as a workshop at Centre for Environment Education, with programme staff from CEE and other organizations as well as the TWG members, as participants.

Besides the inputs from the EATTWG meetings and workshop, 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. Reference to the Minutes and the BSAPs of other executing agencies in the NBSAP process (see annexure).
4. Inputs from parallel processes, linked to the NBSAP processes. These include the deliberation and outputs of 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. Inputs have also been drawn from online discussions, hosted by CEE at its website www.envirodebate.org
5. Feedback on the draft EATSAP, which was circulated for comments and discussions at several stages, and especially through a peer review process, in which the draft EATSAP was sent to all the ENVIS centres and nodes in September 2002.

About this document

This document reflects the strategies for EAT which have resulted from the various processes described above. Section 2 of this document 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, that identifies the sections of society which need to be addressed on priority basis and which stand to benefit in effecting the desired change.

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

This includes a section on Groups with Special Needs has been excerpted from the paper 'Environmental Education and Disabilities' by Sujata Padmanabhan, Kalpavriksh.

2. Challenges For Biodiversity Education in India

1. Conservation of biodiversity as a value or as an activity can only be viewed in the overall context 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 that is being sold under different names.

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

2. Specifically related to this aspect are development policies that undervalue biodiversity. Whether it is forestry programmes that use exotics for afforestation or agriculture policies that promote monoculture, they 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, economic 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 principles 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 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 realization that biodiversity conservation must involve various stakeholders. In a country like ours, where the lives of most people are closely linked with bio-resources, both as users and as traditional conservers of these resources, 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 participate effectively in conservation and management of resources.

4. The three points above underscore 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 take decisions that 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 confronting 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 teaching do not help the child to learn about what it can see and experience. In fact, real life experiences of the child are not recognized as valid, or taken cognizance of. Nor does the education system use the environment as a resource. For instance there have been examples of Master's level Botany students who cannot identify the trees around them, though if shown sections of cells under a microscope, they can. This leads the child to keep academics and real life in two compartments, and not relate the one to the other. This is inimical to the spirit of environmental education. There is an urgent need to close the loop and demonstrate the links of textbooks to real-life examples.

   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.

6. If we have to conserve our biodiversity, our education has to reemphasize 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.

   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 reawaken the sense of ownership of biodiversity among the people. For it is only this which will rekindle the traditional care and concern that communities gave to their resources and to the environment.

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

7. 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. But a major challenge 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.

   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 outside the purview of biodiversity education efforts, the following have been prioritized as most significant:

1. Public awareness
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.

Elements of a Successful EAT Strategy

It is important to look at conservation strategies used over the past few years in India and elsewhere, from a communications point of view, to analyze what has worked and what has not, and to identify the effective communication strategies, or elements. Some of these learnings are as follows:

a. In Project Tiger, the tiger was portrayed as a symbol of what is to be conserved - in order to protect the tiger, the whole habitat needs to be protected. Thus an icon or a single message, which is easily recognized or understood can form the fulcrum on which a deeper conservation action rests.

b. Today in India, within every sector, there are people who fully understand environmental concerns, and have evolved effective sustainable development practices for that sector. CEE's Industry Initiative has actively identified people from within the industry who have tried out cleaner production. Such individuals are key 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. Thus a good strategy is to identify 'lead' 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.

c. It is important to identify key entry points, which would effect systemic changes. For example, in the Environmental Education in the School System sub component of the India Environment Management Capacity Building project supported by the World Bank and being implemented by the ministry of environment and forests, textbooks are being 'greened', since textbooks are the key tool in the formal education system.

d. It is equally important to reach key groups. Any communication programme has to be targeted at a leverage point, by addressing whom there will be a change. For instance, recognizing the key role the legal system can play in conservation, the WWF-India, the National Law School of India University and others have programmes on environmental law.

e. The very diversity of our country poses a challenge: while an educational programme or material might work in one region in one set of circumstances, it would not be applicable in another. Also, no one group can develop educational material for all the different situations in India.

Therefore, a different concept of design needs to be explored, of providing flexibility in design of programmes and material. In essence, the challenge is to help our education system become flexible and adaptable enough so as to allow for a diversity of situations, approaches and content, and to equip the teacher to recognize this diversity as an opportunity for biodiversity education. Our education system recognizes and works on this principal –while NCERT develops textbooks centrally, the idea is not that states should adopt them as is. Rather, they are models that are adapted and used by various states. The need is to systemically build in the space for flexibility, and enable this adaptation, at various levels.

f. India is rich in terms of institutions and NGOs. The strengths of several agencies and institutions devoted to R&D activities in specific bio geographic zones/ areas (such as the GB Pant Institute of Himalayan Development in the Himalayan region, several regional research labs of the CSIR, regional stations of the ZSI and BSI, regional university departments, etc), as well as of NGOs, should be utilized in implementing the SAP. These institutions have vast experience of local/ regional problems and needs of the local communities. These agencies could be identified as nodal centres for development and execution of the education and awareness programmes in consultation with the national nodal agencies. For instance, the ENVIS of the Ministry of Environment and Forests recognizes this special expertise of various organizations, and networks about 85 organizations of different areas of specialization.

g. Resources for biodiversity education and communication are limited. The need therefore is to design programmes that have a multiplier effect and can therefore have greater reach and impact. For example, faced with a choice of starting a magazine or a news service, CEE chose to initiate an environmental news and features service. A magazine would have reached out to a few thousand subscribers, mostly the 'already converted'. The news and features service goes out to about 1000 newspapers, magazines and NGOs, and any piece appearing in any of these publications has a readership of at least 10 times this, and that too among the general public, who otherwise would not have gone out of their way to read something on the environment.

h. Partnerships utilizing complementary strengths of various organizations to avoid duplication of effort and network effectively for synergistic convergence of ideas. Given the size and diversity of the country and the enormous challenge of creating awareness to support biodiversity conservation, it is obvious that a handful of agencies cannot do the task by themselves. A wide network of agencies is needed. There is a need for various types of agencies to recognize each other's strengths and develop ways of working together. For instance, while NGOs may effectively pilot innovative models, they can really not scale up without the government. Similarly, a field level agency with excellent rapport with communities may need technical assistance from specialist academic institutions for taxonomy or regeneration. There have been many intersectoral partnership programmes in India—for example, the National Environment Awareness Campaign (NEAC) of the Ministry of Environment and Forests (MoEF), and the Scheme for Environmental Orientation to School Education (EOSE) of the Ministry of Human Resource Development (MHRD).

The saree provides an interesting analogy to designing a flexible and adaptable programme. The saree is a designed piece of clothing. Over the years very beautiful designs, patterns and textures have been printed and woven into the saree, and yet, several thousands of years of Indian history has not tried to stitch the saree. It is worn in many ways and fits all sizes. It is equally good for working, dressing up or sleeping in. The final effect is the combined effort of the person who designs the cloth and the person who wears it–of the designer and the user. This is a very different concept from that of designing, say, a well-stitched dress. This garment either fits or doesn't fit, and where it fits, leaves little scope for the wearer to be innovative in its use. Our educational designing has to be somewhat like the saree, more a tool than a finished product, a tool that comes alive in the hands of the teacher, its application being the combined effort of the designer and the user.

i. Using existing opportunities: India has a few hundred protected areas and zoos. It also has aquaria, botanical gardens, natural history museums, etc. All of these have tremendous potential for biodiversity education. Any educational input in these places is resource-efficient, as no special effort has to be made to gather an audience. Experiences of such initiatives in sites like the Kanha National Park have proven the impact of such interventions. Similarly, there are several other opportunities, like the national green corps programme of the ministry of environment and forests, etc., where biodiversity education can easily be integrated.

j. Capacity building of educators, communicators, and key multipliers: while education is increasingly being recognized as an important input in biodiversity conservation initiatives, there is not enough capacity in the country—whether within government or NGOs or CBOs—to effectively plan and carry out strategic educational interventions. There is a need to systematically develop a cadre of environmental educators who can work in various sectors. The placement records of the alumni of 'Training in environmental education', an annual 8 month programme organized by CEE, and the value the students have been able to add to their organizations, bears this out.

The Government Policy Cycle

Policy making is a cyclic process of four main stages:

1. Agenda setting or identification stage
2. Policy formation
3. Implementation
4. Management and control

Communication has a different significance and plays different roles in each the policy-making stages.

Identification phase

For any policy there is a period in which an issue has to be put on the agenda. NGOs, consumer groups, businesses, health groups, scientists, educators, international agencies all raise issues. These may be conflicting issues, which helps to broaden interest in the issue. The government may stimulate NGOs to play a role in this stage by providing the information or it may take a more active role itself in putting issues on the agenda. For the government, communication tools are used to listen and assess public opinion, and identify problems promptly and pin point specific issues affecting the target groups of environmental policy. At this stage, opinions are communicated, drawing attention to the issues and defining themes. The methods of communication are:

- regular opinion and attitude surveys
- analyzing mass media content
- management by speech - communicating the ideas to other departments, sectors
- systematic, continuous networking with NGOs, interest groups, scientific institutions (public relations)
- regular briefing, interviews and meetings with interest groups and the press to listen and stimulate issues.

Formulating environmental policy

Once the government decides it is an important issue, it starts a policy forming phase. Communication with other government sector that may be influenced by this policy is important, so is communication with people who will have to live with the effects of such a policy. A policy out of touch with reality will fail, as will one that no one knows about, At this stage activities raise awareness of environmental problems increase the public's understanding of the policy proposals and creates broad support for the issues. Communication is used to listen to stakeholders, monitor knowledge attitudes, and practices of target groups, and listen as well as tests ideas as a strategy or action plan is formed. The methods of communication are:

- knowledge/ attitude and practice surveys (KAP)
- integrating communication in the mix of policy instruments
- design of a communication strategy
- communication to and consultation with those who will be involved (public relations)

Implementing environmental policy

The aim at this stage is to communicate information about how to proceed. The idea is to communicate the substance of the policy and the accompanying measures. At this stage the communication is aimed mainly at specific target groups. Here government can use their combination of incentives, regulations, communication, marketing, awards, negotiations to have an effect on practice, and to encourage change. But all this has to be done in a mix which works with the different groups to whom it is directed, This strategy was to have been based on an understanding of the people. And the implementation depends on how well the networks, intermediaries, and different sectors of society play a role in implementing. Communication strategies can support other instruments, or can work as a single instrument where it is identified that they can be effective alone. The methods of communication are

- information campaigns
- specific information materials
- marketing and advertising
- instruction
- education
- consultation of target groups (public relations)

Management and control

Here communication is provided as a service to sustain newly adopted attitudes and behaviour. The aim is to provide information about the policy that is being pursued as well as feedback reactions to that policy. Communication may be in the form of an active service explaining complex legislation and regulations. It may also be used to announce modifications to policy instruments

Reference: Saeed, S., Goldstein, W., Shrestha, R. (1998) *Planning Environmental Education and Communication: Lessons from Asia*. IUCN Bangkok and Switzerland.

