

# Ashoka Trust for Research in Ecology and the Environment

## Report | 2001-2003



[www.atree.org](http://www.atree.org)

## Acknowledgements

Special thanks to Sharmila Srikanth, Suparna Biswas and the Team at ATREE who helped craft and produce this report

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*“One of the greatest challenges of conservation is preserving the incredible diversity of life while ensuring that people’s needs are respected and protected.”*

*-Henri Nsanjanama*

# ATREE

## *An Introduction*

In 1996, Ashoka Trust for Research in Ecology and the Environment (ATREE) was founded in an effort to address the environmental challenges facing India. ATREE is unique as it utilizes an interdisciplinary approach to address issues of environmental degradation and economic development. ATREE's efforts are focused on the Western Ghats and the Eastern Himalayas. These regions are considered hotspots for their extraordinarily diverse species of flora and fauna.

**Mission** Using principles of natural and social sciences, ATREE strives to conserve biodiversity and promote sustainable development while seeking to advance the protection of the environment.

**Strengths** Committed staff and their ideas. Creativity drives innovation and experience influences change.

**Strategies** As a catalyst for innovation and change, ATREE

- undertakes research, learning & action
- conducts education programmes
- impacts policy
- pursues effective outreach

**Stakeholders** Government, business, educational/research institutions & civil society

ATREE's activities in research, education, outreach and policy are integrated to achieve its main goals. These main components draw on and reinforce each other. The research forms the basis of our action, policy and outreach programs, and insights gained from outreach activities contribute to the development of research and educational programs. Educational programs draw upon the strength of the research program and pedagogical approaches developed in the educational programs contribute to outreach activities.



*Leaders are indispensable,  
but to produce a major  
social change many  
ordinary people must  
also be involved."*

*-Anne Firor Scott*



# Foreword

## ***Building and sustaining partnerships for conservation***

*The Ashoka Trust for Research in Ecology and the Environment, as it enters the seventh year of its operations, continues to draw upon its main strength - Learning. This is the basis of our actions on the ground, policy analyses, conservation education, and outreach to civil society. It is this learning which allows us to bridge the gap between conservation science and conservation policy; between economic well being of the rural communities and the ecological health of their surrounding ecosystems; and between conservation education and societal needs. And it is this learning that makes us realize the importance of building coalitions of interests and organizations to address common goals.*

*Consequently, many of ATREE's accomplishments during the last two years have resulted from alliances and networks that we have built to effectively address enormous conservation challenges we face. Working with like-minded individuals and organizations, we have initiated discussions to create a Western Ghats Forum to deal with issues beyond the capability of a single individual or organization. The Forum is likely to be launched in September 2003. At a smaller geographical scale, wherever ATREE operates, it has endeavored to build coalitions of organizations and stakeholders to nurture efforts to conserve natural capital and to build human and social capital. Through Conservation and Society, a recently launched interdisciplinary journal, ATREE is providing a platform for bringing together scholars and resource managers for discussion and debate of issues that link conservation and society.*

*Through productive partnerships, ATREE has implemented significant programs of national and international importance during the last two years. ATREE in association with the Wildlife Institute of India has undertaken the World Biodiversity Heritage Site program to develop a model for the management of protected areas to conserve India's natural heritage. Supported by the United Nations Foundation, UNESCO and the Ministry of Environmental Forests, the program seeks to build the capacity of managers to address contemporary challenges in conservation and to involve civil society in protection and management of biodiversity. ATREE's Millennium Ecosystem Assessment Program that involves a range of government and civil society stakeholders seeks to identify drivers of and societal responses to changes in ecosystem services during the last many years both in the Western Ghats and the Eastern Himalayas. In collaboration with Wildlife Conservation Society, ATREE is leading an effort to develop the profile of the Western Ghats- Sri Lanka hotspot which would provide strategic directions for grant making to a consortium of international conservation organizations led by Conservation International. In collaboration with the University of Agricultural Sciences, Bangalore, ATREE is involved in a major project on plants of India. Working with the Center for Interdisciplinary Studies in the Environment and Development and UNESCO, ATREE is seeking to improve watershed management in Karnataka.*

*Alliances and coalitions would become more important as ATREE enters the next phase of its growth. We anticipate continued progress in three critical areas. First, with the addition of several social scientists, ATREE's emphasis on interdisciplinary and integrated approach to the problems of conservation and development would increase. Second, again due to recent additions to our staff, ATREE's capability to measure its impact and to influence policy would increase. Third, because of the alliances we have built outside and the internal changes we have initiated within, our ability to respond to complex and large challenges such as poverty and environmental degradation, climate changes, and poor governance and ineffective policies would increase.*

*Our accomplishments described in the next few pages would not have been possible without the generous financial support from our donors. We are particularly grateful to the Ford Foundation, New Delhi and the Sehgal Family Foundation, New Delhi for providing endowment funds for long-term viability and sustainability of our programs. And we thank our numerous friends and colleagues for inspiration, encouragement, and support.*

*Kamal Bawa, President  
Ashoka Trust for Research in Ecology and the Environment  
Bangalore, India*



# Press & Photos Highlights 2001-2003

**ECOLOGY/EVOLUTION**  
**Biodiversity from Space**

**EDITORS' CHOICE**

Mapping and quantifying biodiversity is key to effective conservation planning, yet gathering the necessary data can be costly and time-consuming. Conservationists and land managers therefore place a premium on methods, such as remote sensing, that yield tolerable estimates of biodiversity in the absence of exhaustive ground surveys. Bawa et al. have tested a method of estimating tree diversity from space. Their study, conducted in the Biligiri Rangaswamy hills in the Western Ghats, India, shows a strong and positive correlation between species richness and an index of green biomass—the Normalized Difference Vegetation Index (NDVI)—which can be assessed accurately using satellite imagery. This technique shows promise for estimating broad patterns of tree species diversity at the landscape scale in tropical forests, which may be crucial to identifying areas most in need of protection and where rapid destruction is underway. — AMS

Cover, Ecol., 8, www.sciencemag.org/doi/10.1126/science.1101127 (2002)

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www.sciencemag.org SCIENCE VOL 299 17 JANUARY 2003



Prof. Bawa presenting Nandan Nilekani, CEO of Infosys with a copy of the C & F Journal

THE HINDU, Madras, June 9, 2003

## Butterfly Park to be ready next year

By the Staff Reporter

**MADRAS, ANDhra Pradesh** The Butterfly Park project to be set up at the Erode Wildlife National Park in the western of Bangalore will be ready in one year, K.K. Ganeshiah, a wildlife conservationist, said on the project, he said.

He said the park was part of an ambitious project that included a butterfly garden, research on butterflies as an ecological indicator, and sensitization of the public to protect butterflies through promotional activities.

"Butterfly is an indicator of the health of an ecosystem. Each butterfly has its own story of survival strategy. We also educate people about how nature works using this metaphor as a model," said Ganeshiah, who has been coordinating the project. He said butterfly was chosen as a "flagship" of the nation as it symbolized a specific microecosystem, as well as change in its numbers indicated change in ecology.

The Butterfly Park would have a "Butterfly Zone" housing 25 species of butterflies. "This zone will provide for breeding and availability of butterflies throughout the year," said the conservationist.

"The idea is to provide different nature habitats and to attract the various species of butterflies that are to be accommodated," said A.R.V. Rao, another scientist involved in the project. The park would have a "butterfly walk", housing up to 30 species of butterflies.

The landscape would be in the shape of a butterfly.

The project was estimated to cost Rs. 2.8 crore, with a major contribution from the Zoo Authority of Karnataka.

The project would be implemented in a phased manner in five years, with the total phase beginning next year.

A database on butterflies in Western Ghats covering their distribution, status of survival, and potential conservation strategies was expected to be ready by the time the project was completed. Educational activities under the project would be coordinated by Wildlife Trust for Research in Ecology and Environment (WIRE). They would include education for visitors, training programmes for teachers, organisations, and interested individuals, to help them set up their own butterfly parks.

Dr. Ganeshiah said the project was expected to provide additional income being sent to the Erode Wildlife National Park by raising dues to create butterfly and supply them to the park.

The project is a joint effort of the Forest Department, the Zoo Authority, the Department of Zoology, and the University of Agricultural Sciences, Bangalore.

DECCAN HERALD, TUESDAY, JUNE 10, 2003

## Eco-informatics workshop inaugurated

**Lit+News Service**

**BANGALORE** A two-day workshop on eco-informatics, a synergy between ecology and informatics, was inaugurated in the city today, resolved to promote application of information technology to ecology.

The workshop, being held here from June 8 to 11, will bring together professionals from the US and India with the tasks of exploring new methods in eco-informatics and imparting skills to Indian groups. It will also formulate institutional arrangements to promote research in this domain in the country.

The workshop is being sponsored by Ashok Trust for Research in Ecological and Environmental Studies, University of Agricultural Sciences, Bangalore. It is being headed by Indira Science and Technology Forum.

Introducing the workshop, Dr. Ramal Bawa of the University of Massachusetts, said the purpose of the workshop was to discuss the application of information technology to address environmental problems, particularly in the areas of biodiversity and sustainable development. "The programme would also undertake on the manner in which information could be compiled, analysed and disseminated," he added.

Saaya Sahaquai, a CEO of systems administration and network of firms in the Western Ghats watershed by Dr. A. M. Krishnaiah, vice chairman, IWR, Bangalore.

The IWR also has the envisage of the project to help conserve birds there. A new international journal by IWR, Conservation Society, dedicated to survey and projects of conserving natural resources, was also released.



