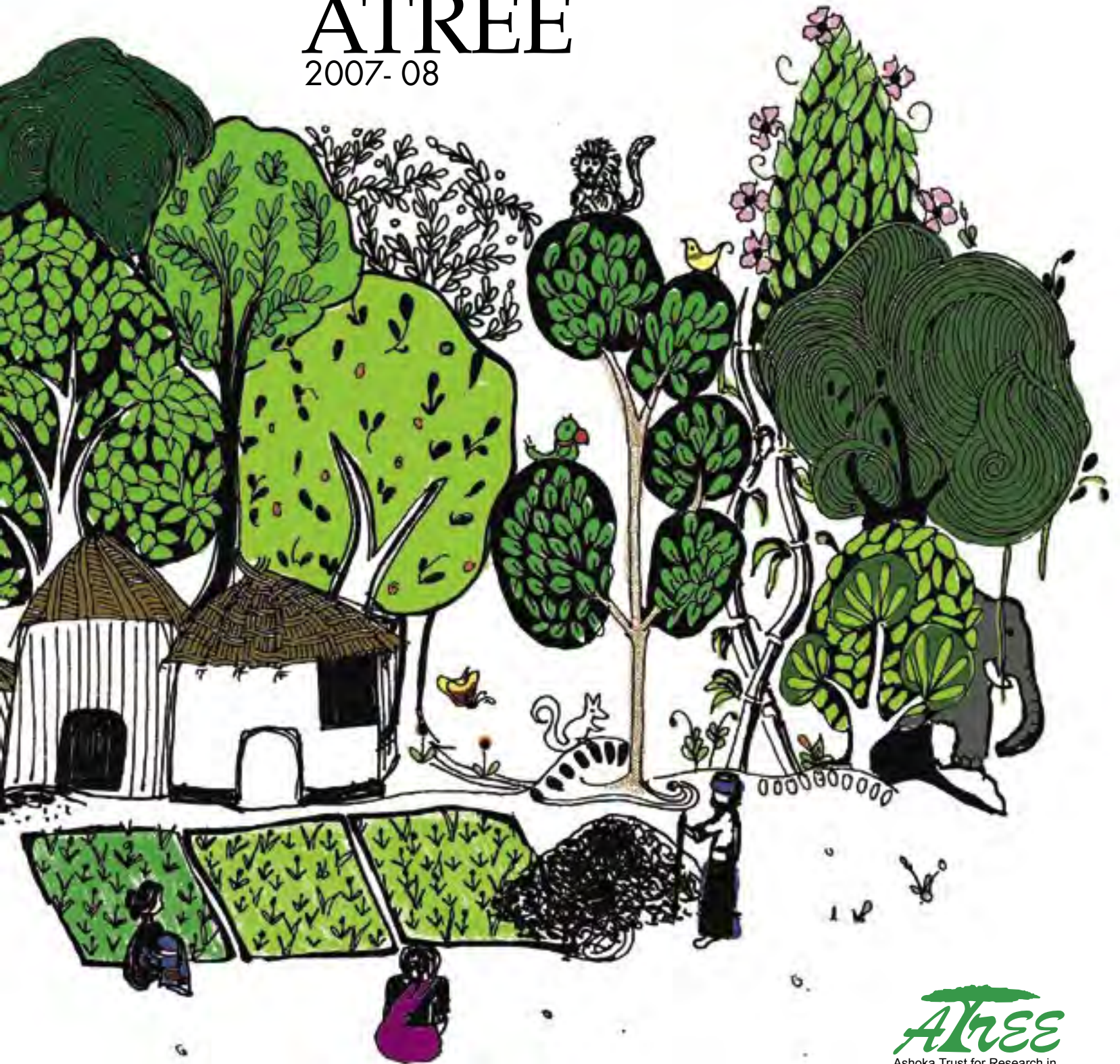


annual report  
**ATREE**  
2007- 08





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# foreword

## meeting the challenges of environmental change

The ongoing economic crisis may fundamentally alter the way society has treated the environment, and climate change may further accelerate this shift in attitudes and assumptions concerning growth. Environmentalists have been warning for quite some time that current patterns of consumption and growth are unsustainable and unjust, and yet we continue to function as if neither consumption nor environmental resources have limits. Clearly, as we move forward, efforts to translate sustainability – an abstract concept – to something tangible and concrete, in all spheres of economy and the environment, will become increasingly important.