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 in the following pages

Public Awareness and Reaching out to Local Communities

Communities in rural and tribal areas

India has had a strong conservation tradition, with a diversity of practices and beliefs. The State would have to recognize that plurality of species is not independent of plurality of practices. There is a need to develop innovative and creative ways of sustaining, protecting and encouraging such conservation traditions, in the contemporary context.

A normal government scheme-like support or bureaucratic process may not work, because it requires a uniform system to be followed. For biodiversity conservation initiatives, the scheme needs to be an enabling scheme. While suggestions and guidelines may be given, the 'how to do it' must be designed according to local needs. Some new mechanisms will have to developed for the State to promote and support plurality of practices rather than enforce homogenous centralized norms.

The crisis for occupational groups and communities that depend directly on biodiversity, and indeed for the country, is not just of loss of biodiversity, but also of the loss of community knowledge associated with its use. Community knowledge is diverse – it is specific to ecosystems, communities, gender, generation and occupations. Different members of the community - healers, men, women, older and younger folk - have different roles, different learning environments and therefore different knowledge bases. 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.

Traditional practices that support biodiversity conservation need to be documented and published as popular books. This is with respect to documentation 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. The experiences of the Jan Vachan Andolan of the Bharat Gyan Vigyan Samiti is an example of how this can be done (see box).

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, biodiversity use, external threats, experiences of benefit sharing etc., and about how these are related to global, regional and national values of biodiversity.

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

"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 marginalized sections such as the landless, adivasis, dalits, and in particular women and children within them?"

Ashish Kothari, in note prepared for multi stakeholder consultation at Goa, organised by CEE for gathering inputs for preparation of the India WSSD document, Jan 2002

Local Health Traditions

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 this context, Anthra is training women as animal health care workers, to document and revive these traditions, and to help improve the livelihood options of the women.

- Nitya Ghotge, Anthra, pers com

Village Study Circles

There is a need to give as much importance to traditional modes of thought, knowledge systems and practices, as to formal education. 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 invited outside "experts" 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.
From *Educating for Diversity,* The Hindu Folio.

Honey Bee Network

The 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, vegetable dyes etc. The network also attempts to protect IPRs of the grassroots innovators and to share with innovators any benefits accrued from commercialization .
http://www.sristi.org/genesis.htm

For tribal and most rural communities, biodiversity is the basis of survival – for religion, culture, livelihood, health and economic activity. However, if maps of India showing areas of highest poverty, areas of tribal concentration and forest areas are overlaid, they show an incredible overlap. One way of reading this correlation is that the existence of 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 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 in 2000. Today they are exploring alternative development strategies. [1]

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

Besides JFM and ecodevelopment, recent years have seen promotion of Tourism and Ecotourism as income generating opportunities for forest based communities. 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. Most importantly, the management of ecotourism must vest in local communities.

Small projects for environmental awareness are supported by the Ministry of Environment and Forests through the National Environmental Awareness Campaign (NEAC). 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.

Mechanisms

1. Strengthening community knowledge
2. Enhancing 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, with management of the facilities vested with them.
7. Popularize technologies for sustainable development
8. Document and disseminate experiences of environmentally sound farming
9. Enhance the effectiveness of environmental public hearing.

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

Community 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 remaining households rely on harvesting non-timber forest produce or employment to sustain their livelihoods. The non-timber forest produce is 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 produce were established in 1994 as part of a project initiated by the Vivekananda Girijan Kalyan Kendra 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 households 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.

The key element of the effort is participatory resource monitoring. Its objectives are to continuously estimate production, extraction and regeneration levels of non-timber forest product species. It is organized at the *podu* 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 have also been prepared on participatory resource monitoring. A general manual describes its objectives 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 use by 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 too describes the objectives of resource monitoring and the parameters for which data should be recorded.

Source: Community Based Monitoring Sub theme draft SAP

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. 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 documentation of experiences and folk songs and stories as related by local communities. Some titles are translations of stories from other countries, and others are authored books. Typically a Jan Vachan team would visit a village, gather the people, and talk about local issues. The process of reading some of the relevant books would start. Sometimes, the concerns people expressed would form the content of the next book. The Jan Vachan books are meant for village libraries, people's homes, teachers, gram sevaks, and CBOs and NGOs.

Source: Personal communication with Vinod Raina, Nagamani Rao and Datta Desai.

Desired Actions

Priority: 1
Timeframe: 1 year to initiate; ongoing thereafter
Key players: MoEF to initiate a scheme for this.

1. Work with communities to strengthen community knowledge

Document, develop and widely disseminate popular District Biodiversity books/booklets using learnings from the Literacy Mission experience. These booklets would which document traditional knowledge of biodiversity. This must be done by/with local people, not just by outsiders, and should include:

a. traditional community systems of teaching, learning and training.
b. information, knowledge and understanding of agrobiodiversity that rests in rural communities and how it is affected by market forces
c. traditional home gardens, and the biodiversity therein[1] . *(see box on FRLHT Kitchen Herbal Garden Programme)*

The documentation should not only consist of descriptions of knowledge systems and their use, but also information on the threats to its survival.[2] Particular emphasis must be placed on practices recognizing environmental limits to sustainable exploitation of the resource. [3]

Priority: 1
Timeframe: 1 year to initiate
Key players: MoEF (especially the survey agencies), Centre for Ecological Sciences, colleges and NGOs involved in facilitating preparation of biodiversity registers, local communities who have experience of preparing CBRs, especially *vaidus*

2. Enhance biodiversity documentation

In the context of biodiversity registers, a mechanism needs to be evolved to link local barefoot taxonomists with scientists of BSI/ ZSI/ Fisheries Survey of India, and other such relevant institutions. For this organize workshops (national as well as at ecoregional/ biogeographic zone levels) to develop institutional mechanisms and capacity building for scientists and 'barefoot taxonomists' to interact with each other. This should include:

a. Development of material in a variety of formats (print and AV), including identification keys, for 'barefoot taxonomists' to enhance identification and information in biodiversity registers.
b. Discussion and documentation of identification and classification methods used by barefoot taxonomists.
c. Discussion on IPR issues
d. Joint training programmes in different regions using the experience of preparation of CBRs so far, including that of resource monitoring in the BRT Sanctuary by the Soligas.

Priority: 1
Timeframe: 1 year to initiate
Key players: NGOs, specialist EE agencies, other agencies, including universities already working with communities. Support from MoEF NEAC may be used for this.

3. Enhance awareness of current biodiversity issues among local communities

Develop, in simple formats with examples and illustrations, and widely disseminate in several local languages, books and booklets on

a. National and global values of local biodiversity, agrobiodiversity and related knowledge and the needs and ways of protecting them
b. IPRs, and innovative practices in benefit-sharing
c. Negative consequences of exotics, hybrids and invasive species, and where information is available, on how to control them.
d. Threats to biodiversity
e. Environment and biodiversity related laws.

Specialist EE agencies must take up responsibility for developing

1 Home Garden sub theme draft SAP
2 Indigenous Knowledge sub theme draft SAP
3 Goa State draft BSAP
4 Community Based Monitoring subthematic draft SAP

simple formats and content and regional agencies, including universities can integrate locale-specific content and disseminate among communities they work with.

Priority: 1
Timeframe: 2 years to initiate
Key players: MoEF, WII, CEE, CPR EEC, NGOs and communities around protected areas; State forest departments

Support possible from NEAC, EOSE, Small Grants Programme

4. Education & communication for strengthening ecodevelopment

a. Prepare directory of individuals, NGOs, CBOs, institutions specifically working in and around PAs.
b. Capacity build the above and government functionaries in education and communication and participatory work, to enable them to work more effectively.
c. Using existing material and case studies such as those of Vivekananda Girijan Kalyan Kendra in the Biligiri Rangaswamy Temple Sanctuary[4] on ecodevelopment, develop basic reference material for CBOs, in local language and simple formats to enable NGOs, CBOs and community groups to take up these activities.
d. In areas where there are significant human-wildlife conflicts, develop and offer through state nodal agencies, locale-specific information and training package to support or strengthen sustainable biodiversity based livelihoods, and methods to mitigate conflicts, including methods to tackle crop depredation.

Priority: 1
Timeframe: 1 year to initiate
Key players:

5. Strengthen education and communication for effective Joint Forest Management

a. Enable wide sharing through various media, of experiences of JFM including analyses of success and failure of these experiences and learnings from these.
b. Foster capacity building of NGOs to facilitate JFM
c. Sensitize relevant local departments to the JFM process, and its step by step implementation.

Priority: 1
Timeframe: 1 year to initiate and ongoing
Key players: MoEF, Ministry of Tourism, Kanchendzonga Conservation Committee, state forest departments, state tourism development agencies, tour operators and other service providers, representatives of local communities, Indian Institute of Tourism Management; EQUATIONS, etc.

6. Develop ecotourism as a means of income for local communities

MoEF needs to set up a mechanism with the Tourism Ministry to establish nationally acceptable guidelines for recommended practices, codes of conduct and certification procedures. For this, experiences of Ecotourism, such as that in Kanchendzonga, and in other parts of the country, may be used, and if necessary, pilot projects done, to firm up a set of principles that ecotourism projects must follow. A national workshop may be organized to facilitate this. Pilot projects based on these principles and detailed guidelines can then be done in various representative situations in the country.

For pilot projects:

a Select tourism sites for pilot projects, ensuring a representative range of situations (including stakeholders and ecosystems) for the country.
b Organization of stakeholders' meeting at selected sites.

c Develop local strategies for conservation education through the sites, defining roles of various stakeholders, and assessing capacities.

d Conduct training programmes for stakeholders, including officials, community groups, tour operators, and hotels for the functioning of the interpretation programme and other facilities.

e Develop and implement educational programmes for local communities

f. Give local communities a stake (economic) in ecotourism especially at heritage sites.

g Set up interpretation and other facilities and hand over to the appropriate government and community institutions.