Ms. Sheila Dixit, Hon. Chief Minister of Delhi releasing an Education CD



Prof. Ganeshiah speaking at the Ecoinformatics workshop



# RESEARCH

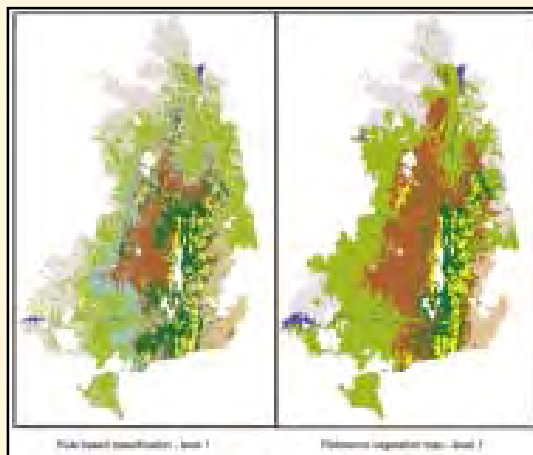
## *Laying Strong Foundations For Appropriate Interventions*

### CONSERVATION PLANNING

#### *Biodiversity from space*

Mapping and quantifying biodiversity is key to effective conservation planning, yet gathering the necessary data can be costly and time consuming. Conservationists and land managers therefore place a premium on methods, such as remote sensing, that yield tolerable estimates of biodiversity in the absence of exhaustive ground surveys. Bawa *et al.* have tested a method of estimating tree diversity from space. Their study, conducted in the Biligiri Rangaswamy hills in the Western Ghats, India, shows a strong and positive correlation between species richness and an index of green biomass – the Normalized Difference Vegetation Index (NDVI) – which can be assessed accurately using satellite imagery. This technique shows promise for estimating broad patterns of tree species diversity at the landscape scale in tropical forests, which may be crucial to identifying areas most in need of protection and where rapid destruction is underway.

Quote from the Editor's Choice Section, Science Vol 299 17 January 2003



#### *Assessment and planning for effective conservation*

The program in Conservation Planning at ATREE influences policy by providing key information about the distribution and status of biodiversity to the policy and decision makers using the latest technologies in Geographical Information System (GIS) and remote sensing.

The Millennium Ecosystem Assessment (MA) is an international process designed to meet the needs of decision makers and the public for scientific information concerning the consequences of ecosystem change for human well being, and options for responding to those changes. Leading scientists from more than 100 nations will conduct the assessment, with oversight by a board comprised of representatives of four international conventions, five United Nations agencies, international scientific organizations, and leaders from the private sector, non-governmental organizations, and indigenous groups. ATREE, in collaboration with Research and Action in Natural Wealth Administration, has recently become a part of the MA process to conduct an assessment of ecosystem goods and services, and their link with sustaining human livelihoods in the Western Ghats and the Eastern Himalayas, two of the global hotspots of biodiversity.

ATREE is pioneering in applying the tools of information technology to ecology and natural resource management in the emerging field of biodiversity informatics. ATREE has joined hands with University of Agricultural Sciences, Bangalore, the University of Massachusetts, Boston, and

the Missouri Botanical Garden Missouri in an effort to document plants of India in the form of electronically accessible numerical and spatial databases.

ATREE is leading an effort to develop a profile of the Western Ghats for a consortium of organizations that has provided support to Conservation International to initiate a major program to strengthen conservation efforts in biodiversity hotspots. The profile will be used as a strategic document by Conservation International to make grants for conservation in the Western Ghats.

ATREE in partnership with the Wildlife Institute of India under the aegis of the Ministry of Environment and Forests seeks to strengthen biodiversity conservation in protected areas (PAs) in general by building replicable models at existing and proposed UNESCO World Heritage Biodiversity Sites. It includes developing a comprehensive conservation management model involving all the stakeholders for two World Heritage sites in the northeast: the Kaziranga and Manas National Parks. In addition, a profile of new sites in the Western Ghats and Eastern Himalayas to be considered as future World Heritage Biodiversity sites would also be developed.

## Highlights

***Land use & Land cover Change*** ATREE's program on land use change assesses the extent of change in land cover, particularly deforestation and forest degradation, identifies the causes of change, and examines their consequences. It is concentrated in two regions: the Western Ghats and the Eastern Himalayas. Examined deforestation in post and pre-independence periods from historical records.

***Gap Analysis*** ATREE's has conducted gap analysis for the Western Ghats and the Eastern Himalayas. Beginning with a gap analysis for the Agastyamalai region, ATREE is now conducting gap analysis for the entire Western Ghats based on the distribution of biodiversity and the existing protected areas.

***Protected Area Management*** Effective management of protected areas requires assessment of biodiversity as well as documentation of potential threats to it. ATREE has undertaken an exercise for the Biligiri Rangaswamy Temple Wildlife Sanctuary (BRT WLS) in Karnataka, India. This approach is being extended to other protected areas throughout the Western Ghats so that the layer of threats can be overlaid on to the layer of biodiversity, to enable identification of "hotspots" that are threatened by human pressures, currently or in the future.

***Biodiversity Assessment & Mapping*** Mapping of biodiversity, threats to biodiversity and institutional/policy analyses is being done for the entire Western Ghats region with detailed micro-level studies at three sites in the Western Ghats and associated hills - Kalakad-Mudanthurai Tiger Reserve (KMTR), Tamil Nadu and the Biligiri Rangan (BR) and Malai Mahadeshwara (MM) hills in Karnataka. The distribution of Red-listed medicinal plants is being documented and mapped in the Charmadi-Kannapadi reserve forests of the Western ghats. In the case of bamboo, mapping is being undertaken at a local, regional and national level.

***Forests & Watershed Services*** ATREE along with its partners Centre for Inter-Disciplinary Studies in Environment and Development (CISED), UNESCO, National Institute of Hydrology and Karnataka Forest Department has initiated a multi-institutional, multi-disciplinary and stake-holder-linked research project that would examine the poorly understood link

between land-use/land-cover changes and watershed services at the local and regional scale in the Western Ghats region.

***Development of Tools & Techniques***

A technique to classify landscape heterogeneity using remotely sensed data is being developed. This technique will enable identification of localized hotspots of biodiversity embedded within a given area.

ATREE developed a sophisticated technique of classifying forests in ways that take into account the fact that they are not mosaics of discrete categories of vegetation types, but are a continuously changing terrain of biological diversity. ATREE is also experimenting with use of hybrid methods of vegetation mapping using combination of conventional supervised classification of original four bands and rule-based classification based on two-date Normalized Difference Vegetation Index (NDVI).

ATREE has developed a methodological framework for post fire detection and mapping fire in the different vegetation types of BRT WLS combining use of two-date remotely sensed NDVI data, a reference eco-climatic/vegetation map for stratification and stratified random training data from a detailed ground survey.

***Information to Advance Strategic Conservation Planning***



## CONSERVATION & LIVELIHOODS

### Community-based environmental stewardship

The Large Scale Adivasi Multi-Purpose Societies (LAMPS) were first set up by the Indian government in 1971, primarily as a vehicle for tribal development. The main activities are collection and marketing of NTFPs, distribution of rationed goods, sale of agricultural inputs and provision of credit to members. Membership is open to all adult tribals in a given taluk. With Vivekananda Girijan Kalyan Kendra (VGKK), ATREE has been involved in reform of LAMPS to make them more democratic and accountable to the tribals. A significant achievement of this cooperative effort has been a policy decision taken in recent general body meetings held in two (Yelandur and Hanur) of the three LAMPS societies with whom ATREE works, to raise the proportion of returns to the collectors to 75 percent, which is a marked improvement.



### Developing approaches that integrate conservation and livelihood security

The Conservation and Livelihoods Program is focused on meeting the twin goals of conservation and poverty reduction in areas that are rich in biodiversity. Although ATREE's Conservation and Livelihoods program is spread over several sites in the Western Ghats and Eastern Himalayas, two of the 25 global hotspots of biodiversity, the core activities that provide models for work elsewhere are being done at Biligiri Rangan Temple (BRT) Wildlife Sanctuary, Malai Mahadeshwara Hills, Kanakapura range in Karnataka, Kalakad Mundanthurai Tiger Reserve, Tamil Nadu and the Darjeeing hills of North West Bengal.

The purposes of ATREE's Conservation and Livelihood initiative are a) to provide economic incentives to local communities to conserve biodiversity, b) to promote sustainable use of non-timber forest products, and c) to develop appropriate institutional and policy frameworks to foster conservation and the well being of the local communities.

The activities include: a) bringing together various stakeholders such as tribals, the community based organizations, non-governmental organizations, the forest department and other government agencies to develop a comprehensive plan for conservation, poverty reduction and institutional reform, b) setting up community based microenterprises and developing alternate livelihoods to reduce dependence on wild forest products, c) initiating participatory appraisal of resources, impacts of harvest and benefits from conservation, d) creating awareness about environmental issues among local communities, local schools and forest department, e) empowering communities to plan and implement institutional reforms to sustain new activities and f) undertaking scientific and socioeconomic monitoring to assess the success of the Conservation and Livelihoods initiative in meeting twin goals of promoting conservation and enhancing rural livelihoods.

The outputs include: a) community managed micro-enterprises and self-help groups, b) improved agroforestry systems, c) reformed institutions, d) new policies, e) new models of integrated natural resource management and f) scientific and socioeconomic information, data, lessons and principles for conservation and sustainable use of biological resources.

### Highlights

#### ***Creating Alternate Livelihood Options***

ATREE in collaboration with Vivekananda Girijana Kalyana Kendra (VGKK), is assisting *Soligas*, the indigenous inhabitants of the BR Hills to conserve their natural resources through interventions which include: (a) setting up of *Soliga*-run enterprises



for the processing and value addition of NTFPs, especially of wild honey and fruits (b) improvement of agroforestry systems to enhance the productivity of agroecosystems and to decrease reliance on wild biological resources.

***Strengthening Institutions***

ATREE, in collaboration with the Darjeeling Earth Group, assisted communities in two villages to (a) set up micro-enterprises viz. cultivation of medicinal and horticultural plants, bee-keeping and animal husbandry (b) undertake preventative crop damage measures and (c) initiate new agro-forestry practices. In addition, ATREE has provided technical, managerial, and financial inputs to the village eco-development committees to enable the villagers to create alternate sources of livelihoods, thereby minimizing their dependence on forest resources.

ATREE has also strengthened village level institutions such as self-help groups and the village eco-development committees.

***Participatory Resource Monitoring Methodology (PRM)***

Initiated the PRM for non-timber forest products with the *Soligas*, the indigenous people of the Biligiri Rangaswamy Temple Wildlife Sanctuary. This was part of a larger effort to help *Soligas* derive economic returns through processing products they harvested and to develop models of conservation and sustainable use of forest resources. Similar efforts are being undertaken in the Eastern Himalayas.