ATREE is well poised to meet new environmental challenges that have conservation, sustainability and environmental justice as key concepts. Last year, our vision to create an Academy for Conservation Science and Sustainability Studies became a reality. The Academy that brings together all teaching and training activities at ATREE, and our other programmes are now housed in new premises, a ‘green’ building to be certified by LEED. The Academy goal is to produce a new generation of leaders who can think and act broadly to meet multidimensional and complex environmental challenges.

ATREE’s new strategic plan, to be completed by the middle of 2009, again emphasizes the need to meet challenges arising from changes in biodiversity, ecosystem services, and climate, and challenges of environmentally sustainable development, including decentralized governance. The plan also calls for changes in ATREE’s own governance and administrative structures to establish accountability and responsibility at all levels.

Among the many activities of ATREE described in this report, I wish to briefly point out ATREE’s expanding programme in the northeast that is of utmost importance for the country’s environmental security and that is undergoing rapid environmental change in three interrelated areas: biodiversity, climate and water resources. During the last year, we have identified key geographical and thematic areas for expanding our work, and built relationships with both local communities and organizations with similar goals to become more effective.

I would like to conclude with an expression of gratitude to our many donors. We are also very grateful to our numerous supporters and friends who contribute to our achievements in many ways. We look forward to their continued support, friendship and guidance.

Kamaljit S. Bawa  
President, ATREE

## from the director's desk

It has been a year of transitions for us at ATREE. The team at Bangalore moved to an airy, green office building at Jakkur. The new building is designed to foster community and that it does well. We also saw a change in leadership both at Bangalore and at Delhi regional offices. As requested by the Board I am back as director in my second stint and look forward to working with my colleagues to strengthen governance, build our programmes and above all nurture our human resources to make ATREE a world class institution. I would like to see our research cut across disciplinary boundaries, across traditional and modern epistemologies, and make long-term impacts on the ground; our educational initiatives change the way we think about the environment; and our targeted actions set benchmarks that are replicable. We know we cannot do it by ourselves – we strongly believe in collaborating, cooperating and synergizing with like-minded institutions and individuals to bring about desirable change.

I would like to highlight a few significant achievements of last year. ATREE played a lead role in a consortium of partners in developing and launching the India Biodiversity Portal (IBP) under the aegis of the National Knowledge Commission. The IBP is designed for, and depends on, the active participation of concerned and interested citizens from around the country and the world. We are proud to be recognized as a Centre of Excellence in Conservation Science by the Ministry of Environment and Forests (MoEF). There are only nine such centres in India and we are one among them. ATREE was recognized by the Stanford Social Innovation Review as a globally unique conservation organization for its pioneering work in crossing diverse sectors and linking sound research with strategic action as exemplified by our cross-cutting work at BRT Wildlife Sanctuary and Vembanad. ATREE, in collaboration with Nature Conservation Foundation and Wildlife Institute of India, provided the scientific basis for the MoEF proposed World Natural Heritage site clusters in the Western Ghats. Currently, ATREE is working with the Forest Department and civil society networks in Assam to strengthen effective management of existing World Natural Heritage sites at Manas and Kaziranga.

An exciting new development is the stated merger of CISED (Centre for Interdisciplinary Studies in Environment and Development) and ATREE in 2009, with which our intellectual resources to cope with environment and development challenges will increase substantially. CISED faculty brings tremendous strengths in interdisciplinary studies, and in management of water and other natural resources. We look forward to working with CISED faculty and board members, starting in 2009.

Gladwin Joseph  
Director, ATREE



New ATREE headquarters at Bangalore. Naturally well lit and well ventilated, the building is built around a landscaped courtyard where people can interact.

## the challenge

India, like many other countries of the world, is facing a national environmental crisis of huge magnitude. Our wild heritage is disappearing, our cities are getting increasingly polluted – exposing our population to serious health hazards, our land is being degraded – with severe consequences for agricultural productivity and livelihoods, and resources such as water are becoming scarce everywhere, threatening our social and economic well-being. Climate change has further exacerbated this crisis of the environment and the socio-economic problems related to it.