Priority: 2
Timeframe: 5 years
Key players: State Forest deptt, NGOs, people's institutions in selected site, Indian Inst of Tourism Management; EQUATIONS

7. Strengthen understanding of impacts of tourism and the role of local self government institutions[5]

In areas of high tourist visitation, and potential visitation, conduct workshops with local authorities and local communities, including on

a Rights of panchayats regarding tourism development in the area, and expectations from tourism industry.

b Management of tourism sites

c Visitor behaviour in tourist sites.

d. Sustainable volumes of tourist traffic

e. Appropriate regulatory infrastructure

Priority: 2
Timeframe: 5 years
Key players: National Innovation Foundation, ENVIS Centre for Appropriate Technology, NGOs

8. Popularize technologies for sustainable development

Prepare and publish popular material in local languages documenting the use of ecofriendly technologies.

Priority: 2
Timeframe: 5 years
Key players: NGOs and CBOs, Honey Bee Network, State Agriculture Universities

9. Document and disseminate experiences of environmentally sound farming

Using the experience of the Honey Bee Network, document 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. These case studies should be widely disseminated in local languages using farmers networks, extension workers, NGOs, CBOs, media, etc.[6]

Priority: 2
Timeframe: 5 years
Key players: Folk media groups, theatre, Min. of Culture, Museum of Man, Anthropological Survey of India, NGOs and CBOs, Centres of Excellence, MoEF, etc.

10. Develop communication skills of key groups in diverse ways (including oral communication) to support biodiversity education and communication

5 Tourism and Biodiversity sub theme draft BSAP
6 Deccan LAC draft BSAP

11. Strengthen community conservation

An innovative education/ communication strategy needs to be designed to strengthen traditional protection of community-conserved areas, keeping in mind that these traditions are in different contexts and are of different types. Organize a national workshop with the objective of developing the nature and scope of an enabling and innovative scheme to strengthen community conservation.

Priority: 2
Timeframe : 2 years
Key players: MTA, NITA, Conservation and Livelihoods Network

Kitchen Herbal Garden Programme

Foundation for Revitalisation of Local Health Traditions has designed and executed, in collaboration with reputed NGOs, CBOs and State Forest Departments of Peninsular India, a unique programme–the Kitchen Herbal Garden (KHG) Programme, since 1997. KHG program is an important measure to arrest the erosion of local health traditions and provide rural folk an easy access to primary health care. It encourages resource poor rural women to grow a package of fifteen to twenty carefully chosen medicinal plants in their backyards. These plants are complimented with a training program on growing and using these plants for the primary health care needs of the family and for livestock. An important feature of the KHG programme is that it is gender focused. The training inputs cover at least 3 to 4 women's health related problems/ conditions. This programme has elements very critical to improving the health status of women, who especially in the rural milieu, often tend to neglect their own health.

This is one of the largest herbal medicine outreach programs in South India, which has related conservation with community needs. It has reached to 1,20,000 households in peninsular India over a 5 years period. The capacities of people's organisations like women's Self Help Groups engaged in micro credit/ enterprise are sought to add value to the quality of life of the rural household. Prior to the actual implementation of the KHG program a participatory rural appraisal is done through which the primary health problems, effective home remedies for such problems and the resources required are prioritised. Hence the programme is region-specific and tailor-made to address the primary health care needs of any region. Probably this flexibility in the program has made it gain such popularity.

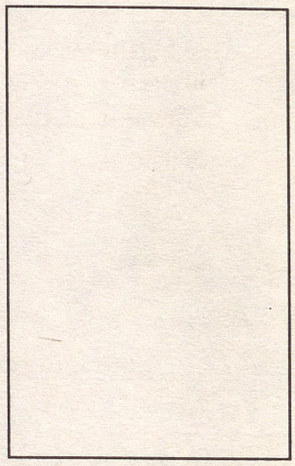
NGOs and CBOs act as the nodal centres for implementing KHG program. They train the Village resource persons (VRP) selected by the respective women self-help groups (SHG) and provide them with suitable training material. The VRP in turn train the SHG members at the village level. The NGOs or the SHG set-up their nurseries and provide the planting material to the households. Each KHG unit costs Rs. 70/- and the money got through training fees is ploughed to the SHG fund. This money is used for micro-credit needs of the community.

The socio-economic impact of KHG program is assessed through benchmark and quantitative studies. These studies reveal that a resource poor rural household in Tamilnadu spent five hundred to two thousand rupees annually on medical treatment for ailments where cures exist in local health traditions. KHG as a first response to a primary health care problem at the household level, helps such families to cut their costs, and also become self reliant in primary health care. At macro level KHG has definite implications on the health budget of the State Government in these days of declining allocations to health care. Culturally, the KHG also offers a method to promote and thereby revitalise indigenous knowledge which is threatened.

The implementation of the Kitchen Herbal Garden (KHG) programme using the people-to-people process as an extension strategy has demonstrated three values – which can be used to design a successful collective developmental initiative -

Pune Alive

Ranwa, a voluntary organisation in Pune, involved two dozen college students and teachers in conducting, compiling and publishing a biodiversity assessment of Pune urban area, indicating zones and interventions of conservation concern. Findings include extinction of a quarter of fish species, decline of snake populations, and habitat destruction by infrastructure development, some of which could have been curtailed with proper prior studies.



Through a small project under the UNDP GEF Small Grants Programme titled 'Ecosystem Assessment and Planning Inputs for Northern Western Ghats' Ranwa has assessed local and regional impact of urbanization on the biodiversity of the Pune-Mumbai area with focus on Khandala and Pune; and land use changes in the study area. This was done through census techniques, and interacting with communities and local knowledgeable persons. Information on this was published through articles in local newspapers, internet, and by developing educational material.

Discussions are ongoing with various local government departments for working out ways of mitigating negative impacts on biodiversity.

Information on these projects is available on http://www.ranwa.org/punealive

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, Hyderabad, Mumbai) also have protected areas and reserve forests.

There are NGOs in cities who 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, greening etc.

However, there is a critical need to educate urban citizens about the impacts on biodiversity of their 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.

People living in urban areas are aware of wildlife and biodiversity in natural areas, but often do not appreciate biodiversity in their own surroundings.

Involving urban communities more actively in ward-level issues can help bring a measure of responsibility and thought to local natural resource management. Sites such as museums, zoos, botanical gardens 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.

Desired Actions

1. Popularise environmental best practices especially in ward level forums.
2. Promote awareness programmes about how these can contribute to larger scale environmental conservation.
3. Enhance awareness about ecosystem services
4. Taking awareness to action among citizens groups
5. Enhance networking among nature clubs and promote people's initiatives to inventorise urban environmental assets.
6. Enhance awareness of macro biodiversity conservation and loss
7. Promote awareness of lesser-known foods and the linkages of biodiversity with nutrition.
8. Link consumer education to lifestyles
9. Enhance the role of museums, zoos, botanical gardens

Desired Actions

Priority 1
Timeframe 2 years to initiate and develop core materials and capacity building is ongoing.
Key partners: NIUA to support creation of such material by a variety of NGOs, in different cities. ENVIS Centre for Human Settlements, support from NEAC for NGOs for creating and adapting material

1. Popularize environmental best practices

a. Document and publicize, through media and NGOs, best practice case studies related to reducing impacts of urban lifestyles and consumption, waste management, water conservation, energy conservation, greening urban spaces, ecorestoration of biodiversity rich habitats, etc.
b. Capacity build public awareness / relations cells in municipal corporations and councils, and NGOs to develop, adapt and widely disseminate education/ communication material to promote awareness among the urban populace on the above mentioned issues.
c. Develop methods to reach these to ward and locality level civic forums.
d. 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.

Priority 2
Timeframe Ongoing.
Key players:
NLSIU, NCAS

2. Taking awareness to action among citizens groups

There is a need to link public awareness efforts to advocacy and action. 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 ...'.

Priority 2
Timeframe Ongoing.
Key players: BNHS, WWF, CEE, NGC clubs of MoEF

3. Networking nature clubs

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.

Priority: 1
Timeframe: 1 year.
Key players: CEE, Kalpavriksh

4. Enhancing awareness of macro biodiversity conservation / loss

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.

5. Promoting awareness of lesser known foods

Initiate a biodiversity campaign in collaboration with commercial agencies for promotion of lesser-known varieties, such as of rice or mango, in order to create a demand for these which in turn will induce farmers to cultivate and conserve these varieties..
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.

Priority 2
Timeframe 1 year .
Key players: Advertising agencies, television channels and programmes on recipes, food, home care and nutrition
ENVIS centre for EE

6. Link consumer education to sustainable lifestyles

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. To facilitate this, organize a national workshop with following as outputs

a Strategy for linking consumer education to environmental issues and lifestyles, especially in urban high consumption families/ sectors of society.
b Awareness strategy to reach consumers
c Work out ways of networking urban consumers with farmers producing diverse, lesser-known foods.

Priority 1
Timeframe Ongoing.
Key players: CERC, VOICE

7. Enhance the role of museums, zoos, botanical gardens

a Organize workshops for managers, curators of museums, zoos, and botanical gardens on the potential of such sites for conservation education, tools such as interpretation, and the need for proactive environmental awareness campaigns and outreach activities by these facilities.
b Develop interpretive programmes in a range of facilities, including city parks, botanical gardens, zoos, museums (not only those devoted to natural history), college musuems, places of worship (which have biodiversity related legends/practices), monuments etc.

Priority 2
Timeframe 4 years.
Key players: CEE, NMNH, Museums Assoc. of India, National Museum

Support from ICOM, CZA, BSI, NEAC?

Support may be accessed from ICOM for digitizing information on collections of natural history museums.

Formal Education Systems

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

School EE in India: A Historical Perspective

The movement of Basic Education launched by Mahatma Gandhi in 1937, was perhaps the first serious attempt at relating education in schools to local environmental needs. The essential elements of Basic Education were: productive activity in education; correlation of curriculum with the productive activity and the social environment; and intimate contact between the school and the local community. The best that Basic Education had to offer was incorporated in the Report of the Education Commission (1964-66) so as to relate it to the life, needs and aspirations of the nation.