***Participatory Resource Management***

ATREE in cooperation with the Orissa State Forest Department is undertaking a comparative study on strengths and weaknesses of alternative forest management systems under diverse administrative settings from a technical, ecological, social, economic and capacity building perspectives. The project would also investigate organizational and institutional imperatives to make the system an effective instrument for Sustainable Forest Management and Sustainable Rural Livelihood in the forest fringe villages.

***Participatory Research***

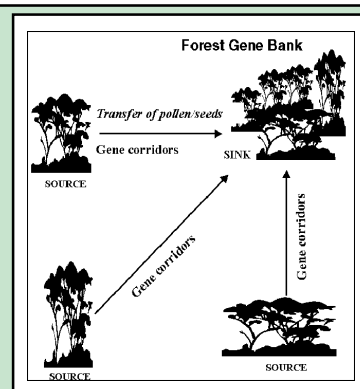
On-farm trials to improve farm yields and introduce multi-purpose indigenous trees are being conducted on *Soliga* farms with the active cooperation of *Soliga* farmers. The objective is to enhance alternate livelihood options so that pressure on forests in the form of extraction of non timber forest products is reduced. We have seen a three-fold increase in the numbers of farmers adopting improved techniques from the previous year. Beneficial results from such on-farm trials are readily apparent to farmers and the process of adoption is accelerated. Farmers 'own' the results and innovations. Improvement in soil productivity and yields will be monitored. Participatory research in this context not only impacts farmers, but also provides useful 'scientific' information for a wider audience.

***Enhancing Community Stewardship of Resources***



## CONSERVATION GENETICS

The Forest gene bank model has been developed for the conservation of forest tree genetic resources. This model combines the benefits of the conventional conservation approaches and is dynamic and evolutionary. They serve as an *in situ* repository of genes from as many diverse populations of species as possible to represent the widest spectrum of variability.



### ***Scientific research to formulate appropriate management strategies for the conservation of forest genetic resources***

ATREE's priorities in conservation genetics is to assess the status and threats to genetic resources, evaluate socio-economic causes and consequences of loss of genetic resources on livelihoods of the forest fringe communities and develop innovative strategies for the conservation of genetic resources at a regional level.

ATREE in collaboration with the University of Agricultural Sciences, Bangalore is involved in mapping the genetic diversity of critically endangered and economically important forest tree species of the Western Ghats and in developing models and strategies for the genetic enrichment and restoration of such species.

### **Highlights**

#### ***Mapping Genetic Diversity***

Using geographical information system tools and molecular markers, we have mapped and identified the "hot spots" of genetic variability of important forest species (eg. Sandal, bamboo, rattans, medicinal plants etc.) in south India and in the Western Ghats. These studies, perhaps the first in India, have provided rich insights to develop protocols for the *in situ* conservation of the genetic resources of economically important plant species.

#### ***Genetics of Small and Fragmented Populations***

We are characterizing and monitoring the genetic diversity of species with small and fragmented populations with a view to develop strategies for their conservation and restoration. Genetic diversity of species in sacred groves, shola forests and the Myristica swamps has been examined. An important finding from these studies is that, small fragments among themselves possess a higher level of genetic variability than do large fragments among themselves and thus underscore the need to conserve small fragments as well.

#### ***Impact Assessment***

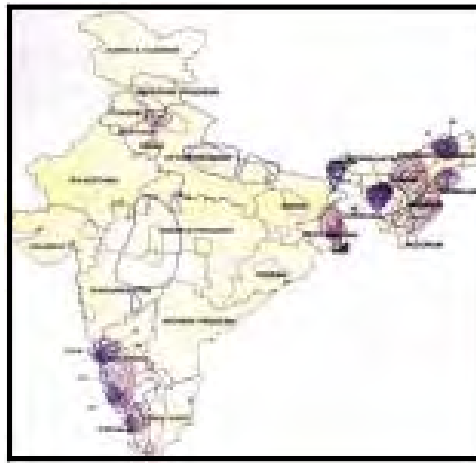
In collaboration with the Centre for International Forestry Research (CIFOR) and International Plant Genetic Resources Institute (IPGRI), ATREE helped assess the impact of anthropogenic pressures on the regeneration and genetic diversity of non-timber forest products (NTFP) at forest sites in south India. Human pressures in these forests were shown to genetically differentiate populations of NTFP species.

The utility of PAs in providing refuge for the conservation of genetic resources of important tree species (such as bamboo, rattans and sandal) was demonstrated in the protected area network of the Western Ghats.

**Models of Conservation of Genetic Resources** Several novel approaches to reach at cost-effective and comprehensive conservation goals have been made. In one approach, amalgamating the ecosystem-based approach with the species-based approach was found to constitute an efficient and cost-effective strategy while also addressing the conservation concerns of a larger body of species and at the regional level.

Forest gene banks have been proposed to serve as *in situ* repositories of genetic resources especially of species that are critically endangered and whose habitats are highly fragmented.

### Conserving Genes to Ecosystems



## CONSERVATION ECOLOGY & MANAGEMENT

ATREE's long-term interest is in the ecology and conservation of NTFPs in the Western Ghats and Eastern Himalayas. The subject of NTFPs is a global concern to environmentalists conservationists, and biologists particularly in the South Asia Region. Sufficient scientific evidence collected over the years, proves that indiscriminate harvesting and unfettered overexploitation of NTFPs has consequently lead to the depletion of irreplaceable forest resources. Long-term forest monitoring plots for the purpose of regeneration of NTFPs have been established recently. ATREE's biological and socio-economic research is being integrated to prepare a policy framework for sustainable use and management of NTFPs.



### *Advancing our understanding of ecological systems and their management*

Global changes, such as biodiversity loss, land-use and land-cover change, hydrological modification, the deliberate and inadvertent introductions of invasive species, and the alteration of global biogeochemical cycles, are predicted to interact with ongoing climate change to alter ecosystems in complex ways across a broad range of scales. A vision for conservation ecology and management has never been more relevant than it is today. From this stems the need for ATREE to position itself to manage ecological systems through a structured process of learning by doing.

### **Highlights**

#### ***Forests in a Changing World***

ATREE is part of a global network of forest dynamics plots coordinated by the Centre for Tropical Forest Science of the Smithsonian Tropical Research Institute. These 1-ha plots will provide insights into the regeneration of important species (e.g., select NTFP) in human-managed forests. These plots will also provide insights into the long-term patterns of forest dynamics (e.g., in response to climate change).

Temporal patterns of flowering and fruiting—or phenology—are an important indicator of resources available to a variety of forest insects, birds, and small mammals. Inter-annual variations in long-term phenology can also indicate climate change phenomena. ATREE's ongoing phenological studies in the wet forests of the Agastyamalai region of the southern Western Ghats, initiated in 1990, are the only such long-term phenological study of wet forests in India.

#### ***Impact of Anthropogenic Pressures***

Demographic models of important NTFP species have shown that destructive harvesting practices (e.g., branch lopping) and frequent fires negatively impact species populations. These results are being integrated with participatory approaches to develop better harvesting practices for sustainable use and management of NTFP.

Land use change is an important driver of biodiversity loss. Using litter insects as an index of biodiversity, ATREE's work along land-use gradients in the Western Ghats



has demonstrated that conversion to monoculture plantations may have the most deleterious impact on litter- biodiversity, when compared with other, traditional land-use practices such as community-managed 'sopinabettas,' and multi-species plantations. These results have implications to the productivity and nutrient turnover in these soils.

### ***Threats to Biodiversity***

Anthropogenic fires are perceived as one of the principal threats to biodiversity in dry tropical forests. ATREE is investigating the effects of fire on forest structure and composition at various scales, in an effort to enable better fire management: studies at the stand scale examine the vulnerability of different species to damage by fire; studies at the landscape scale examine the fire-susceptibility of different forest types to develop a predictive model of fire occurrence.

Invasive species are a growing threat to native biodiversity, worldwide. Lantana is one of the most widespread invasive species in India's dry forests. ATREE's preliminary results indicate that Lantana may be suppressing native species regeneration, with consequences for biodiversity, and human livelihoods, alike.

### ***Cataloging Diversity***

Most conservation efforts focus on large, charismatic mammals, even though insects account for most of the biodiversity on earth, not to mention the important role they play in ecosystem functioning. Species catalogues are the basis on which any discussion of biodiversity conservation must be based; yet our knowledge of insect diversity is woefully incomplete. ATREE is inventorying fig insects, dung beetles, ants, carabid beetles and parasitic wasps of the Western Ghats. ATREE is developing a user-friendly computer based key for the identification of ants in south India. We completed a seasonal multi-taxa inventory of the Nagarahole National Park and as a result a rare and endemic frog *Micrixalus nudis* was reported for the first time from Karnataka.

### ***Pollination Ecology***

Community level pollination studies have been done at a few sites in the world and ATREE's studies in Kakachi of Kalakad Mundanthurai Tiger Reserve are among them. The study was completed over a period of 8 years as a part of the long-term monitoring program at the site. Researchers at ATREE have also examined bee pollination of canopy trees in the wet forest. This study was the first attempt to assess canopy trees in India for research. Another area of investigation has been the role of certain floral or extra-floral structures in the reproductive success of the species

### ***Agro- ecosystems***

The diversity of uncultivated corridors in agricultural fields may influence the level of natural enemy guilds, subsequently reducing crop pests. The paddy-tree corridor mosaics of the Malnad region of the Western Ghats of Karnataka provide an appropriate land-use system to test the above hypothesis. ATREE is assessing the impact of stand simplification in natural tree-corridors and the effect of modern cultivation practices such as pesticide and fertilizer application on paddy pest and natural enemy guilds.

*Bridging the Gap Between Ecology and Resource Management*



# EDUCATION

## *Influencing Future Leaders for a Greener Tomorrow*

### *Building a larger constituency of support for conservation*

“We, at Sanskriti, appreciate the efforts made by ATREE towards promoting awareness and knowledge of the rich Indian biodiversity in young students. The environment outdoor learning programs organized for our students and the Bio-resources Camp organized by ATREE was a great learning exercise”. Ms Gowri Ishwaran, Principal, Sanskriti School, New Delhi.