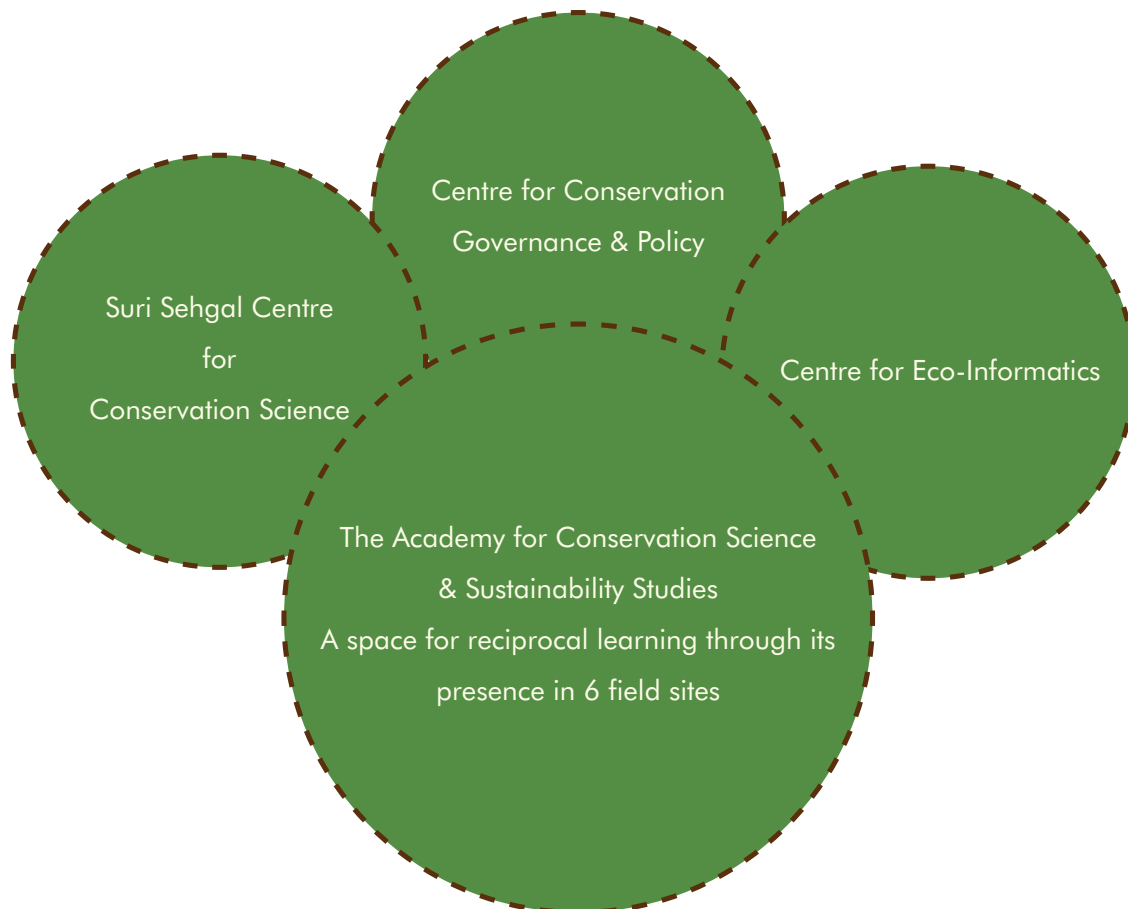
India is also witnessing rapid economic growth. Since the goods and services provided by natural ecosystems are the basis of all human endeavours, economic growth cannot be sustained without protecting the environment. The most pressing challenge for the country today is to maintain, and even enhance, the recent high rate of economic growth, while building a just and sustainable society, preserving our natural heritage, and protecting the environment.

The Ashoka Trust for Research in Ecology and the Environment (ATREE) was founded to address the environmental, social and economic dimensions of India's decline in natural resources. Since its inception, ATREE has sought to:

- Generate new knowledge that can be applied to curtail the decline in biological diversity and to foster sustainable development
- Improve policies and governance for the management of natural resources and protection of the environment
- Develop social and human capital to address contemporary environmental challenges
- Engage civil society in protection and management of environment and biological diversity

## integrated centres & academies for research, learning & interventions

A large part of ATREE's activities are organized under three centres that use interdisciplinary approaches to engage in research and action, policy analyses, and outreach. ATREE's Academy for Conservation Science and Sustainability Studies cuts across the three centres to train a new generation of environmental leaders, at all levels and from multiple constituencies, for the further development and practice of sustainability science. The field extensions of the Academy are dynamically linked with the centres. They also serve as Community-based Conservation Centres that foster conservation and sustainability practices at the grass roots level, provide a forum for local discourse and action, engage local schools in environmental education, and provide means for a two-way flow of information and ideas about environmental issues between generators and practitioners of knowledge.