- The Study Groups (1967) constituted by NCERT incorporated environmentally-relevant components in the experimental editions of biology textbooks and teachers guides for the middle and the higher secondary levels.
- The documents, "Curriculum for the Ten-Year School: An Approach Paper (1975)" were developed as a result of two years of work of a large number of educationalists. These documents underline the need for environmental education which, according to these documents, needed to cut across the entire gamut of school education, through relevant subject disciplines.
- Based on the "Curriculum for the Ten-Year School: A Framework", NCERT (1974-77) developed syllabi, textbooks and other instructional materials through the active involvement of experienced teachers, subject specialists and representatives of State Institutes of Education. States have incorporated this environmental orientation in their efforts.
- The National Curriculum Framework for School Education, 2000 too recognizes the importance of EE and addresses issues including minimum levels of learning, the use of information and communication technology, and the management and accountability of the system.
- NGOs all over the country have developed several innovative programmes for strengthening EE in schools.

EE is in one sense an integrating discipline, bringing together learnings in Science, Social Studies, Mathematics and more, At the same time it is a perspective – a way of looking at things, of analyzing, of evaluating. One question often asked is whether Environment should be a separate discipline or whether environmental concerns should be infused in the curriculum through various subjects, This has been a subject of debate the world over. By and large in India, the approach has been of Environment as a composite subject at the primary level, infused into various subjects at the middle and high school levels and as a separate subject at the college level.

The reality is that all the three approaches need to be taken simulta-

neously rather than sequentially. EE cannot replace the rigour of the basic disciplines. Indeed a good understanding of social studies, mathematics and laws of science is essential to be able to understand environmental issues. There is a strong case therefore for the introduction of an environmental studies programme at all levels of education. The NCERT has worked consistently towards incorporating environmental concepts in textbooks, as also training teachers for EE.

Much has been done for strengthening EE in schools through initiatives like the Scheme for Environmental Orientation to School Education (EOSE) of the Ministry of Human Resource Development (MHRD), the work of the Centres of Excellence of the Ministry of Environment and Forests and the MoEF National Green Corps scheme. The MHRD through the NCERT is working towards environmentalizing curricula and textbooks and in teacher training. Various states have also taken both curricular and co-curricular initiatives.

Over the years, several NGOs have also responded to the need for EE in the formal school system, and have made efforts to enrich the school experience, both for teachers and students.

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, the Nature Clubs of India programme of the WWF for Nature India, the work of the schools of the Krishnamurthy Educational Foundation, efforts of Vivekananda Kendra, especially in Arunachal Pradesh, CEE's National Environmental Education Programmes for Schools, and several hundred initiatives taken by concerned parents, teachers and others in the community. These projects range from integrating environmental concerns into curricula and textbooks, to extra- or co-curricular activities, such as slide shows and nature camps, to development of locale-specific materials and teacher-orientation.

An innovative recent initiative is the 'Environmental Education in School System (EESS)' is a subcomponent of the India Environment Management Capacity Building Project undertaken by the Ministry of Environment and Forests (MoEF), Government of India, and supported by the World Bank. Centre for Environment Education is the Consultant to MoEF for the implementation of this project. Phase I (completed) involved a detailed study of the status of infusion of environmental concepts in school curricula in the country and the status of teaching of EE in schools. This was undertaken by the Bharati Vidyapeeth Institute of Environmental Education and Research, Pune. Phase II is underway, and involves pilot implementation of the programme in eight states at the middle school (Std VI, VII, VIII) mainly through impacting the teaching of Science, Social Studies and Languages and through extra and co-curricular activities. The participating states are Andhra Pradesh, Assam, Goa, Jammu & Kashmir, Maharashtra, Orissa, Punjab and Uttaranchal.

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** raises demand, identifies local resident to be guruji/teacher and provides startup space for school
- The **Panchayat** appoints 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.

The EGS has received the Commonwealth's Gold Award for innovation in 1998.

dEcoCraft

dEcoCraft was an experiment in environment education, carried out in a few schools in Mulshi taluka, Pune districtand Kashele village, Raigad district in Maharashtra. It was taken up by CEE in association with the Academy of Development Sciences and the Bharati Vidyapeeth Institute of Environment Education and Research, with support under the EOSE scheme of the MHRD.

Working with their teachers, students identified specific crafts and artefacts in their area which depend on local natural reources as raw material. The students worked with local artisans to understand how the artefact is made, and how it uses local natural reosurces sustainably. They were encouraged to themselves learn the processes and skills involved in the craft, and to make small models of the artefact they studied. They also explored to some extent the raw materials used, the status of the raw materials, and whether the artisans had anything to say about the supply of raw material over the last few years. In sum, the teachers and the students used local craft traditions as a learning resource.

Some of the artefacts that students studied in Kashele included the plough, the *irla* (raincoat made of bamboo and teak leaves), mot (a leather pouch to draw water from a well), etc.

Some of the ongoing mechanisms which support extracurricular 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 are being provided financial assistance by the Central Government for organization 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, audiovisuals, teacher training programmes, school activities, volunteer training etc. This scheme is currently being revised.
- Many schools and NGOs access support under NEAC to conduct a variety of awareness programmes and have developed educational material.

Innovations at the state level

Initiative has been taken by some state governments to enhance school-based EE. In Maharashtra, the State Bureau of Textbook Production and Curriculum Research has developed supplementary material to facilitate EE. The Delhi Government launched its eco-clubs several years ago. In Madhya Pradesh, the Education Guarantee Scheme provides a model for how the curriculum can be enhanced with locale-specific teaching material and situations (see box).

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

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.

Such a mechanism 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. [2]

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.

Traditional knowledge systems

Formal education, as well as NGO-driven extracurricular initiatives need to widen their scope and give due importance to traditional knowledge.

There is also a need to learn from traditional teaching-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.

The institutions of the formal system, as well as academic institutions can help by validating traditional knowledge systems and methods of transfer of information, and providing insights into the nature and scope of indigenous knowledge.

Actions

1. Scaleup the EESS experience to more schools and states
2. Strengthen the EOSE scheme to develop innovative projects and materials

Integrating Biodiversity Education in 10 Shiksha Mission Schools

The Shram Niketan Sanstha, in Shahdol, MP, took up a 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 teaching about the environment. 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.

3. Enhance EE in states opting for Education Guarantee Scheme
4. Enhance development of locale-specific biodiversity related material
5. Enhance 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 to complement the latter without compromising the discipline of either

Priority: 1
Timeframe : Initiate immediately
Key players: MHRD, MoEF CEE, BVIEER, State depts of education, State level NGOs involved in school-based EE, NCTE, NIEPA

1. Extend the EESS experience

a) Facilitate widespread sharing and use of the experience of greening textbooks and that of teachers and other stakeholders in the pilot implementation in 8 states.

b) Education Deptts in all states should make available time and space to integrate the findings of the study of Phase I into future curricula and textbooks to be developed in the state, and the learnings from the pilot implementation phase, into the processes of textbook and curriculum development of other states.

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.

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.

e) Develop mechanisms for providing career based incentives to participating teachers.

Priority: 1
Timeframe : Initiate in 1 year, and keep ongoing
Key players: MHRD, Nodal agencies for EE and other NGOs.

2. Strengthen the Scheme for Environment Orientation to School Education to develop innovative projects and materials

3. Enhancing the role of NGOs and scientific institutions in school-based EE

Recognizing the role of NGOs in strengthening EE in schools, initiate a scheme for involving NGOs in school programmes and for supporting (including capacity building and financial support) NGOs in each district, using the NEEPS experience.

Priority: 1
Timeframe : Initiate in 1 year, and keep ongoing
Key players: MHRD, Nodal agencies for EE and other NGOs.

Locale-specific biodiversity education, can play a key 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 and therefore not able to go in depth into specific local issues. State of the art approaches need to be developed for location-specific biodiversity education.

4. *Enhance EE in states opting for Education Guarantee Scheme*

a. Take stock of Shiksha Mission and HSTP experiences in MP.

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.

Priority: 2
Timeframe : 2 years
Key players: UNICEF, MHRD, EOSE, relevant State Education Deptt, Local NGOs, EGS NGOs, CEE

5. *Enhance 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.

Priority: 2
Timeframe : Ongoing
Key players: MHRD, MoEF, CEE. CPR EEC

6. *Enhance integration of ecofriendly technologies in Vocational and Technical Education and Training*

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. This would include developing course outlines, and working out mechanisms for instituting the courses.

Priority: 2
Timeframe : 4 years
Key players: MHRD, PSSCIVE, Selected NGOs, ENVIS Centre for EE, ENVIS Centre for Appropriate Technology

7. *Strengthen interaction of EE agencies with teachers' networks*

a. 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 strengthen their activities.

b. Strengthen interaction of EE agencies with these associations.

Priority: 2
Timeframe : Ongoing
Key players: Nodal agencies for EE, NGOs in school-based EE

8. *Encouraging integration of traditional knowledge systems in formal systems* (reference IK subtheme SAP)

a. Research and document systems of teaching and learning in indigenous knowledge systems. In some fields such as the performing arts, martial arts, indigenous medicine etc. this has been already done extensively. This could be used as a model for documentation in other fields.

b. Take up action research projects to try these out as mechanisms for revitalizing traditional knowledge, as well as for providing locale-specific education.

Priority: 2
Timeframe : Ongoing
Key players: MHRD, NCERT, nodal agencies for EE

9. *Using sacred groves/ ponds/ lakes as resources for EE.*

The BVIEER has been using sacred groves in the Sahyadris as effective educational resources for biodiversity awareness, for schools in the vicinity. This and other similar experiences could be extended to other schools near sacred biodiversity rich areas. This can be done through the NGC scheme of the MoEF. Nodal and Resource Agencies of NGC can facilitate development of appropriate educational material in local languages. Schools can work with communities to declare such areas as mini-community-protected / conserved areas.

Priority: 2
Timeframe : 2 years
Key players: MoEF, Nodal and Resource Agencies of the NGC.

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

Higher and Professional 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); that for technical education is the All India Council for Technical Education (AICTE); and the Indian Council for Agricultural Research (ICAR) for agriculture education. These would be the key institutional structures for incorporating environment and biodiversity concerns into the respective streams.

Despite the Supreme Court ruling of 1991, most colleges have not actually introduced environmental courses. There is also a concern that there is inadequate field work needs built into the curricula of life science courses. However, several universities do offer postgraduate courses in Environmental Science. The biodiversity component in these Environmental Sciences needs to be assessed.

At the systems level, 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. In medical education greater emphasis is required on linkages between biodiversity and the formulation of drugs. The role of biodiversity in natural pest control and its relation to epidemiology and environmental health is needed to be understood and incorporated. The ICMR and IMA have a role in this.

Several 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 se-

ries 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.

Technical education broadly covers programmes of education, research & training in Engineering & Technology in the field of Architecture, Town planning, Management, Pharmacy and Applied arts and Crafts.