### *Tapping stakeholder synergies to facilitate conservation of biological diversity through education and capacity building*

Rooted in its core research and scientific efforts, ATREE's conservation education program is evolving through consultative and participatory process. ATREE and its many collaborating institutions continuously work with schools/colleges designing and delivering innovative conservation education programs. The programs at ATREE are field oriented and hence have a special appeal to an increasingly diverse audience. ATREE's educational activities are being conducted from all of its three offices in Delhi, Bangalore and Bagdogra, which helps it to effectively incorporate regional dimensions enhancing the local acceptance and impact.

### **Highlights**

#### ***Short Courses***

ATREE held its fifth two-week course in Conservation Biology for graduate and post-graduate students in June this year in Bangalore and for the first time the course was also held in Bagdogra for students from the Northeastern parts of the country. The objective of these field-based courses is to make students familiar with principles and techniques of conservation biology. These courses attracted Indian students and students from neighboring countries such as Sri Lanka and Nepal.

ATREE organized three vacation courses for high school students on “Bioresources”. Two courses were organized at Bangalore (3 week each) and one at New Delhi (4 weeks). These courses aimed at highlighting to the participants (10<sup>th</sup> Class level) the linkages between human welfare and bio-resources in all their dimensions.

#### ***Outdoor Environment Learning Initiative (OELI)***

ATREE is collaborating with National Museum of Natural History (Min. of Env. and Forests, Govt. Of India) to design and launch OELI (as a part of ATREE's plaNETwork program). The objective is to promote activities that supplement curriculum-based learning and in-school environment education programs. OELI is offering structured outdoor environment learning modules for school children. These modules blend outdoor excitement with learning and exploration of natural processes. OELI was launched in the National Capital Region in August 2002 and has been very successful given the response from schools, number of participants and subsequent feedback. More than 1300 student participants enrolled for environmental learning modules conducted between August'02 to April'03 from

Delhi, Bangalore and Darjeeling. Most of these modules are residential, exposing them to biodiversity, conservation, and the sustainable use of natural resources. Some modules are specially designed for village schools.

In addition, ATREE Bangalore organized the following workshops: (a) workshop on insect diversity and conservation for undergraduate students and (b) workshop on surveying and monitoring honeybees for the senior and junior level researchers.

### ***Environmental Learning Facilities***

Under its plaNETwork program, ATREE has set up dedicated environmental learning facilities in various locations around the country. These facilities form the base for ATREE's outdoor learning programs under OELI. Three such facilities namely Churdhar Environmental Learning Facility (District Sirmaur, H.P.) and Aravali Environmental Learning Facility, (District Gurgaon, Haryana) and Western Ghats Environment Learning Facility (Biligiri Rangaswamy Temple Hills, District Chamrajanagar, Karnataka) are operational. Most recent addition has been the Alpine Environment Learning Facility adjacent to the Great Himalayan National Park in Kullu, H.P. More such facilities are being planned.

Under the Eastern Himalayan Program of ATREE, two Environment Education Resource Centers (EERC) are established in Kalimpong, Darjeeling. The EERC supports conservation education activities in local English and Nepali medium schools.

### ***Rural Environment Education Programs***

ATREE is networking with 72 schools in Kanakapura, Karnataka. Ten schools have participated in a hands-on environmental education program of raising seedlings of native tree species in their backyards and planting them in their school ground. One school has initiated a medicinal plant garden.

ATREE used folk drama as a tool to bring about social and environmental change, as it is a traditionally accepted medium for communicating stories and traditions. A full-length drama written and directed by a Soliga youth, performed by Soligas were staged in all the settlements in the (BR Hills). Lyrics were written and adapted to folk music by a Soliga music group. This drama touched on environmental and social issues pertinent to the hill folks. The response from the community was spontaneous and people gathered in relatively large numbers to watch the shows. Sonap have since been aired on the local radio.

ATREE formed a "Pasumai padai" (= green brigade) in 2 villages near Kalakad Mundanthurai Tiger Reserve (KMTR), Regular contact programs on various themes were organized. The brigade took a resolution to safeguard the colony from poaching. Staff at the Kalakad Mundanthurai Tiger Reserve (KMTR) field site have developed two slide shows on the ecological services of bats and pond ecosystems.

### ***Resource and Curriculum Materials***

ATREE collaborated with Department of Environment, Government of Delhi to bring out a CD Pack and Monographs titled "Key Environmental Concerns of Delhi". The CD was officially released by Ms. Sheila Dixit, Hon'ble Chief Minister of Delhi on 25 May, 2003. ATREE has made available 500 copies of the CD-ROM for distribution to schools and resident welfare associations in Delhi by the Department of Environment.

Green Minds, a manual of activity-oriented modules with locally relevant examples based on six different themes for teachers in English and Nepali was produced. Coordinated by ATREE's Eastern Himalayan Program, the manual has six themes: environmental concepts, nature study, alternate energy, pollution, waste management, and green consumerism.



A film titled “The Final Frontier” highlighting the history and role of (PA) network in India with specific reference to Asola Bhatti Wildlife Sanctuary in Delhi was released by the Chief Minister of Delhi on 1 August 2003. It focuses on the problems and prospects of the PA in India. It delves upon the livelihood conflicts that impact upon management of PAs for biodiversity conservation.

### ***Teacher Training and Orientation***

ATREE is working closely with Government of Delhi in programs aiming at enhancing the capacity of schoolteachers to lead conservation education activities in the schools of Delhi. Apart from numerous training sessions/lectures in schools, ATREE and Department of Environment, Government of Delhi also collaborated to organize a 3-day residential training program for schoolteachers on Outdoor Environmental Learning Techniques. Conducted at Churdhar Facility in Himachal Pradesh, the program had participants drawn from various schools of Delhi.

ATREE in association with The Hindu, an National English newspaper organized a day-long Teacher’s Workshop on Challenges and Opportunities to integrate hands-on EE modules in schools. This workshop is part of a ongoing participatory approach to produce a teacher-friendly EE handbook for Bangalore schools.

Teachers from Kanakapura and Biligiri Rangan Hills were taken on a 2-day exposure trip to observe the dry-land watershed development program of BAIF Institute for Rural Development (K). This program integrates water and soil conservation with agro-forestry and micro-enterprise related activities through women self-help groups.

In Kalimpong, District Darjeeling, ATREE helped create a joint forum of 22 schools called the People for Environmental Awareness, Kalimpong (PEAK). With ATREE’s support, PEAK works at developing curriculum materials and training programs to enhance the quality of environment education in this ecologically critical area .

### ***Enhancing the Educational Potential of Protected Area (PA) Network***

ATREE is working to enhance the educational potential of Protected Area (PA) network and channelize this potential into meaningful programs and activities aimed at different sections of the society, especially students. ATREE Bangalore organized a study tour to Nagarahole National Park, Sringeri and Kudremukh National Park for postgraduate students.

ATREE is currently implementing the Asola Conservation Education Program to enhance the educational potential of Asola Bhatti Wildlife Sanctuary (the only PA in the city of Delhi). It involves development of nature trails, a mini interpretation center and an audio- visual presentation room at Asola. In addition, the program focuses training of schoolteachers in outdoor environment learning techniques and several other related activities. The project will benefit a large number of school students and other visitors to Asola Bhatti Wildlife Sanctuary.

ATREE and Biodiversity Conservation Society (BioDCS), Govt. of Himachal Pradesh have signed an MoU to initiate educational programs for school children at the Great Himalayan National Park (GHNP) in Himachal Pradesh. BioDCS is responsible for the management of GHNP.

ATREE has a formalized arrangement to conduct educational activities at Padmaja Naidu Zoological Garden (Darjeeling, West Bengal) and Bannerghata National Park (Karnataka).

*Influencing Tomorrow's Leaders*



# OUTREACH

## *Building Capacity and Fostering Networks*

### *Conservation by substitution - Using Lantana instead of Bamboo*

Bamboo resources are scarce in the vicinity of the Male Mahadeswara Hills due to natural and anthropogenic pressures. The alarming reduction of wild populations of Bamboo demands immediate mitigation measures. One of our approaches is to train the local communities in the use of Lantana instead of bamboo and develop rural and urban markets for these products. Lantana products will carry a conservation/livelihood label to reach urban consumers whom we hope will replace plastic with Lantana dustbins. Expert Lantana artisans from the neighboring states of Andhra Pradesh and Tamil Nadu have trained the *Soligas* in this skill. These communities have been using Lantana for several years because of the loss of bamboo in their localities. Conservation by substitution using Lantana could potentially reduce the pressure on wild bamboo and provide an alternate source of livelihood to poor and marginal communities.



### *Networking and partnerships for integrated natural resource management*

ATREE extends its outreach through strategic partnerships that foster collaboration and networking efforts and build capacity among institutions with different work cultures, scientific approaches and priorities. ATREE's capacity building efforts provide unique paradigms designed to empower local communities and to develop their skills. ATREE works closely with the government agencies as well to assist them in their efforts to enhance their institutional and human capacities for integrating environmental considerations into development planning and decision-making. The forums that ATREE creates bring like-minded organizations together to identify priorities for sustainable development action, to undertake joint research, and to engage other stakeholders in developing workable solutions.

### **Highlights**

***Catalyzing Partnerships*** ATREE is responsible for the education and outreach activities associated with the first ever Butterfly park of its kind in India. The Butterfly park is a collaborative effort between the University of Agricultural Sciences, The Zoo Authority of Karnataka, The Karnataka Forest Department and ATREE and is funded by the Department of Biotechnology and the Karnataka Government.

ATREE convened the Fifth National Consultation of the Conservation and Livelihoods Network. A regional consultation on 'Conservation and Community Enterprises' was organized by ATREE in partnership with Community Center for Development and BAIF Institute for Rural Development (K). The consultation was structured around farmer-led case studies followed by thematic presentations from resource persons highlighting various aspects of the conservation and development interface. This is a key step in the process of bridging the widening gulf between conservation and development practitioners.