Geographically, our focus remains on the Western Ghats and the Himalayas, the two global hotspots of biodiversity, though increasingly we are drawn to other important regions with significant environmental concerns, and many of our programmes are national and regional in scope.

Our unit in Bangalore, with its 20,000 sq. feet 'green' building serves as the main office and hub for all activities pertaining to the Western Ghats, the Ph D programme, and as anchor for field academies at Biligiri Rangaswamy Temple Wildlife Sanctuary, Male Mahadeshwara Hills and Kanakpura in Karnataka, Agasthyamalai and Natham in Tamil Nadu, and Vembanad in Kerala.

The second unit in Darjeeling addresses pressing conservation issues in the Northeast Himalayan region. The field office in Guwahati coordinates conservation management of the UNESCO Natural World Heritage sites at Kaziranga and Manas National Parks.

ATREE's third unit in Delhi pursues research as well as acts as a liaison policy office due to its proximity to government and bureaucratic circles.

The Kanchenjunga from Sikkim



## highlights

The highlights are a snapshot of work-in-progress of programmes that have long-term objectives. Some of the programmes reported here have reached a stage of denouement; others have only just been initiated. There is active interchange of ideas and inputs between disciplines, as outlined by the centres. Divisions between centres are porous, and the programmes are richer because of the overlap between disciplinary perspectives. This point is illustrated in the detailed stories on the Vembanad and the Conservation and Livelihoods Programme that follow the highlights.

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## centre for conservation governance & policy

The Centre for Conservation Governance and Policy facilitates dialogue between field practitioners, scholars and policy analysts. The objective of this Centre is to apply learning to improve policy frameworks that impact biodiversity conservation and livelihoods. The role of field academies and Community-based Conservation Centres is crucial to framing questions regarding governance and policy in a way that is relevant to community and long-term conservation needs.

### Implications of the Recognition of Forest Rights Act, 2006

ATREE has been facilitating and monitoring the Forest Rights Act in several sites in Karnataka to secure livelihoods, evolve participatory governance of forests and to inform policy.

Our learnings from socio-economic studies on livelihoods and of the impacts of conservation projects on communities dovetail with the objectives of the Forest Rights Act. We believe that a decentralized and rights based approach for natural resource management will enable greater local involvement and sustainable futures. Local communities are more likely to resist macro-economic drivers of change if they perceive long-term, secure, and legal stakes in forests.

The Act identifies Gram Sabhas as being best able to ensure representative and accountable devolution for granting, implementing and monitoring rights. ATREE facilitates relevant information flow to communities through associations with local community groups to assist them in claiming rights and discharging their responsibilities.



Making a statement: RFRA meeting in progress at Gundalpet, near Gundal dam, Kollegal taluka, Chamrajanagara district.

## Wetland Regulatory Framework & the Need for Democratic Participation

When the Ministry of Environment and Forests (MoEF) drafted a first-time regulatory framework for wetland conservation in 2008, ATREE took the opportunity to examine the proposed rules based on the Wetland Conservation team's work with Vembanad fishermen, naturalists, bird-watchers, farmers, students, scientists, and journalists over recent years in Kerala. The Vembanad is India's second largest wetland system and a Ramsar site which has seen much abuse and overuse. ATREE's Wetland Conservation team has played a central role in creating participation from within the stakeholder groups for the management of this resource. That story (*The Vembanad Story: How to Own a Lake*) follows the highlights.

The main point of contention with the central government's draft policy is that it provides a legally enforceable mechanism for wetland use and management, but excludes the stakeholders and the state of Kerala from its management. ATREE has suggested legal rights of participation to those deriving their traditional livelihoods from the wetlands.

ATREE has also questioned the aspect of the current draft that leaves scope for vested interests in wetland use, while ignoring sectoral development plans for poverty alleviation and livelihood improvement. In addition, ATREE has recommended a broad policy on wetland conservation, within which the state could have the legal leeway to control aspects of wetland use and management.




Vembanad Lake: Belongs to everybody and nobody. A wetland ecosystem under stress, with competing resource use such as sand mining, reclamation, fishing, clam collecting, irrigation and tourism activities.