There is a great 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. 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 Actions

1. Follow-up on Supreme Court ruling for introducing environmental course at undergraduate level.

Priority: 1
Timeframe: 1 year to initiate programme
Key players: UGC, all Universities, MoEF, Nodal agencies for EE, other identified institutions for every state to be associated with each university

a. 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 on environment in all faculties.
b. UGC to work with universities to include dissertation projects based on biodiversity related field-studies at undergraduate and postgraduate levels for disciplines including Life Sciences, Environmental Sciences, Economics and Social Sciences, with credits for the same.
c. UGC to work with MoEF to identify and contract an agency to develop and initiate teacher-training modules in biodiversity education at college level, including for refresher training.
d. UGC to support development of bibliography on materials already available.
e. Refresher courses for college teachers should have biodiversity components.

2. Foster EQM, biodiversity mapping and census projects

Priority: 1
Timeframe: 2 years
Key players: UGC, Local colleges, Indian Academy of Sciences, CEE, WWF, other NGOs, State Forest Deptts

a. University life science departments to develop and foster linkages between colleges and State Forest Depts in order to include college students in environmental quality monitoring and wildlife census work.
b. State Forest Depts should initiate periodic training in monitoring and census techniques for college teachers, students.

3. Promote taxonomy as a discipline

Priority: 1
Timeframe: 2 years
Key players: MoEF and UGC, through universities and colleges, ZSI and BSI regional units, and local community experts.

There is a need to revive interest in taxonomy among botany and zoology faculties and students . For this, set up a grants scheme to:

a. Produce inexpensive and popular field guides on local flora and flora

b. Take up action research for developing programmes to help build a cadre of parataxonomists drawn from the local community, working closely with college teachers/students

Priority: 1
Timeframe : 2 years
Key players: AICTE, IIT Mumbai, ENVIS Centre for Appropriate Technology, WII, Anna University, IISc and CES

4. Introduce specialist courses on conservation biology and environmental remediation

Identify and support a few universities and institutions to develop curricula and offer these courses. The intake to these courses should be limited and placement of graduates should be thought through as carefully as the syllabi.

Priority: 1
Timeframe : 2 years
Key players: Bar Council of India, NLSIU

5. Strengthen Environmental law training

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.

Documentation of key environment and biodiversity related law suits is ongoing at these institutions; there is a need to develop these as course material and introduce these into existing law courses.

Priority: 1
Timeframe : 2 years
Key players: AICTE, using support available under its schemes such as Thrust Area Programme in Technical Education

6. Strengthen Environmental engineering training

In order to sensitize engineering course students to environment and biodiversity concerns, especially vis a vis impact on natural resources of professions including civil, mining, chemical, and production engineering etc., there is a need to:

a. Develop basic course guidelines, materials on environmental concerns, as well as discipline-specific content on energy conservation and efficiency, minimizing impact, remediation, regulations, etc.
b. Direct all engineering colleges to adopt such courses.

Priority: 1
Timeframe : 2 years
Key players: Depts of Journalism and Mass Communication/ Communication Studies, UGC, EMRCs, FTII, Journalists associations, Centre for Media Studies, CEE

7. Integrate environment and biodiversity concerns in print and AV Journalism courses

a. 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 subject. Where possible, this can be done by broadening existing subjects such as development communication or development journalism.
b Introduce student awards for environmental reporting and film-making.

8. Integrate biodiversity concerns into agriculture education and research

Initiate a participatory process of ICAR, SAUs, specialized institutions supported by ICAR, KVKs to examine the integration of biodiversity concerns into agricultural education and research.

Priority: 1
Timeframe: Immediate
Key players: Ministry of Agriculture, ICAR-SAU system, State Deptt of Agriculture, MoEF (also involving individuals from the NBSAP TPCG, Domesticated Biodiversity TWG), UNDP?

For this, organize a national and regional (biogeographic region wise) workshops to develop guidelines, create interest and stakes among the formal agricultural education and research community, estimate budget and timeframe.

An input into this workshop could be a document gleaning out and consolidating the concerns for conservation of domesticated biodiversity, agro ecosystems, livelihood security of agriculture based population, nutrition related concerns, indigenous knowledge etc from the relevant NBSAP documents ICAR should also,

- 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).
- Commission a project for revamping student projects/ field experience terms to include biodiversity studies.
- Arrange to modify syllabi to incorporate biodiversity concerns.
- Work with MoEF to identify and contract agency/ agencies to develop appropriate instruction material for different faculties, and also work for instructor orientation.

It is also necessary to

- Document success stories in organic farming and initiate efforts to replicate them in different biodiversity contexts, through the SAU research efforts.
- Incorporate farmers' indigenous knowledge into formal curricula.

9. Strengthen agricultural extension education in SAUs

Priority: 1
Timeframe: Immediate
Key players: Relevant line departments, NABARD, NGOs working with communities; NIRD and SIRDs, CEE, SAUs

Some support possible for NGOs through SGP.

a. 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.
b. Capacity-build SAU extension faculties in innovative methods of extension, using examples of technologies supportive of agro-biodiversity conservation.
c. 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.

d. Strengthen women's colleges and courses in agriculture. Especially evolve guidelines for integrating impacts of technologies developed on the role of women in farming.

e. Develop guidelines for agricultural researchers to use diverse parameters not just production and productivity.

Government Agencies and Decision Makers

Central and State Planning

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.

How far is biodiversity actually integrated into the development planning process in India? Is it considered an essential element when ministries and departments make their plans and budgets, or is it relegated to one ministry/department having to monitor the others?"

Ashish Kothari, note prepared for discussion at multi stakeholder consultation at Goa towards preparation of the WSSD India document.

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.[1]

The linkages between livelihoods and biodiversity/ other natural resources and sustainability issues need to be understood and internalized by all Planning Commission 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. 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. 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.

Towards this, it is felt that the following government agencies and

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

decision makers in the following systems need to be addressed:

- 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

Desired Actions

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

1. Orient national planning agencies

Priority: 1
Timeframe : Immediate upon acceptance of BSAPs.
Key players: MoEF, Planning Commission, National Development Council

Development of kit should be taken as immediate priority.

Biodiversity concerns need to inform the planning process, especially for sectors that directly impact biodiversity use and conservation for example Education, Women and Child Welfare, Agriculture, Chemicals and Fertilizers, Commerce and Industry, Forests and Wildlife. Orientation programmes for working groups in the planning process are necessary. It is also important to support these groups with usable sector-specific information. A mechanism could be set up by MoEF towards this. This could be:

a 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.

b Based on these notes, a presentation and orientation kit containing overall biodiversity concerns, as well sector-specific recommendations could be prepared.

c Presentation workshops for the relevant Planning Commission working groups, could then be organized when they are set up for the next plan.

2. Orient state planning agencies

a 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.

b A series of seminars and field visits should be organised for State Planning Boards and working groups on the issues of biodiversity, conservation methods and technologies. These seminars should focus on how biodiversity concerns and possible solutions can be integrated into various programmes and schemes at state level.

For example, in schemes related to agriculture, components for facilitation of seed banks at Panchayat level, agricultural technology, IPM, INM need to be integrated; in schemes for watershed development, the use of local grass, shrub, tree species, local forage vegetation on village commons and also the concepts of protection/ conservation of village commons need to be promoted; in schemes for rural development, women and child welfare, and support to self help group, components on providing opportunities for products and technologies that aid biodiversity conservation and which can be used for income generation need to be integrated; in schemes for housing, the use of such technologies that reduce external high cost inputs and use local materials such as bamboo for roads and buildings can be integrated; in schemes for social forestry, the use of local indigenous varieties that communities desire need to be promoted and exotics discouraged.

Priority: 1
Timeframe : 2 years for development of core material and ongoing capacity building and orientation.
Key players: MoEF, Dept of Personnel and Training of the Ministry of Personnel, Public Grievances and Pensions, State SAP nodal agencies
State training academies to introduce regular courses for members of state planning boards, working groups.

3. Enhance recognition of EAT as a tool of change

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:

a 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.

b Commission media persons, and NGOs, for documentation of such case studies.

c Material produced out of this should be disseminated to relevant agencies and individuals involved in national and state planning.

d These case studies should also be made available to the agencies that would be taking up the implementation of 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.

Priority: 1
Timeframe : 2 years
Key players: MoEF to initiate scheme, and identify nodal agencies to execute it.

This box indicates the working groups set up for the Tenth Five Year Plan. 'Shadow' working groups could be set up for the biodiversity related groups out of these.

Working Group for the formulation of Tenth Five Year Plan (2002-2007).

1. Agriculture Division
   - Agriculture Credit, Cooperation and Crop
   - Horticulture Development including Spices Aromatic and Medicinal Plants and Plantation Crops
   - Agriculture Infrastructure/ Warehousing/Rural Godowns/ Marketing/Post Harvest Management, Processing and Cold Storage, Trade and Export Promotion.
   - Crop Husbandry, Demand and Supply Projections and Agricultural Inputs
   - Agriculture Research and Education
   - Animal Husbandry & Dairying
   - Agriculture Statistics
   - Watershed Development, Rainfed Farming and Natural Resources Management
   - Agriculture Development in Eastern and North-Eastern India
2. Backward Classes Division
   - Empowering the Scheduled Castes
   - Empowering the Other Backward Classes (OBCs)
   - Empowering the Minorities
   - Empowering the Scheduled Tribes
   - Empowering the Disabled
   - Reforming the Social Deviants and Caring the Other Disadvantaged
   - Empowerment of Women
   - Development of Children
3. Communication & Information Division
   - Post
   - Convergence and E-governance
   - Information Technology
   - Telecom
   - Information & Broadcasting
   - Impact of IT and Telecom on Other Sectors of the Economy
4. Development Policy Division
   Public Distribution System and Food Security
5. Education Division
   - Sports and Youth Affairs
   - Elementary and Adult Education
   - Vocational Education
   - Education for Disadvantaged Sections
   - Secondary Education
   - Higher Education
   - Technical Education
   - Art & Culture
6. Environment & Forest and Tourism
   - Environment
   - Forestry
   - Wildlife
   - Research & Education for E & F Sector
   - Tourism
7. Financial Resources Division
   - Savings
   - State's Resources
8. Housing & Urban Development Division
   Urban Development, Urban Housing and Urban Poverty
9. Health & Family Welfare Division.
   - Health Care for Women & Children
   - Implementation of Population Policy and Rapid Population Stabilisation
   - Improving Micronutrient Nutritional Status of the population
   - Development of Human Resources for Health
   - Communicable Diseases
   - Health Economics
   - Health Cares Services
   - Health Education & IEC
   - Indian Systems of Medicine & Homoeopathy
   - Health Systems Research and Biomedical Research and Development
   - Non Communicable Diseases
   - Environment & Occupational Health
   - Improving Nutritional Status of population with special focus on Vulnerable Groups
10. Industry & Minerals Division.
    - Drugs and Pharmaceuticals
    - Fertilisers
    - Leather and Leather Goods Industry
    - Public Sector Reforms and Privatisation
    - Textiles and Jute Industry
    - Mineral Exploration and Development (other than Coal and Lignite)
    - Ship Building and Ship Repair Industry
11. MLP Division .
    - Hill Areas Development Programme/ Western Ghats Development Programme
    - Border Area Development Programme
12. Power & Energy, Energy Policy and Rural Energy Division
    - Petroleum and Natural Gas
    - Coal & Lignite
    - Power
13. Programme Evaluation Organisation
    - Strengthening Monitoring and Evaluation System for the Social Development Schemes in the Country
14. Rural Development Division
    - Rural Poverty Alleviation Programmes
    - Decentralised Planning and Panchayati Raj Institutions (PRIs)
15. Transport Division
    - Civil Aviation
16. Village & Small Industries Division
    - Small Scale Industries (SSI) Sector
    - Food Processing Industries (FPI) Sector
17. Water Resources Division
    - Rural Drinking Water Supply and Sanitation
    - Private Sector and Beneficiaries Participation Programme
    - Major & Medium Irrigation Programme
    - Minor Irrigation Programme
    - Flood Control Programme
    - 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 Sabhas (about 2000). It is the elected representatives of the people who influence the shape of development in the country to a very large extent. Therefore if sustainable development and biodiversity concerns inform the agenda of political parties, this will be translated into policies. A bottom-up pressure from the electorate is essential for this.