ATREE has signed Memorandum of Understanding (MoUs) for its partnerships with a number of institutions listed in section Donor and Partner Organizations.

ATREE works with State Forest departments, Department of Biotechnology, Department of Science and Technology, Government of Delhi and the Ministry of Environment and Forests within the Government of India.

***Building Capacity to Empower***

ATREE is working with local communities to build capacity in conserving natural resources and enhancing rural incomes in the Western Ghats and Eastern Himalayas under various projects. Promotion of sustainable agro-forestry in Biligiri Rangaswamy Temple Hills is undertaken through demonstration/experimental units set up in the farmer's fields. ATREE complements these activities by growing seedlings of native NTFPS species through decentralized nurseries for on-and-off farm uses. ATREE promotes conservation-friendly appropriate technology to increase incomes of poor forest-dependent communities through training programs and workshops. ATREE works towards reducing wild fuel wood and fodder dependency through the promotion of multi-purpose plants in and around households in the villages in the Kalakad Mundanthurai Tiger Reserve region. In the Eastern Himalayan region, ATREE is linking environmental education with small-scale-enterprise oriented conservation.

ATREE is involved in strengthening institutions with whom they work in Western Ghats and Eastern Himalayas. Directors of Large Scale Adivasi Multi-Purpose Societies (LAMPS) were trained to enable them to play a significant role in the functioning of LAMPS. In Eastern Himalayas, ATREE supports the Eco-Development Committee set up by the State Forest Departments providing financial and technical assistance. In addition, ATREE enhances the capacity building of local NGOs.

In the year 2000, the Ministry of Environment and Forests (MoEF) initiated a project for the preparation of a National Biodiversity Strategy and Action Plan (NBSAP). The project aims to document biodiversity-related information at various levels, including distribution of endemic and endangered species and site-specific threats to and pressures on natural resources. ATREE staff serve on NBSAP's core steering committees for Sikkim, Arunachal Pradesh, and the North-East Eco-region. In addition, ATREE has contributed two theme papers, one on Customary Law and Biodiversity, and the other on Participatory Resource Monitoring, for the national technical core group.

ATREE is committed to promoting grassroots institutions that represent and provide an equitable stake for women in natural resource management. In order to pursue this goal, ATREE has initiated self-help groups in project areas and are in the process of linking them with appropriate viable micro-enterprises. The focus is on natural resource-based enterprises and capacity building for sustainable stewardship of these resources. This initiative is in collaboration with the Covenant Center for Development (CCD) at Madurai.

***Networking for Change***

ATREE awarded subscription grants to 45 meritorious Indian scientists to provide access to the latest information in conservation science. All 45 were given a 1-year subscription to *Conservation and Society*. In addition, 10 of these scientists were selected for a 1-year subscription to *Biotropica*, and 8 were selected for a 1-year subscription to *Conservation Biology*. ATREE believes that access to quality information will catalyze good research in conservation science.

ATREE is pioneering in applying the tools of information technology to ecology and natural resource management in an emerging field called eco-informatics. Recently, ATREE organized a 3-day workshop sponsored by the Indo-United States Science & Technology Forum (Department of Science and Technology) to bring



together experts from the US and India to exchange information on eco-informatics and develop a national program for India. A significant outcome of the workshop is the setting up of a national working group on eco-informatics and the release of a user-friendly CD on the Plants of the Western Ghats.

ATREE brings out an International Journal - Conservation and Society ([www.conservationandsociety.org](http://www.conservationandsociety.org)). The journal is a path breaking peer-reviewed journal committed to bridging the gulf between the natural and social sciences in the environmental sphere. It has an international Editorial Board and is published by SAGE Publications, New Delhi

ATREE ensures that most of its projects provide the opportunity for stakeholders to interact with each other and with institutions working with them. In the Western Ghats, such informal forums for interaction exist for projects undertaken in Biligiri Hills, Malai Mahadeshwara Hills and Kalakad Mundanthurai Tiger Reserve. Such informal forums are complemented by short-duration workshops. For example, ATREE conducted a half-day awareness workshop for villagers with the cooperation of the panchayat, on issues related to conservation and development.

The Western Ghats Forum, is a multi-organizational forum bringing government agencies, universities, non-governmental organizations (NGOs), (CBOs), and industry together to address research, action and policy needs of this complex biodiversity hotspot. The forum will serve as a “think tank” and help facilitate an integrated approach to issues concerning this diverse bioregion. The forum will be officially launched later this year at a conference on ‘Western Ghats: Conservation and Human Welfare’.

### *Strategic Partnerships and Building Capacities of Communities.*





# POLICY

## *Improving the prospects for lasting change*

### *Exploring policy alternatives*

Non-timber forest products (NTFPs) working plans, cess and certification – Extracting NTFPs provide a significant means of livelihoods to marginal communities but it also impacts forest ecosystems. Emerging from our field research, we are undertaking a policy-oriented initiative - dialogue and research on three focal issues. First, a dialogue to develop sound working plans for NTFPs for its sustainable management. Secondly, at the implementation level, a NTFP cess with earmarked funds for conservation needs and for local communities to manage their resources is being proposed. Thirdly, a certification process is being developed, that is meant to enable the consumer to distinguish between products on the basis of desirable measures of environmental and social “quality”. Certification of NTFPs is seen as a significant market-based intervention to ensure sustainable management practices, analogous to certifying timber and in agriculture as an incentive for organic farming.



### ***Advance public debate on strategies aimed at conservation and natural resource management***

ATREE's work in the policy arena is done by interfacing the high-quality research in natural science with policy perspectives, practical policy advice, and policy-focused dissemination of results, and debate. The policy research agenda addresses key global environmental policy questions- biological diversity and sustainability. To achieve its goals, ATREE brings together different constituencies to identify and design the agenda. The policy dialogue activities entail holding of seminars, conferences and workshops at the local, regional, national and international levels.

Policy analysis on issues vital to sustainable development of developing economies undertaken by ATREE helps people and governments to be at the forefront of development in a challenging world. During the last two years, ATREE increasingly engaged in policy dialogue, working to influence policy in the interests of the rural poor, improving governance and civic state relations through interactive dialogue processes.

### **Highlights**

#### *Policy Analysis*

The Millennium Ecosystem Assessment is a global program designed to meet the needs of policy makers and civil society on consequences of ecosystem changes, potential future scenarios, and options for better ecosystem management. ATREE, in collaboration with a number of partner organizations, is conducting an assessment of ecosystem goods and services in the Western Ghats and Eastern Himalayas. This is a multi-scale, integrated assessment, designed to look at changes in ecosystem goods and services and their consequences for human well-being. This assessment provides an opportunity to a) collect base-line data to document patterns and drivers of change and to monitor future changes, b) evaluate institutional arrangements for the prudent use of ecosystem goods and services, c) inform and assist policy and decision makers in the conservation and management

of biological resources, d) create an awareness about the ongoing changes in ecosystems and the consequences of such change, and e) outline mitigation strategies or response options to counter the deleterious effects of contemporary and impending changes.

A comprehensive natural resources management program is being undertaken in the Western Ghats by integrating conservation, livelihoods and awareness. It aims to strengthen local institutions, promote prudent use of biological resources through provision of economic incentives, and influence policies governing management of biological resources.

The Workshop on Policies, Management, Utilization and Conservation of Non-Timber Forest Products in the South Asia Region was co-organized by ATREE Bangalore and the Forestry Research Program for Asia and the Pacific (FORSPA), Food and Agricultural Organization, Bangkok to address a global challenge with a regional focus. Sufficient scientific evidence collected over the years, proves that indiscriminate harvesting and unfettered overexploitation of non-timber forest products (NTFPs) has consequently lead to the depletion of irreplaceable forest resources. The main objective was to generate a list of recommendations on policy, management, utilization and conservation of NTFPs, to promote conservation and sustainable resource use and enhance rural livelihoods.

### *Policy Impact*

The Regional Director of ATREE's Eastern Himalayan Program is one of the seven-member steering committee for the formulation of the Assam Forest Policy 2003.

In the Eastern Himalayas, ATREE's substantive work on imparting leadership training to teachers and students is recognized. ATREE's contributions in the field of conservation and livelihoods are being drawn for the preparation of the Assam Forest Policy 2003. In the Western Ghats region, specifically in the BR hills, VGKK and ATREE have helped bring more transparency to the LAMP societies, and their efforts have resulted in the elimination of lease fees for NTFPs. In the National Capital Region, ATREE sustained its efforts to work with educational institutions and establish the need for quality conservation education programs which link curriculums with the natural world around us

At the national level, ATREE's substantive work on databases has started to influence science policy in biodiversity databases for conservation and management of biodiversity.

### *Policy Dialogue*

The Millennium Ecosystem Assessment involves a dialogue process designed to meet the needs of civil society. ATREE staff are contributing to this process as elaborated above.

ATREE organized two workshops, one each at Manas and Kaziranga for the project on World Heritage Biodiversity sites. The objective was to assess the research needs to enhance the maintenance of biodiversity, outlined plans for capacity building of professional staff at all levels, and discussed strategies to improve communication with local communities and to bring benefits to conservation to villagers around the parks. They also made recommendations for policy review and governance reforms aimed at effective management of PAs. ATREE is also studying the feasibility of habitat connectivity in the Kaziranga and Manas national parks.

## *Humane Policies for a Sustainable Future*



# PUBLICATIONS

## BOOKS

Ganeshaiyah, K.N. and Uma Shaanker, R. (2003), *A Decade of Diversity*, Bangalore: ATREE and University of Agricultural Sciences.

Shivanna, K.R.. (2003), *Pollen Biology and Biotechnology*. New Hampshire, USA: Science Publishers. (Indian Edition - New Delhi: Oxford-IBH Publishing Co. Ltd).

## ARTICLES IN PROFESSIONAL JOURNALS AND BOOKS

### Biodiversity and Conservation

Ganesan, R. (2003). 'Identification, distribution and conservation of *Phyllanthus indofischeri*, another source of Indian gooseberry', *Current Science*, 84: 1515-1518.

Murali, K.S., Kavitha, A. and Harish, H.P. (2003). 'Spatial patterns of tree and shrub species diversity in Savanadurga State Forest, Karnataka', *Current science*, 84: 808-813.