## Rights & Livelihoods

ATREE's work on reconciliation of livelihoods with conservation attempts to influence policy on decentralized and collaborative management of landscapes. Our insights into management practices of local communities living in or near forests have provided evidence of possible linkages between conservation and livelihoods. We believe that ensuring local rights in conservation and livelihoods will, over the long term, enable better governance of forests. This will, however, need more adaptive regulatory mechanisms and monitoring by the state.

The 12-year programme has involved forest-dwelling communities, the Forest Department, Panchayats and community-based institutions in various efforts – spanning enterprises to agriculture to monitoring.



Putting Soligas back on the map at Biligiri Rangaswamy Temple Wildlife Sanctuary. Mapping traditional sacred sites and clan boundaries empowers the community to justify their forest rights.

Probably for the first time in India, traditional sacred sites of the centuries-old Soliga community were mapped, revealing a long association and extensive presence within the forest. Today, Soligas' movement within forests has been restricted, and their local knowledge of forest ecology is eroding. ATREE's work with Soligas has tried to understand how closely their local practices might be harmonized with current conservation objectives. We hope that this localized effort will be an example for other protected areas in the country to similarly evolve inclusive and democratic governance of forests.

## Compensatory Afforestation Fund Bill, 2008 & the Rocky Road Ahead

The Compensatory Afforestation Fund Bill makes it possible for states to divert forestland (including protected areas) for non-forest use in lieu of a certain amount paid towards afforestation. ATREE contends that accumulation of afforestation funds does not guarantee forests. Without parallel, time-bound action in forestation, the result could easily accumulate monetary returns along with accumulating denuded areas. ATREE's Centre for Conservation Governance and Policy presented a memorandum to the Parliamentary Standing Committee on Science, Technology, Environment and Forests, stating its objections to the Bill and its deleterious effects on conservation.

Some of the arguments against the bill are:

1. How do we assess the value of a complex, integrated ecosystem, which has traversed an epic time curve to reach this state? How is the time factor built into the net present value (NPV) assessment of forests?
2. The positive intent to afforest is acknowledged, but how will afforestation replicate or replace the dynamics of the various services derived from an established forest? Such services include water regulation, educational and cultural heritage, carbon sequestration and niche livelihoods.
3. How do the enormous fiscal returns of Compensatory Afforestation Funds – INR 5000 crores in six years, and growing – provide state governments incentive to protect a forest?

## The Role of Fiscal Instruments in Biodiversity Conservation

Non-timber forest products (NTFP) like *amla*, bamboo, soapberries, tubers, fruits etc. are an important source of income and sustenance for communities that stay in forest fringes. However, they are not always ensured equitable returns or benefits from the harvest of such products. ATREE looked at fiscal instruments that could help improve livelihood incomes and encourage sustainable extraction of NTFP, thereby making biodiversity conservation efforts in those parts more effective. The report found that the current state practice has two defects – forest taxes on products are fixed arbitrarily, and the funds that are generated from these are utilized for non-specific, generic purposes. The report has been presented as a template for designing fiscal instruments to generate funds that can be specifically allocated for livelihoods and conservation.

## The 'Life & Leaf' Story



Biodiversity-based livelihoods: Earning more from value-added products could 'sustain' the use of non-timber forest products. Women crafting products from bamboo and malingo.

Local resources. Design. Innovation. Income generation. Responsible use. Livelihood security. Disjointed words, but they form a special story of success. Under ATREE's conservation and livelihoods programme in the northeast, 201 households have been initiated into alternative income generation schemes that allow them to expand their economic and social capacities, without harming the biodiversity-rich areas where they live. The villages are within and on the periphery of the Seneh Wildlife Sanctuary, Kurseong Territorial Forest and in the Darjeeling Reserved Forest.

Green vegetable cultivation, apiary, mushroom, ginger and large cardamom cultivation, bamboo craft, malingo weaving, stitch craft and paper craft, organic tea are new alternative livelihood options. Retail products are marketed to regional visitors through the Life and Leaf store in Darjeeling.

Interventions like this not only raise awareness levels, they also induce practical action among the target communities. Today, conservation stewardship in the form of planting indigenous trees for restoring degraded patches is an annual activity. The increase in cash incomes provides

incentives for local conservation action, and villagers are both better organized and more motivated to initiate activities oriented towards conserving biodiversity.