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.

Existing or ongoing initiatives for orienting elected representatives to environment and development concerns include occasional programmes organized by institutions such as the National Institute of Rural Development (NIRD), Hyderabad 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.

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.

Desired Actions

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.
3. Through dialogue with elected representatives, identify constituency-specific biodiversity issues.

1. Identifying channels to reach elected representatives

As preparation for reaching various political parties, make directories of:

a. Relevant legislative committees at state and central level.
b. List of individuals to be contacted in each political party.
c. Agencies that have orientation programmes and publications for elected representatives, or are conducting research and advocacy on policy issues.

Online Debates

cee.envirodebate.org is a website forum for online debate and discussion on key environment and development issues. The forum aims to involve policy makers, media, industry, NGOs, local stakeholders and the general public, nationally and internationally. Besides online debates, the website also draws upon live events, such as meetings and workshops on topics being debated online. The website debates are updated with key points arising out of the live events. Ongoing debates include Sustainable Strategies for Medicinal plants; Strengthening JFM in India; Reviewing Protected Area Categories; People's Biodiversity Registers; Ecotourism - Boon or Doom?; Biodiversity-based Livelihoods: Are they sustainable.

Priority: 1
Timeframe: 1 year
Key players: ENVIS Centres for EE and Panchayati Raj

Priority: 1
Timeframe: 1 year to initiate and ongoing
Key players: ENVIS Centres for EE and Panchayati Raj

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.

Existing institutions that already have some programme for elected representatives - NIRD, Centre for Policy Research, chambers of commerce and industry, some state training academies.

2. Servicing information needs of elected representatives

a. 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. The kit may contain various media products, e.g. booklets, CDs, slide shows, films, website, etc.
b. Document and disseminate case studies and information on environmentally sound development policy and examples of where it has been put into practice
c. 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.
d. 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.
e. Provide forums for regular dialogue with other stakeholders especially biodiversity-dependent rural communities.
f. Network groups and individuals using the platform of their existing forums, i.e. committees, party meetings, party magazines, newsletters etc.
g. Foster the development of study groups at the constituency level to facilitate, document and disseminate information, and generate dialogue, on local biodiversity issues. 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.

Administration

There are several Central and state sponsored schemes related to natural resource management and sectoral resource development.

For example, there are schemes 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 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.

There is a need for the bureaucracy to understand biodiversity concerns and develop pro-conservation attitudes. Biodiversity concerns and the learnings from the Ecodevelopment, Joint Forest Management, EOSE schemes need to inform 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. Equally important is reformulation of schemes to create space and resources for capacity building.

There is a need to integrate biodiversity and capacity building concerns into central and state-sponsored developmental programmes and schemes, through inter-ministerial/ interdepartmental workshops and working groups.

Desired Actions

1. Integrating biodiversity and capacity building concerns into developmental programmes and schemes

a Develop a forum for interaction with key ministries and departments both at Central and State levels, on biodiversity related

Priority: 1
Timeframe: 1 year
Key partners: National Development Council
MoEF

Key partners at state level: State Government, Chief Secretaries, state SAP coordinators, Environment Dept working with relevant line depts.

issues, especially to introduce the NBSAP and specific sector SAPs as appropriate.

b Workshops/meeting of 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 organized by the MoEF and / or the National Development Council 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.

Local Self Government Institutions

In the rural areas of the country, Panchayat Raj Institutions exist/ 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.

Increasingly, several small scale development projects are taken up / facilitated by local self government institutions. It is essential to assess the environmental impacts of these. Such EIA processes can help build capacities in communities to make informed decisions about all development projects being taken up in their area. It is important to build capacities of and systems within local self government institutions to assess environment impacts of development projects. The experience of capacity building for and actual conduct of EIA for small-scale projects under the World Bank supported District Poverty Initiatives Programme can provide useful insights.

Velugu

The Andhra Pradesh District Poverty Initiatives Project (2000-2005) or Velugu, is being implemented by the Government of Andhra Pradesh through the Society for Elimination of Rural Poverty. Velugu is being implemented with support from the World Bank in six districts of Andhra Pradesh - Adilabad, Anantapur, Chittoor, Mahabubnagar, Srikakulam and Vizianagaram.The main objective of Velugu is to improve opportunities for the rural poor to meet priority social and economic needs. Centre for Environment Education (CEE) has been identified as the Environment Agency to develop and implement the Environment Management Framework for Velugu. CEE's role as Environment Agency is for a period of three years starting January 2002. The Environment Management Framework helps to:

- Prevent environmental degradation as a result of either the cumulative effect of many small CIF projects that individually have a negligible impact, or the impact of individually harmful projects.
- Promote the implementation of projects that can be expected to lead to improvements in local environmental quality
- To build capacity for environmental management at the local, district and state levels

Towards operationalization of this role, CEE has identified the following as the major components:

- Development of tools for use by the grassroots level and district level functionaries of the APDPIP for Environmental Assessment of the community projects
- Training of the grassroots level and district level functionaries of the APDPIP in environmental assessment of the projects and in raising community awareness of environmental conservation.
- To develop indicative projects that have a positive bearing on the local environmental quality.
- To conduct an environmental audit of the sub-projects on a six-monthly basis.
- To monitor the environmental conditions (through secondary data collection and documentation) to ensure that the APDPIP remains responsive to environmental concerns.

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 organizations 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 Organizations 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.

Desired Actions

Priority: 1
Timeframe : 1 year to initiate
Key players: MTA; Tribal Research Institutes; National Institute of Rural Development; ENVIS Centre on Panchayati Raj, State Institutes of Rural Development

1. Enhancing sustainable natural resource management through Panchayat Raj Institutions

a. Develop model course syllabi, materials and tools for orientation of Panchayat Raj institutions on biodiversity concerns. These should include local biodiversity concerns, and their links to national and global biodiversity concerns; threats to biodiversity; linkages between biodiversity erosion and local livelihoods; opportunities for sustainable use and enhancing livelihood security; methods to document local biodiversity; case studies of best practice; accessing support, etc. These programmes should help local panchayats to assess the status of their own natural resources, and aim at working out equitable and locally appropriate solutions for management in the current context.

b. Adapt model materials for locale specificity by the State Institutes of Rural Development, and relevant NGOs.

Priority: 1
Timeframe : 2 years
Key players: MoEF, Min of Rural Development, MTA, State Institutes of Rural Development, NGOs, CBOs.

2. Develop capacities of Panchayat Raj Institutions to assess environmental impacts of small scale developmental projects.

a. Develop guidelines for environmental impact assessments for small scale development projects, using the experience of the DPIP

b Assess the experience under the DPIP of developing capacities of individuals and local institutions for conducting EIAs.

c. Based on this, develop a methodology for widespread sharing of the need for impact assessments of small scale development projects, the processes for assessments, for accessing information and capacity building. Agencies working with local self government institutions have a key role to play in this.

Priority: 2
Timeframe : 2 years
Key players: MTA, MoEF, NGOs, CBOs working with tribal communities, Tribal Research Institutes.

2. Develop integrative mechanism between Ministry of Tribal Affairs and the MoEF focusing on biodiversity and sustainable development issues.

Since biodiversity conservation is intimately related to the welfare of tribal communities, a joint mechanism of the MTA and the MoEF is desirable to dovetail efforts. For example, EOSE was a centrally sponsored scheme of the MHRD but had representation of the MoEF in the Empowered Committee. A scheme to promote innovative educational initiatives for biodiversity conservation while taking into account tribal welfare should be started. Nodal agencies may include nodal agencies of the EOSE who have \experience of handling such educational schemes, and the Tribal Research Institutes.

3. Empowering tribal panchayats

Develop an orientation 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:

a Development of content

b Development of communication tools and methods

c Development of delivery mechanism through TRIs and NGOs

Priority: 1

Timeframe : 1 year

Key players: MTA, NITA, NGOs, CBOs working with tribal communities, Tribal Research Institutes.

"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?"

Ashish Kothari, in note prepared for multi stakeholder consultation at Goa, organised by CEE for inputs into preparation of the India WSSD document, Jan 2002.

The Ministry of Environment and Forests is the nodal agency in the country for participation in international agreements relating to environment such as the Conventionon International Trade in Endangered Species, Convention on Wetlands ofinternational importance, specially as waterfowl habitat, Convention onthe Conservation of Migratory Species of Wild Animals, Vienna Conventionfor the Protection of the Ozone Layer, Montreal Protocol on Substances that Deplete the Ozone Layer, Conventions on Biological Diversity andClimate Change, the Basal Convention on Transboundary Movement ofHazardous Substances, etc.