Bawa, K.S., Rose, J., Ganeshaiyah, K.N., Kiran, M.C., Barve, N., Kiran, M.C. and Uma Shaanker, R. (2002), 'Assessing Biodiversity from Space: An example from the Western Ghats, India', *Conservation Ecology*, 6(2): 7. (Online) URL [http://www.consecol.org/vol\\_6/iss2/art\\_7](http://www.consecol.org/vol_6/iss2/art_7).

Chettri, N. (2002). 'Impact of tourism on biodiversity: A case study from the Sikkim Himalayas, India', in A.P. Krishnan, P.D. Rai and J. Subba (eds), *South Asian Perspectives in Eco-tourism and Conservation*, pp. 157-169, Gangtok, India: ECOSS.

Davidar, P., Yoganand, K., Ganesh, T. and Devy, M.S. (2002). 'Distribution of forest birds and butterflies in the Andaman Islands, Bay of Bengal; nested patterns and processes', *Ecography*, 25: 5-16.

Talukdar, B.K. (2002). 'Dedication leads to reduced rhino poaching in Assam in recent years', *Pachyderm*, 33: 58-63.

Bawa, K.S., Rose, J., Ganeshaiyah, K.N., Kiran, M.C., Barve, N. and Uma Shaanker, R. (2001), 'Mapping biodiversity from the sky', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 523-525. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Davidar, P., Yoganand, K. and Ganesh, T. (2001), 'Distribution of forest birds in the Andaman Islands: importance of key habitats', *Journal of Biogeography*, 28: 663-636.

Ganeshaiyah, K.N., Uma Shaanker, R., Barve, N., Kiran, M.C. and Bawa, K.S. (2001). 'A regional approach for the conservation of the biological diversity of the Western Ghats', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 552-556, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Lele, S., Srinivasan, V. and Bawa, K.S. (2001), 'Returns to investment in conservation: Disaggregated benefit-cost analysis of the creation of wildlife sanctuary', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 31-33. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Priyadarsanan, D. R., Ganeshaiyah, K.N., Uma Shaanker, R., Mushtak Ali, T.M., Kumar, A.R.V. and Chandrashekara, K. (2001), 'Impact of human-induced disturbance on the diversity of dung beetles (Coleoptera: Scarabaeidae) and ants (Hymenoptera: Formicidae)', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 129-132. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Rastogi, A. and Chettri, N. (2001). 'Extended biodiversity 'hotspot' analysis: A case of Eastern Himalayan region, India' in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 622-628. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.



Seidler, R. and Bawa, K.S. (2001). 'Logged forests', in S. Levin, (ed), *Encyclopedia of Biodiversity Volume 3*, pp. 747-759, New York: Academic Press.

Ganesan, R., Ganesh, T., Devy, M.S., and Davidar, P., 'Regeneration dynamics of a wet evergreen forest, southern Western Ghats, India', Pages 231-234 (in press).

#### ***Land Use and Land Cover Change***

Chettri, N., Sharma, E., Deb, D.C. and Sundriyal, R.C., (2002). 'Effect of firewood extraction on tree structure, regeneration, and woody biomass productivity in a trekking corridor of the Sikkim Himalaya', *Mountain Research and Development*, 22: 150-158.

Badrinarayanan, S., Krishnaswamy, J., Lele, S. and Chandrashekara, K. (2001). 'Consequence of forest conversion to coffee plantations on litter beetle and ant communities', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 162-166, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Ganeshaiyah, K.N., Shivaraj, B., Barve, N., Kiran, M.C. and Uma Shaanker R. (2001). 'Mapping forests based on their biological diversity to identify the conservation sites: a case study from Udupi and South Canara districts of Karnataka', *Journal of Indian Institute of Science*, 80: 531-536.

#### ***Non-Timber Forest Products and Human Use of Forests***

Sinha, A., and Bawa, K.S. (2002). 'Harvesting techniques, hemiparasites and fruit production in two non timber forest tree species in south India', *Forest Ecology and Management*, 168: 289-30.

Prasad, S., Chellam, R. and Krishnaswamy, J. (2001). 'Fruit removal patterns and dispersal of *Emblica officinalis* (Euphorbiaceae) at Rajaji National Park, India' in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 513-516, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Setty Siddappa, R., Bawa, K.S. and Bommaiah, J. (2001). 'Participatory resource monitoring for non-timber forest products in Biligiri Rangaswamy Temple wildlife sanctuary, Karnataka, India', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 85-88, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Sinha, A. and Bawa, K.S. (2001). 'Impacts of anthropogenic pressures on population dynamics, demography, and sustainable use of forest species in the Western Ghats, India', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 101-103, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

#### ***Conservation Ecology and Management***

Kelsey, R.G. and Joseph, G. (2003). 'Ethanol in ponderosa pine as an indicator of physiological injury from fire and its relationship to secondary beetles', *Can. J. For. Res.*, 33:870-884.

Aravind, N.A., Barve, N., Uma Shaanker, R., Poulsen, J. and Ganeshaiyah, K. N. (2002). 'Mapping human induced threat to a Sanctuary, India', *ETFRN News*, 36:41-43.

Hiremath, A.J., Ewel, J.J. and Cole, T.G. (2002). 'Nutrient use efficiency in three fast-growing tropical trees', *Forest Science*, 48: 662-672.

Hiremath, A.J., Ewel, J.J. and Cole, T.G. (2002). 'Productivity, nutrient retention, and nutrient use efficiency in three fast-growing tropical trees', *Forest Science*, 48: 662-672.

Talukdar, B.K. (2002). 'Tiger Predation of Rhino Calves at Kaziranga National Park, Assam', *Tiger Paper*, 29: 18-20

Aravind, N.A., Rao, D., Vanaraj, G., Poulsen, J., Uma Shaanker, R. and Ganeshaiyah, K.N. (2001). 'Anthropogenic pressures in a tropical forest ecosystem in Western Ghats, India: Are they sustainable?',



in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 125-128, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Murali, K.S. and Setty Siddappa, R. (2001). 'Effect of weeds lantana camara and chromelina odorata growth on the species diversity, regeneration and stem density of tree and shrub layer in BRT sanctuary', *Current Science*, 80: 675-678.

Sinha, B., Ramakrishnan, P.S., Bhadauria, T., Saxena, K.G. and Maikhuri, R.K. (2003). 'Impact of landscape modification on earthworm diversity in Hariyali sacred landscape, Garhwal Himalaya', *Pedobiologia*, 47 (Accepted).

### **Ecological Restoration and Agro-Ecosystems**

Hiremath, A.J. and Ewel, J.J. (2001). 'Diversity and ecosystem functioning in managed tropical communities', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 465-468, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

### **Forest Genetic Resources**

Ravikanth, G., Uma Shaanker, R. and Ganeshaiyah, K.N. (2002). 'Identification of hot spots of species richness and genetic variability in rattans - an approach using GIS and molecular tools', *Plant Genetic Resources Newsletter*, 132: 17-21.

Ganeshaiyah, K.N., Uma Shaanker, R., Barve, N., Kiran, M.C., Bawa, K.S. and Ramanatha Rao, V. (2002). 'In Situ conservation of forest genetic resources at regional level: Two complementary programs using GIS approach', in Engels, J.M.M., Ramanatha Rao, V., Brown, A.H.D. and Jackson, M.T. (eds), *Managing Plant Genetic Diversity*, pp. 413-423, Wallingford, Oxon, UK: CABI Pub.

Rao Nageswara, M., Anuradha, M., Ganeshaiyah, K.N. and Uma Shaanker, R. (2001). 'Protected areas as refuges for genetic resource: Are sandal genetic resources safe in our sanctuaries?' in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 121-124, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

### **Pollination, Dispersal and Behavioural Ecology**

Devy, M.S. and Davidar, P. (2003). 'Pollination systems of trees in Kakachi, a mid-elevation wet evergreen forest in Western Ghats, India. *American Journal of Botany*, 90(4): 650-657.

Devy, M.S. and Livingstone, C. (2001). 'Interactions between social bees and their food plants in a rainforest canopy of Western Ghats, India', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 420-422, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

Ganesh, T., Devy, M.S. and Davidar, P. (2001). 'Pollination and fruit dispersal in the wet forests of the southern Western Ghats', in K.N. Ganeshaiyah, R. Uma Shaanker and K.S. Bawa (eds), *Tropical Ecosystems: Structure, Diversity and Human welfare*, pp. 363-365, New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd.

### **CD's**

Ganeshaiyah, K.N. (2003). 'Sasya Sahyadri-Distribution, Taxonomy and Diversity of Plants of Western Ghats' ATREE and University of Agricultural Sciences.

### **AWARDS:**

Dr. K. Shivanna - INSA Senior Scientist (from Indian National Science Academy, New Delhi) - 2003-2005.

Dr. Harini Nagendra has been selected as an associate member of the Indian Academy of Sciences – 2003-2008.

### POPULAR ARTICLES

- Srinivasan, K. and Ramesh Kannan (2003), 'A weed in need', *Deccan Herald*, June 22.
- Uma Shaanker, R. and Srinivasan, K. (2003), 'Native Knowledge', *Articulations, Deccan Herald*, January 12.
- Ganesan, R. and Das, J. (2001), 'Save the nelli', *Times of India, Bangalore Times*, November 26: pp. 3.
- Priyadarshanan, D.R. (2001), 'Care a fig', *Deccan Herald*, October 30.
- Uma Shaanker, R. Ganeshiah, K.N. Meera, C. and Anuradha, H.R. (2001), 'Bamboo Bazaar', *Spectrum, Deccan Herald*, April 07.
- Vanaraj, G. (2001), 'The beneficial killer', *Deccan Herald*, September 25.
- Vanaraj, G. (2001). 'Safe terrain', *Deccan Herald*, November 23.

### MANUALS

- Setty Siddappa, R. (2002), *Manual on Sustainable Harvest of Non-timber Forest Products and Participatory Resource Mapping - Kannada* (Local language).