## suri sehgal centre for conservation science

The Centre focuses on research and action that improves knowledge and appreciation of natural and managed ecosystems and the services they provide:

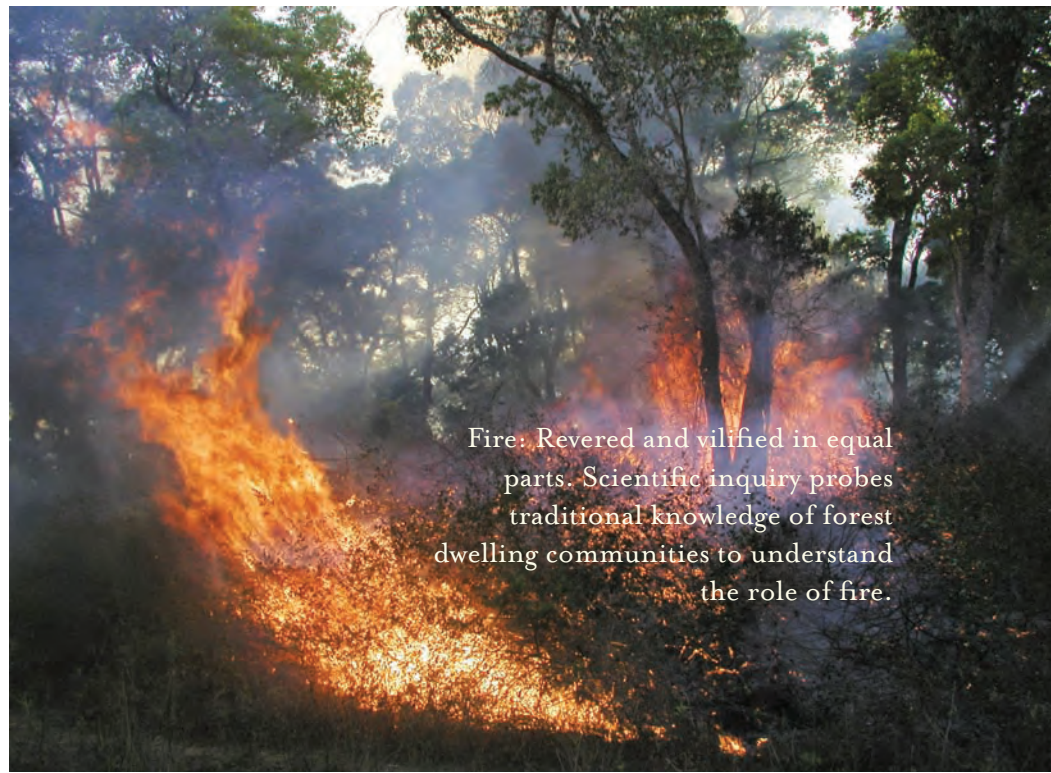
- Structure and function of biodiversity and ecosystem services
- Human impacts on biodiversity and ecosystem services
- Changes in these due to local and global changes

Understanding this helps prioritize outreach activities in conservation awareness and natural resource management, and also in enlisting civil support for conservation action.

### Rethinking the Role of Fire in Ecosystems: A Potential Tool for Management

Is there a beneficial role for fire in the ecosystem? Is the practice of fire management still relevant in today's altered landscape? What proportion of our forests burn every year? What kinds of forests and vegetation types are more prone to fires? Does the use of fires as a land-management tool alter vegetation types dramatically? What are the effects of forest fires on livelihoods, forest produce and on forest weeds like lantana?

ATREE's research on invasive species and fire, the dynamics and linkages between the two in tropical forests, informs theory on how natural fires may occur and the differences between anthropogenic and natural occurrences. Forest-dwelling communities distinguish between litter fires and canopy fires, what times of the year fires are beneficial to sprouting plants and detrimental to parasites and weeds, and litter-burning that adds to land fertility. In contrast, the dominant perspective conventionally held is that all fires are destructive and to be prevented at all costs. Global research on fires and fire management supports ATREE's observations on use of fire. The programme has potential to influence policy on local forest management and legal framework regarding land-use management by fire.




Fire: Revered and vilified in equal parts. Scientific inquiry probes traditional knowledge of forest dwelling communities to understand the role of fire.