Priority: 1
Time frame: 1 year
Key players Ministry of External Affairs, MoEF and relevant ministries for all treaties that affect biodiversity

International

India is signatory to major international conventions and treaties regarding biodiversity. These include, besides the Convention on Biodiversity, the UN Framework Convention on Climate Change, Montreal Protocol, Kyoto Protocol, CITES, the Convention on Wetlands of International Importance, especially as Waterfowl habitat (Ramsar Convention), Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), and UNESCO's Man and Biosphere Programme.

A deep understanding and sensitivity to biodiversity concerns is essential for those involved in these discussions. It is equally important for those involved in trade negotiations and other treaties.

The Ministry of External Affairs (MEA) and the relevant ministries who negotiate environment and trade treaties should be able to access inputs from different stakeholders in the country to evolve the position or stand that they need to take on behalf of the country when key issues come up for discussion and for conferences of parties of different treaties.

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

1. *Enhance public awareness about international treaties*
   a. Using the experiences of the NBSAP India process and the WSSD preparation process, develop a framework for public awareness about all key international treaties related to environment (including trade related treaties), and methods of soliciting inputs from a variety of stakeholders in the country.
   b. Take up public awareness activities and processes for development of India perspectives for each of these treaties, using this framework.

2. *Orientation of India representatives*
   Develop a mechanism such as a multistakeholder seminar, for orientation of India representatives and for garnering inputs into the development of India's position for every COP or international meeting where key issues come up for disussion, with regard to the treaties mentioned above.

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 and 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 thesis titles on the internet.

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

A major concern in information gathering and availability is that local level data is generally not available, or where available, not easily accessible. With increasing decentralization, panchayats, taluka and district administrations are making the decisions that impact local

ENVIS

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 2003.

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

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. This also links up with the Right to Information.

For 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 better local decision making in respect of sustainable resource use. The necessity of the link between data providers and data users is well illustrated in such situations. Such links should be consolidated and institutionalized without becoming bureaucratized.

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 produces district gazetteers, which record a variety of information. Such gazetteers have been prepared for most districts. The preparation of gazetteers has now become erratic. However, despite often being outdated, they continue to be a very useful source of information.

Desired Actions

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

1. Documenting and publishing local biodiversity information

A gazetteer-like document for biodiversity, which would be easily available to those interested (including bureaucrats, academics, students), should be prepared and regularly updated for every district, and significant biodiversity rich areas outside protected areas. This would involve

a Developing a format for the content
b Identifying sources of information and methods of information collection
c Developing a mechanism for updation

To start with, a state biodiversity gazetteer should be developed for every state

Priority 1
Timeframe 3 years
Key players
MoEF, ENVIS Centre for EE, NGOs, colleges, local communities

2. Information related to protected areas

a. 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.
b. Encourage local colleges and institutions to undertake regular monitoring studies of protected areas, and to take part in census work. This process and the involvement of institutions, faculty and students may be incentive driven.

Priority: 2
Timeframe: 3 years
Key player Proposed State Biodiversity Authority/ Board State forest dept, Colleges and NGOs

3. Develop 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 IEMCBTAP, 90 nodes on various disciplines are to be set up by June 2003.

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:

a. Workshop on planning strategic communication activities, especially considering the information implications of implementing the NBSAP.
b. Evolving guidelines for the ENVIS centers and nodes for strategic communication and information dissemination, based on this workshop.
c. MoEF to make appropriate financial allocations to the Centres and nodes to support above activities.

This may mean that ENVIS Centres will need to define for themselves where they will access information and in what manner.

Priority: 1
Timeframe: 1 year
Key players
MoEF ENVIS Focal point; CEE as ENVIS EE node can take up the responsibility of helping build capacities in ENVIS nodes in communication.

Information for Empowerment

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 .
    - 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.
    - 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 taluka 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 MoEF 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. It conducts a variety of urban management related training programmes including management of urban environment.

However, the biodiversity content in these training programmes needs to be enhanced. This has to be done in two ways: by integrating biodiversity concerns in sectoral training programmes, as well as by initiating new courses. Besides several new areas have been identified

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.

during the NBSAP process, which need to be addressed in regular in-service training for staff in various developmental sectors.

Strategy

Assess and strengthen 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 1
Time frame 2 years
Key players
Dept of Personnel and Training, all State Training Academies, MoEF. Working groups should consist of academics, NGOs, administrators

1. Strengthen biodiversity-related training for administrators

a. 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.
b. Special locale and need specific courses / modules and related material and training methodologies should then be worked out.
c. Initiate regular faculties / departments of environment in the national and state training institutions. The YASHADA experience could be a basis for this.

Priority: 1
Timeframe : 2 years
Key players: MoEF, WII, IIFM, ICFRE, FRI, and other institutions, including NGOs.

2. Strengthen biodiversity-related training forForest management staff

a. 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.
b. 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, and EE agencies.
c. Maximum concentration of training on biodiversity issues needs to be given to frontline staff.
d. Develop mechanism for continued capacity building.
e. Arrange training programmes and refresher courses for protected area staff on new and emerging aspects of biodiversity use and conservation (Terrestrial Ecosystems SAP).

Priority: 1
Timeframe : 2 years
Key players: NIUA, ENVIS Centre for Human Settlements, All India Institute of Local Self Government, Mumbai, Centre for Environmental Planning and Technology, Ahmedabad, NGOs working on biodiversity issues in urban areas

3. Strengthen biodiversity-related training for urban managers and planners

a. 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.

b. 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.

c. Set up a mechanism at state level to ensure that staff of municipal authorities undergo such training.

4. *Strengthen biodiversity related training for scientists and researchers.*

Priority: 1
Time frame: 2 years
Key players: MoEF, research and autonomous institutes under the MoEF

Researchers involved in various aspects of natural resource conservation need orientation/ training on biodiversity so that they effectively plan for linking research with conservation of biodiversity.

a. Courses on enhancing understanding of biodiversity and issues related to biodiversity should be developed and offered through premier national training institutions and offered from time to time, in a planned manner, for the major national research institutions working on different aspects of biodiversity.

b. Training institutions can also work out methods for continued capacity building of researchers, through online and distance modes, e-discussion groups etc.

Training modules on Medicinal plants conservation for the Forest Guards, Foresters and Range Forest officers.

FRLHT's training unit with its 9 years experience of designing and conducting more than 100 need based training courses for the field forest staff of Karnataka, Kerala, Tamil Nadu, Maharashtra and Andhra Pradesh has developed package on Medicinal plants conservation for the use of the trainers in the forestry training institutes.

These self-contained modules, which contain Illustrated lessons, Learning activity, OHP sheets, 35-mm slides and trainers instructions pay equal emphasis on Technical and social aspects of Medicinal plants conservation. These can be ideally delivered as a capsule course of 5-7 days.

The package, equipped to meet the requirements of the Forest college trainers coves the following titles.

- Biodiversity & benefits
- Introduction to Medicinal plants diversity
- Cultural significance of medicinal plants
- Medicinal plants collection methods
- Conservation status of medicinal plants and relevance of insitu conservation
- Field identification of Medicinal Plants
- Botanical surveys
- Nursery & its Management
- Propagation of Medicinal Plants
- Community participation for Conservation .
- Species Recovery Program to save endangered species

The Forest departments of Tamilnadu, Kamataka and Kerala have agreed to incorporate these modules into the forestry training curriculum, and the forestry training institutions have already started using these modules in the induction and refresher courses for the Forest guards, foresters and Range Forest Officers.

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. Efforts to promote cleaner production and environmental awareness include those through certification processes, seminars, etc. 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 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.

Strategy

The approach needs to be sector, scale and region specific. Priority should be given to industries which are major consumers of biomass, propagators of biomaterials (eg. seed-sellers) and those which impact biodiversity. The priority sectors identified are Pharmaceutical, Paper, Agro and Food Processing, Mining, Tourism industries. EIA methodologies and requirements need to be reexamined and legislated, to include biodiversity concerns. There is also a need to train EIA consultants in biodiversity concerns. These efforts are not enough. There is a need to move away from end-of-pipe treatment.

Desired actions

Enhance linkages with sector-wise associations

Organize a workshop with sector-wise industrial associations, FICCI, CII, Regional Development Boards, and the Ministry of Industrial Development. The outcome of this workshop should be a plan of action for capacity building, specifically for

Priority: 1
Timeframe: 2 years
Key players: Ministry of Industries, FICCI, CII, SIDBI, EIA cell of MoEF, Sector wise industrial associations, Regional Development Boards, IDBI, SIDBI, NABARD, CEE Industries Initiative

a. Developing systems for equitable distribution of benefits with communities, arising out of use of traditional knowledge
b. Developing systems for environmentally sound cultivation and harvesting of biodiversity resources which are being used for large-scale production
c. Documentation of information on waste minimization; optimization of resource use; environmental impact with a bearing on resource quality; resilience of ecosystems; handling of hazardous wastes;
d. Development of comprehensive local databases to help integrate 'production' and 'protection'
e. Facilitating financing to small scale industry for cleaner production and waste minimization.
f. Examining the extraction and substitution process of resources, and how processes should be reworked to integrate biodiversity and livelihood concerns.

Awareness about EIA methodologies

Organize workshops for EIA consultants for orientation to biodiversity concerns.

Specific Occupational and Professional Groups

Armed Forces[1]

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 backgrounds, and a geographical spread that has presence in and access to environmentally significant and fragile areas, unapproachable by other groups.
- Control over large tracts of land, which contain significant biodiversity rich areas.
- Discipline and ethic not often found collectively in the civilian population.
- A comprehensive understanding of topography and aspects of geography related to biodiversity.

In the past few decades, several initiatives have been taken to enhance awareness of environmental issues among defence personnel, and for specific conservation work.

Awareness programmes have been taken up at the National Defence Academy, the Defence Services Staff College and several other units, through talks and slide shows, as well as through nature camps.

Units in several parts of the country have done tree plantations and reforestation work. At one of the stations, solar cookers/ ovens have been introduced for preparation of all bakery products. Families are also encouraged to use solar cookers during the nine months of sunshine and these have also been marketed at concessional rates through the divisional canteen.

The Eastern Army Command has instructed local artillery units to suspend firing on the ranges in the Torsa River area when the annual elephant migration takes place, to ensure safe passage to the herds. Army patrols in Bhuj have been instructed to report on the sighting of endangered species and to prevent disturbance by visitors to the nesting grounds of flamingos. Arrangements to carry fodder from the famous Bani grasslands in empty returning transport to prevent mass migration of cattle are under way and measures are being examined for better storage of rainwater during the monsoon.