### REPORTS

- Panini, D. (2001), *Legal Aspects of Community Fund Management: a case study of JFM in eight states*. New Delhi: Ecotech Services

## Influencing the way we think



### **SEMINARS/WORKSHOPS/CONFERENCES 2003**

1. Ganesh, T. and Devy, M.S. 'Disturbance and compensatory pollination: do bats matter?-A case study from India' at the Association for Tropical Biology Conference. July 7-10, 2003. Aberdeen.
2. Joyeeta Das. 'Conservation Education' to US Consulate, Chennai at ATREE office on July 10, 2003
3. Barve, N. 'Use of GIS/RS in prioritizing the conservation sites' at the Conservation Biology Workshop. 20, June 2003. Bangalore, Karnataka.
4. Purushothaman, S. 'Economic Valuation of Biodiversity' at the Conservation Biology Course. 19, June 2003. Bangalore. Karnataka.
5. Purushothaman, S. 'Economics of Land Use options in a Degraded Dry Deciduous Area' at the research and training workshop of South Asian Network for Development and Environmental Economics (SANDEE). 8-15, June 2003. Waikkal. Sri Lanka.
6. Krishnaswamy J, Bawa K. S., Ganeshaiah, K. N. 'Bridging the Ground and the Sky: Merging Datasets from Satellites to Ecosystem to Landscape Elements for Conservation Ecology' at the Eco-informatics Workshop. 9, June 2003. Bangalore. Karnataka.
7. Barve, N., Devy, M. S. and Ganeshaiah, K. N. 'Mining Datasets: Addressing Conservation Concerns' at the Eco-informatics Workshop. June 10, 2003. Bangalore, Karnataka.
8. Kavitha, A. and Joseph, G. 'Greening rural schools: Environmental education Kanakapura, Bangalore rural district, Karnataka' at the National Seminar on Ecorestoration Biodiversity Conservation and Sustainable Development. June 3-5, 2003. Visakapatnam, Andhra Pradesh.
9. Raghunandan, K. L. and Joseph, G. 'Potential to Improve Seedling Quality in Restoration Efforts Using Newer Techniques' at the National Seminar on Ecorestoration Biodiversity Conservation and Sustainable Development. 3-5, June 2003. Visakapatnam, Andhra Pradesh.
10. Ramesh Kannan, H., Uma Shaanker, R. and Joseph, G. 'Conservation by substitution: Utilizing lantana as a substitute to bamboo' presented at National Seminar on Ecorestoration Biodiversity Conservation and Sustainable Development. 3-5, June 2003. Visakapatnam, Andhra Pradesh.
11. Talukdar, B. K. delivered a lecture on "Wildlife Trade in North East India" at Kaziranga National Park at the Legal Workshop organised by the Bar Council of India Trust and National School of Law. 25, March 2003. Bangalore, Karnataka.
12. Talukdar, B. K. delivered two lectures to the State Forest Service Officers from different states of North East India. 27, February and 7, March 2003. Burnihat, Assam.
13. Joyeeta Das. 'Conservation Education and Bioresources' to Poorna School, Gear Foundation, Frank Anthony Public School, Vidya Niketan School, Bishop Cotton Girls High School, Mallya Aditi International School, Shishu Griha School in the months of June/ July 2003. Bangalore, Karnataka.
14. Setty Siddappa, R. and Bawa, K. S. 'Non-timber forest products harvest techniques used in BRT Wildlife sanctuary Karnataka' at Kerala Forest Research Institute. 28-30, May 2003. Peechi. Kerala.
15. Shivanna, K. R. 'Biotechnological approaches to transfer genes across species limits' (two lectures), at the Department of Applied Botany and Biotechnology, University of Mysore, Under the UGC Faculty Improvement Programme. 21-22, May 2003. Mysore, Karnataka.

16. Shivanna, K. R. 'Collection, conservation and utilization of wild relatives of crop species', at ATREE's Vocation Training Programme on Bioresources for High School Students. 12, May 2003. Bangalore, Karnataka.
17. Priyadarsanan, D. R. 'An introduction to the Insect diversity:' at Mysore University Regional Centre. 7, May 2003. Hassan. Karnataka.
18. Setty Siddappa, R. Bawa, K. S. and Made Gowda, C. 'Conservation of Non-timber forest products with community involvement at B R T Wildlife sanctuary Karnataka' at workshop on Policies, Management, Utilization and Conservation of Non-Timber Forest Products in the South Asia Region. 28-30, April 2003. Bangalore. Karnataka.
19. Priyadarsanan, D. R. 'Insects: should they be conserved?' Academic staff college, University of Calicut. March 2003. Calicut. Kerala.
20. Setty Siddappa, R. and Bawa, K. S. 'Conservation of non-timber forest products with special reference to Participatory Resource Monitoring' at Moolike Utsav 2003. 8-10, March 2003. Dharwad. Karnataka.
21. Setty Siddappa, R. and Bawa, K. S. 'Conservation of non-timber forest products with special reference to Participatory Resource Monitoring' at Moolike Utsav 2003. 8-10, March 2003. Dharwad, Karnataka.
22. Anuradha, H. R., Uma Shaanker, R. Ganeshiah, K. N. and Srinivasan, K. (presenting author) 'Socio-economic causes and consequences of loss of bamboo and rattan resources in Western Ghats of Karnataka, India', National Symposium on Conservation, Management and Utilization of Bamboo and Rattan Resources. 25-27, February 2003. Department of Silviculture, College of Forestry, Sirsi, University of Agricultural Sciences – Dharwad, Karnataka.
23. Talukdar, B. K. delivered a lecture on the 'Wildlife Conservation and Challenges in North East India' at the National Legal Workshop organised by Bar Council of India and Bar Council of India Trust. 23, December 2002. Guwahati, Assam.
24. Chettri, N. 'Ecotourism: Concept, Implementation and Impact Assessment- A Case Study from Sikkim'. 23, November 2002. Gangtok, Sikkim.
25. Chettri, N. attended the 2<sup>nd</sup> Encounter of World Mountain People. Organized by World Mountain Peoples Association. 17-20, September 2002. Quito. Equador.
26. Chettri, N. participated in a brain storming workshop, as a follow-up to the NBSAP process. Organized by the United Nations Development Programme - Delhi. 6-8, August 2002. New Delhi.
27. Talukdar, B. K. and Chettri, N. attended a workshop on Forests and Forest Communities on 10, May 2002 in Siliguri, West Bengal. Dr. Talukdar presented a keynote lecture on the same topic.

## **STAFF AND ASSOCIATES**

### **Program Staff**

1. Kamaljit S Bawa, Honorary Senior Fellow
2. R. Uma Shaanker, Honorary Senior Fellow
3. K. N. Ganeshaiah, Honorary Senior Fellow
4. Ankila Hiremath, Fellow
5. Jagdish Krishnaswamy, Fellow
6. Soubadra Devy, Fellow
7. T Ganesh, Fellow
8. Priyadarsanan Dharma Rajan, Fellow
9. R Ganesan, Fellow
10. Bhaskar Sinha, Fellow
11. G S Mohan, Fellow
12. Kartik Shanker, Fellow
13. Seema Purushothaman, Fellow
14. Harini Nagendra, Fellow (Adjunct)
15. Mohammed Irfan Ullah, Fellow
16. Devaki Panini, Outreach and Policy Coordinator
17. Aravind N A, Senior Research Associate
18. Narayani Barve, Senior Research Associate
19. Arundhati Das, Senior Research Associate
20. Preethi Mony, Senior Research Associate
21. Kiran M, Senior Research Associate
22. R. Siddappa Setty, Senior Research Associate
23. Joyeeta Das, Program Officer
24. Nirvana Pradhan, Program Officer
25. Bipin Charles S, Research Associate
26. C Made Gowda, Research Associate
27. Sham Dhavande, Research Associate
28. Kavitha A, Research Associate
29. G Vanaraj, Research Associate
30. Ramesh Kannan, Research Associate
31. Santosh Kumar Rai, Research Associate
32. Raghu H B, Research Associate
33. Ragunandan K L, Research Associate
34. Anuradha Ravi, Research Associate
35. C D Nandita, Research Associate
36. Srinivasan K, Research Associate
37. Vasantha Kumari H L, Junior Research Fellow



### ***Research Associates (Projects)***

1. Vishal Mehta (Ph.D student, Cornell University)
2. Milind Bunyan
3. Merry Zacharias
4. K.V. Suma
5. Johan Solomon
6. Sheetal Patil
7. Bharath Sundaram
8. Nilima Nath

### ***Honorary Faculty***

#### ***Senior Fellows***

1. Dr. G.K.Veeresh - Ex-Vice Chancellor of University of Agricultural Sciences
2. Mr. A.S.Gill - Director, Procurement Operations Asia M/s KIIT US –Eugene, Oregon, USA, retired Vice President, Marketing & Exports, BBTC – (a plantation)
3. Dr. K.R.Shivanna - Head, Department of Botany (Retired), University of Delhi.
4. Dr. K.D Singh - Adjunct Professor at the Biology Department of University of Massachusetts, Boston.
5. Dr. K.P.S.Chauhan – Ex. Additional Director, Ministry of Environment & Forests, N. Delhi.
6. Dr. S.M.Nair - Programme Director, Centre for Environment Education, N. Delhi.

#### ***Fellows***

7. Dr. R. Vasudeva - Assistant Professor, Department of Forest Biology and Tree Improvement, College of Forestry, Sirsi University of Agricultural Sciences, Dharwad
8. Dr. Prabhakar - Strand Genomics, Bangalore and a visiting faculty at the Institute of Rural Management, Anand, Gujarat.
9. Dr. Ghazala Shahabuddin - Conservation Consultant.
10. Dr. Uma Shankar- Reader in Botany at North-Eastern Hill University, Shillong.
11. Mr. Gopa Kumar Menon – Director NAVGATI, a HR Training and Consulting Company, Bangalore.
12. Dr. Sunita Pradhan – Scientific Officer, Padmaja Naidu Himalayan Zoological Park, Darjeeling
13. Dr. Kushalappa - Associate Professor, Department of Forest Biology and Wildlife, College of Forestry, Ponnampet, University of Agricultural Sciences, Bangalore.
14. Mr. Nadarajan – Executive Director, Covenant Center for Development, Madurai.
15. Dr. Vasant K. Saberwal – Director of Research with Moving Images and Executive Editor, Conservation & Society, New Delhi.