The Army Environmental Cell organizes an annual three-day Army Environmental Meeting, attended by representatives from all five Army Commands, the Navy and Air Force, the Territorial Army, the Border Roads and the Ministry of Environment and Forests, and institutions such as the BNHS and WWF India.

Eco Task Force

The Ministry of Defence and the Ministry of Environment and Forests have initiated the Ecological Batallions (called Eco Task Force) of the Territorial Army which are working for environmental upgradation. The existing units are helping mitigate desertification in the degraded areas of the Himalayan foothills; between Dehra Dun and Mussoorie in the Siwalik hills; in the hills in the extreme northwest; and along the Ganga canal in Rajasthan. They have been successful in the construction of bunds and check dams; the prevention of soil erosion; the use of alternate means of renewable energy, including solar cookers and gobar (cow dung) gas plants; security; the introduction of anti-pollution measures, especially for water; creating environmental awareness among local people; and tree planting on a massive scale.

[1] Most examples on this page are from *The potential of the military in environmental protection: Indiaa* by Maj Gen Eustace D'Souza (retd), on www.fao.org/docrep/v7850e/V7850e12.htm

A voluntary and highly professional group, which can get involved in environmental activities in peace time, it is extremely well-equipped to undertake natural resource and biodiversity conservation initiatives. Since it is a very well organized sector, it is possible to introduce systemic environmental best practice in all cantonments and permanent installations, including water conservation, waste management, and greening using appropriate species.

A general awareness of the wildlife and biodiversity of India, in different ecosystems and biogeographic zones, hot spots of biodiversity, endangered species etc. would be of use and may in the long-term help in making biodiversity values one of the considerations in siting of defence installations. In biodiversity rich areas, individual units/ battalions can have a special role, which will have to be worked out, based on the region and the conservation imperatives there, such as reporting of sightings of wildlife, assistance in CITES related work in coordination with Wildlife Preservation, assistance in soil and water conservation measures on land outside defence installations, forestry.

The ex-servicemen wing can help personnel who are retiring to take up post-retirement activities such as 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.

A detailed planning exercise should be done jointly by Ministry of Environment and Forests and Ministry of Defence for developing the nature and scope of interventions and suitable training and orientation programmes at various levels.

Desired actions

Set up a joint services programme to evolve programmatic inputs, including required capacity building, in the following areas:

1. Recommendations and guidelines for all permanent defence installations to take up environmental best practices, such as those for greening using appropriate species of plants, energy and water conservation, water harvesting where appropriate, waste management.
2. Introducing modules on environment, and biodiversity (highlighting the role of the defence services) in induction and refresher courses for various levels.
3. Area specific interventions in critical biodiversity-rich areas, where the defence personnel can play an important role, in assistance in controlling poaching/ illegal trade, scientific monitoring and reporting, sightings, mountain conservation etc.

Priority: 1
Timeframe : 2 years
Key players: Ministry of Defence working with identified agencies of MoEF, WII, WWF India, BNHS, CEE, other agencies and individuals for specific technical inputs, ex-servicemen involved in conservation activities.

Mass media (print and television)

Some newspapers and television channels do have specific features and spots on environment related topics. This should be encouraged. Especially, success stories of conservation should be highlighted.

More important, there is a need to go beyond special 'environment beats', and analyze news on a regular and routine basis, for implications for sustainable development. This can happen when media owners and managers and journalists have an understanding of and commitment towards sustainable development.

Some constraints that working journalists face is lack of time to build up their understanding or attend training programmes etc.

Desired Actions

1. Conduct consultations with media owners and managers to help evolve policies towards responsible environmental reporting. [1]
2. 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. [1]
3. Develop distance, web-based, training and orientation programmes on environment and development issues for working journalists and free lancers, which can be paced as per individual requirements and time constraints. These long-distance programmes may also have contact internships with specific organizations in different cities.
4. Develop/ foster e-groups of environmental agencies and interested journalists to ensure speedy and accurate reporting of issues.
5. Promote and encourage investigative journalism on environment and biodiversity, and institute awards for outstanding work in this field.

Priority: 1
Timeframe : 1 year to initiate and ongoing
Key players: Press Institute of India, Indian Forum of Environmental Journalists, Centre for Media Studies, CEE, etc

Judiciary

The Judiciary needs to have access to relevant material including case-material to effectively interpret environmental legislations.

Desired Actions

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.

Priority: 2
Timeframe : 5 years
Key players:
NLSIU, WWF Centre for Environmental Law, Bar Council of India, ENVIS node for Environmental Law.

[1] Media and Biodiversity sub thematic draft BSAP

4. Arrange orientation and frequent refresher programmes for judges and lawyers.

Financial Institutions

Financial institutions which finance small, medium and large projects (industrial or otherwise) should be sensitive to possible impacts of projects on biodiversity. While most banks have their own training colleges, the centralized in-service training for the banking sector as a whole happens through Reserve Bank (Bankers' Training College, Bombay), Indian Banks Association (IBA) and National Institute of Bank Management (NIBM), Pune. A short course could be developed and offered regularly and as part of its existing programmes to sensitize personnel of financial institutions to environment and biodiversity concerns.

Priority: 1
Timeframe : 2 years
Key players: MoEF to work with Bankers' Training College, IBA, NIBM

Desired actions

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 funding large projects, industrial and rural development banks, and institutions supporting micro credit.

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.

Groups with special needs [1]

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. They too must be seen as consumers of natural resources, who have as much of an impact on the environment as any other group.

"Active participation in the community" or inclusion, is indeed the biggest challenge for people with disabilities today. There are signs of hope - inclusion is supported by law; there are examples where people with disabilities have been involved in environmental education events.

"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.

Article 23 of the UN Convention on the Rights of the Child, 1989, (which India has ratified) states that "State Parties recognize 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."

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.

People with disability could earn a livelihood through conservation/ environment related jobs. Options include 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

" 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, describing his experiences of conducting nature education sessions for pupils from the School for the Blind at Mumbai.

Caroline Casey, 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.theaislingproject.org)

[1] This section is excerted from a paper on *Environment Education and People with Disabilities* developed as part of the NBSAP process, by Sujata Padmanabhan, Kalpavriksh, Pune

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.

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.

for youth with disabilities. Around 25 youth are trained every year, after which most find employment. 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.

There are examples where 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. It is important for people with disabilities to be able to have a chance to contribute to their neighbourhood or community.

Environmental education efforts can help in facilitating inclusion. This needs to be done at various levels: with people working in the field of EE; with people working in the field of disabilities; with people in charge of public facilities to enhance accessibility.

Environmental educators need to be sensitized to be able to deal with people with disabilities, and to understand that in most cases, all that is required is sensitivity to some special needs that a group may have, and a realization that there is often a very thin dividing line between ability and disability.

People working in the field of disability need to be networked with environmental agencies, to build up an understanding of environmental issues, to evolve suitable EE programmes in the required formats, and ways of maintaining continuity for specific groups.

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, such as a flight of steps. Most parks, zoos and museums in our country have not considered the needs of disabled individuals in their planning and design. 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 realize 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.

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.

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.

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.

Linkages between environment issues and disability are sometimes apparent and sometimes not so clear:
Recent reports show the possible linkage between endosulphan spraying of cashew plantations in Kasargode district in Kerala and the increase in incidence of neurological disabilities.

The guideline of 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.

The students of Spastics Society of Northern India (SSNI), New Delhi. 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!"

Desired Actions

An overarching strategy to facilitate inclusion of people with disabilities into ongoing environmental education programmes is **collaboration** between groups working in the two fields.

Possible mechanisms for networking and raising awareness about environment and disability issues are:

1. Enhancing the scope of the National Green Corps

Priority: 1
Timeframe : 1 year
Key players: MoEF, state governments, NGC resource agencies, NGC nodal agencies

Schools for disabled children should be included in the scheme for the National Green Corps of the Ministry of Environment and Forests. Special educators should be included in the capacity building training for master trainers. At least a few schools for disabled children from each district should be part of the NGC.

2. Special module on disability and environment in the BEd. course

Priority: 2
Timeframe : 4 years
Key players: MHRD

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. A component on disability and environment in the BEd. course syllabus 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.

3. Developing and sharing of resources

Priority: 1
Timeframe : 2 years
Key players: MHRD EOSE, ENVIS Centre for EE.

Development of a set of basic resource materials would help give an impetus to EE for people with disabilities. This should include:

a. Material on perspectives and methods of EE for people with disabilities should be developed for the use of educators. This material should be widely disseminated among organistions and schools working in the field of disability, EE agencies, and mainstream educators.
b. Material to enhance awareness about environmental issues should be developed in formats (including both braille and audio) for the visually impaired, in at least a few Indian languages.

The process for development of such material should involve a workshop of educators, special educators, agencies who have had some experience of EE for children and adults with disabilities, etc

4. Enhancing participation in National Environmental Awareness Campaign (NEAC)

Priority: 1
Timeframe : 1 year
Key players: MoEF, NEAC RRAs, NGOs, Agencies working in the field of disabilities

The Ministry of Environment and Forests, should make a policy to involve and encourage agencies working in the field of disabilities to participate in NEAC. The Regional Resource Agencies can be asked to make a special effort to involve such organisations. An even greater impact would be achieved if EE for the disabled could be declared as one of the focal subjects or themes of the NEAC for one

year. Special material and guidelnes could be developed for the participating NGOs.

5. Linking to ongoing programmes/schemes

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. NGOs and citizens groups organising activities like outdoor camps and field visits, community level programmes or campaigns (for example, clean up drives or anti plastic campaigns), seminars etc should make a special effort to include groups that are not mainstream. Newsletters and websites on environment education should highlight experiences of where this has been done.

Priority: 1
Timeframe : 1 year
Key players: Nodal agencies for EE and NGO networks, agencies working in the field of disabilities.

6. Enhancing access to sites and information at sites such as zoos, museums, parks.

a Arrange workshops for managers of zoos, museums, parks etc showcasing the work done to enhance accessbility, as well as to discuss how such efforts can be enhanced.

b. This may be taken up by the CZA, by the BSI, ZSI, National Museum Institute.

Priority: 1
Timeframe : 1 year
Key players: Nodal agencies for EE and NGO networks, agencies working in the field of disabilities, CZA, BSI, ZSI, ICOM, National Museum Institute.

"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".

Sujata Padmanabhan, in the note on EE for People with Disabilities developed for the EATSAP.

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