#### ***Executive Staff***

1. Gladwin Joseph, Director, ATREE, Bangalore
2. Suparna Biswas, Assistant Director, ATREE, Bangalore
3. Manoj Dabas, Regional Director, North
4. Bibhab Talukdar, Regional Director, Eastern Himalayas

#### ***Administration and Finance***

1. T R Gopi, Senior Accountant
2. Shiva Subramanya S., System Administrator
3. N Ramesh, Office Executive

4. Hema Padmini, Executive Secretary cum Librarian
5. Kavitha M, Accountant
6. Manjula S, Program Executive
7. Bhogaiah, Office Executive
8. Apurba Saha, Administrative cum Financial Officer, Eastern Himalayas
9. Nishat Rehman, Office Executive, Eastern Himalayas

#### *Support Staff*

1. Binod Dubey, Driver, Eastern Himalayas
2. Jadeswamy, Driver, Biligiri Rangan (BR) Hills
3. Jadeya, Field Assistant, BR Hills
4. Kethe Gowda, Field Assistant, BR Hills
5. Kethe Gowda D, Field Assistant, BR Hills
6. Kumbha, Field Assistant, BR Hills
7. Laxmikantha G, Driver, Bangalore
8. Laxmikanthaiah N, Office Assistant, Bangalore
9. Madeva R, Driver, BR Hills
10. Madha, Office Assistant, BR Hills
11. Madhesha, Field Assistant, MM Hills
12. Nanje Gowda S, Field Assistant, B R Hills
13. Narayanamma, House Keeper, Bangalore
14. Neelaiah, Field Assistant, MM Hills
15. Rajanna D, Caretaker, BR Hills
16. Ramesh Kumar, Field Assistant, Kalakad Mundanthurai Tiger Reserve (KMTR)
17. Renuka, House Keeper, BR Hills
18. Sunil, Driver, Bangalore
19. Veera Badra, Field Assistant, MM Hills
20. Brij Mohan Saini, Office Assistant, New Delhi

#### *Student Interns*

1. Anand Iyer, Indian Institute of Technology-Roorkee
2. Nishikant Gupta, Indian Institute of Technology-Roorkee
3. Rashmi Kulkarni, Abasaheb Garware College, Pune
4. Paul Jennings, Imperial College, University of London, United Kingdom
5. Eléonore Martin, Agronomy major, ENSAIA (Engineering school), France

## *DONORS AND PARTNER ORGANIZATIONS*

### *Funding Partners*

1. Alcoa Foundation, Philadelphia
2. Australian Agency for International Development (AUSAID), New Delhi, India
3. Bay Foundation, New York, United States of America
4. Conservation, Food and Health Foundation, Boston, United States of America
5. Department of Bio Technology, Government of India, New Delhi, India
6. Department of Science and Technology, Government of India, New Delhi, India
7. Educational Foundation of America, United States of America
8. Food and Agriculture Organization, FORSPA-Bangkok, Thailand
1. Foundation for Revitalization for Local Health Tradition, Bangalore, India
2. Department of Environment, Government of NCT Delhi, India
3. Indian National Science Academy, New Delhi, India
4. Indo-US Science and Technology Forum, New Delhi, India
5. International Foundation for Science, Sweden
6. International Plant Genetic Resources Institute (IPGRI), Malaysia
16. Millennium Ecosystem Assessment, Penang, Malaysia
17. Ministry of Environment and Forests, Government of India, New Delhi, India
18. National Agriculture Technology Program (NATP), New Delhi, India
19. National Geographic Society, Washington, United States of America
20. Royal Norwegian Embassy, New Delhi, India
21. Resources for the Future, Washington DC, United States of America
22. Sehgal Family Foundation, New Delhi, India
23. Sir Dorabji Tata Trust, Mumbai, India
24. The British High Commission, New Delhi, India
24. The Ford Foundation, New Delhi, India
25. United Nations Educational Scientific and Cultural Organization (UNESCO), New Delhi, India
26. Wildlife Conservation Society's India Program, New Delhi, India
27. Wildlife Institute of India, Dehradun, India
28. World Food Programme, New Delhi, India

### *Collaborators*

1. Baif Institute for Rural Development (K), Tiptur, Karnataka, India
2. Center for Interdisciplinary Studies in Environment and Development, Bangalore, India
3. Covenant Center for Development, Madurai, India
4. Foundation for Revitalisation of Local Health Traditions, Bangalore, India
5. Green Foundation, Thalli, Tamil Nadu and Bangalore, India.
6. Institute for Social and Economic Change, Bangalore, India
7. National Museum for Natural History, Ministry of Environment and Forests, Government of India, New Delhi, India
8. Soliga Abhivrudhi Sangha, Chamrajanagar and Kollegal Districts, India
9. Sri Biligiri Soliga Kiru Aranya Utpadana Samskara Sangha, Biligiri Rangan Hills, India
10. The Karnataka Forest Department, Bangalore, India
11. The Tamil Nadu Forest Department, Chennai, India
12. University of Agricultural Sciences, Bangalore
13. University of Massachusetts, Boston, United States of America
14. Vivekananda Girijana Kalyana Kendra, Biligiri Ranagan Hills, India
15. West Bengal Forest Development Corporation, Kalimpong, India
16. West Bengal Forest Department, Darjeeling, India.
17. Assam Forest Department, Guwahati, India
18. Darjeeling Earth Group, Darjeeling, India
19. Biodiversity Conservation Society, Government of Himachal Pradesh, Kullu, India
20. Society for Scientific Advancement of Hill and Rural Areas (SAHARA), Kullu, India

**ASHOKA TRUST FOR RESEARCH IN ECOLOGY AND THE ENVIRONMENT(ATREE)**

No.659, 5th 'A' Main Road, Hebbal,Bangalore -560024

**RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31st MARCH 2003**

<i>Receipts</i>	<i>Amount (Rs.)</i>	<i>Payments</i>	<i>Amount (Rs.)</i>
<u>To Opening Balance</u>		<u>By Project Payments</u>	
Cash and bank	3400902	Aditi International School	44509
Fixed Deposits	14601291	Advocacy & Communication Workshop	50922
		ATB conference travel	339232
Corpus Donations		AusAid	4632
Suri Sehgal Family Foundation	4793750	British High Commission project	273784
Atree Boston	2381488	Critical Ecosystems Partnership Fund	6300
Dr. T.N. Khoshoo Memorial Fund	237187	Center for International Forestry Research	40559
Ford Endowment	24876542	Department of Biotechnology	368516
		Delhi Camp	359535
Receipts from Projects		Sir Dorabiji Tata Trust	1749764
Aditi International School	62900	Department of Science and Technology	265562
Advocacy & Communication Workshop	60000	Educational Foundation of America	1801250
ATB Conference	337560	FAO-NITFP Workshop	118829
Australian Agency for International Development (AusAid)	1452600	IPGRI	86379
British High Commission	455640	FORD Endowment grant	71186
Educational Foundation of America	13000	Foundation for Revitalization of Local Health Traditions	288829
Department of Biotechnology	829124	GIR Foundation Fund	4982
Delhi school programs	430075	Govt. of Delhi (Slide Pack Project)	57098
Sir Dorabiji Tata Trust	2400000	International Development Research Centre	475173
Department of Science & Technology	125000	International Foundation for Science	278523
Food and Agricultural Organisation of the United Nations - NTFP, Italy	286805	Indian National Science of Academy	250
Food and Agricultural Organisation of the United Nations, Thailand - NTFP Workshop	240800	Indian Society for Ecological Economics	29891
Foundation for Revitalisation of Local Health Traditions, Bangalore	300000	Millenium Ecosystem Assessment Project	773077
GIR Foundation Fund	6600	The Karnataka Forest Department Nagarhole project	467764
Government of Delhi	64657	Ministry of Environment and Forests (I)	408337
International Development Research Centre, New Delhi	96116	National Agriculture Technology Program	586098
International Foundation for Science, Sweden	1061129	New Ford Integrated Forest Management	19070809
Indian National Science of Academy, New Delhi	50000	National Geographic Society	263584
Indian Society for Ecological Economics (CISED)	125260	NORAD - Royal Norwegian Embassy	1505489
International Plant Genetic Resource Institute -Rome (IPGRI)	1016358	Plant Database project	1539615
Millinium Assessment Project (MEA)	1081566	Resources for the Future	256927
The Karnataka Forest Department	356923	Srilanka forest officials tour	199399
Ministry of Environment and Forests (I)	573800	University of Agricultural Science, Bangalore	8864
National Agriculture Technology Program (ICAR)	813977	UNESCO-Watershed	159879
The Ford Foundation	11378349	World Biodiversity Heritage	731981
National Geographic Society	639996	World Food Programme	21344
NORAD - Royal Norwegian Embassy	3262488	Winrock International	176262
Suri Sehgal Family Foundation-Documenting Plant Diversity	2075203	WYE MM hills project	310141
Resources for the Future, Washington DC	221973	Centre for Environment and Education Project	79332
Srilanka Forest Department	470875		
UNESCO-Watershed	944680	Duties & taxes	1980
UNESCO-UNF Foundation projects - World Heritage	355952	Sundry Creditors	20981
World Food Programme on behalf of world bank	142500	ATREE Fixed Assets	3219994
Biodiversity Programme			
WYE college	370651	Advances	46478
Project Serve	15000	ATREE Expenses	774967
Centre for Environment and Education Project	54289	Vehicle payment	35460
Centre for Wildlife Studies	20000		
Statutory Liabilities	77243	Closing Balance of:	
Reduction in Advances	978453	Cash	79387
Interest	160733	Cash in Bank	3533805
		Fixed Deposits	42711777
	<b>83699434</b>		<b>83699434</b>

Place : Bangalore  
Date : July 15, 2003As per our Report of Even Date  
for **G.ANANTHA & Company,**  
Chartered Accountants**(Gladwin Joseph)**  
Director, ATREE**T.R. Gopi**  
Senior Accountant, ATREE**(Rekha.K.R)**  
Partner