## Forest Canopies — An Unexplored Biotic Frontier

Tropical forest canopies are considered to harbour the maximum diversity in a moist forest ecosystem because they provide various structural and functional niches for several organisms to exist. However, they are a challenge because access to canopies is not easy. The Kalakad–Mundanthurai Tiger Reserve (KMTR) team has made progress towards intensifying canopy research by setting up rope access to several canopy platforms in KMTR. This has led to new information on forests and more specifically, on the canopy as a habitat.



Better and safer techniques to access forest canopies opens this complex ecosystem to new discoveries.

ATREE's canopy-centric studies in the Western Ghats established conclusively that the results of a combined ground- and canopy-based sampling are superior to those from traditional ground-based sampling alone. The team discovered that the Malabar spiny dormouse, which is cited in literature as being an elusive species, is certainly rare on the ground, but common in the canopy. When preliminary comparisons were made between canopy and ground, several families of insects were found to be absent in the ground litter, thus making canopy a distinct habitat for insects. There were also spatial variations in occupancy of canopy organisms within the canopy. There were more arboreal epiphytes in the inner canopy than in the outer, whereas for insects, the outer canopy was found to be the most diverse region. The results of these and other canopy studies will provide material for discussion in the 5th International Conference on Canopies (<http://canopy2009.org/>) that ATREE will host in October 2009. The conference will highlight relevance of canopy research with respect to climate change, sustainability and conservation.

## Community-based Vembanad Fish Diversity Survey

One of the most successful instances of community involvement has been the Vembanad fish count. The Wetlands Conservation Team has been making quiet forays into the community surrounding the Vembanad – through education programmes, fisherfolk activities, through local media and influential community groups. These stakeholder groups have touched each other at instances; at others, as in the fish survey, and water pollution survey, they have combined forces to claim the Vembanad as their own. Students, farmers, journalists, community-based groups, fishermen and women, journalists, scientists made the survey numbers meaningful by their joint effort.

## Manas National Park: A Heritage in Danger

A study on landscape level changes and prey–predator populations in Manas Tiger Reserve was carried out in 2008. Tiger populations have been hit directly – through hunting and poaching for international markets, and indirectly – through hunting of prey species and habitat destruction. The study found that total forest cover inside the tiger reserve had decreased by 5.78% between 1990 and 2004, of which, 12.7% was loss of very dense forest. Southern forests had succumbed more to political unrest, encroachments and grazing pressure. There had been substantial increase in non forest areas, and marginal increase in grasslands.



Wild water buffalo and other bovids in the Manas National Park have to compete with domestic livestock for grasslands.

Studies on predator–prey densities revealed a prey density figure lower than that in the Himalayan Terai, and tiger camera-trap capture rates much lower than all other tiger habitats in India. The key to survival of the predator-prey system in Manas will depend on multiple factors – from effective anti-poaching measures to scientific habitat management. ATREE will continue its monitoring study of the Manas National Park under the World Biodiversity Heritage plan.

### Critical Ecosystem Partnership Fund to Promote Strategic Conservation Action

The Critical Ecosystem Partnership Fund is a joint initiative of Conservation International, the Global Environment Facility (GEF), the Government of Japan, the John D. and Catherine T. MacArthur

*Macaca silenus* or the lion-tailed macaque is endemic to the Western Ghats, which means that it is found nowhere else on earth. It is one of the rarest and most endangered primates on the planet.



Foundation and the World Bank. It is a channelizing mechanism to disburse funding and appropriate training to civil society initiatives working towards biodiversity conservation.

In the Eastern Himalayan region, ATREE is coordinating the CEPF (Critical Ecosystem Partnership Fund) initiative with Worldwide Fund for Nature (WWF). In the Western Ghats, ATREE will lead strategy for the investment of USD 4.1 million in conservation activities, within a period of 5 years, by 2013. ATREE's role is to assist in the design, implementation and replication of successful conservation activities, review grant applications, and directly award small grants.

## Coastal & Marine Programme

The Coastal and Marine Programme completed its second phase of the UNDP-initiated post-tsunami analysis of the impacts of the tsunami on coastal populations and ecosystem use. The applied learning from this analysis details the medium and long-term interventions that will ensure sustainability of the tsunami-affected coastal environment.

Components relating to land use and hydrology, socio-ecological studies, policy analysis and pilot restoration analyses were identified. The practical context of rapid coastal development, increasing resource needs and legislative mechanisms were kept within frame so that recommendations could suggest ways of encountering these.

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## centre for eco-informatics

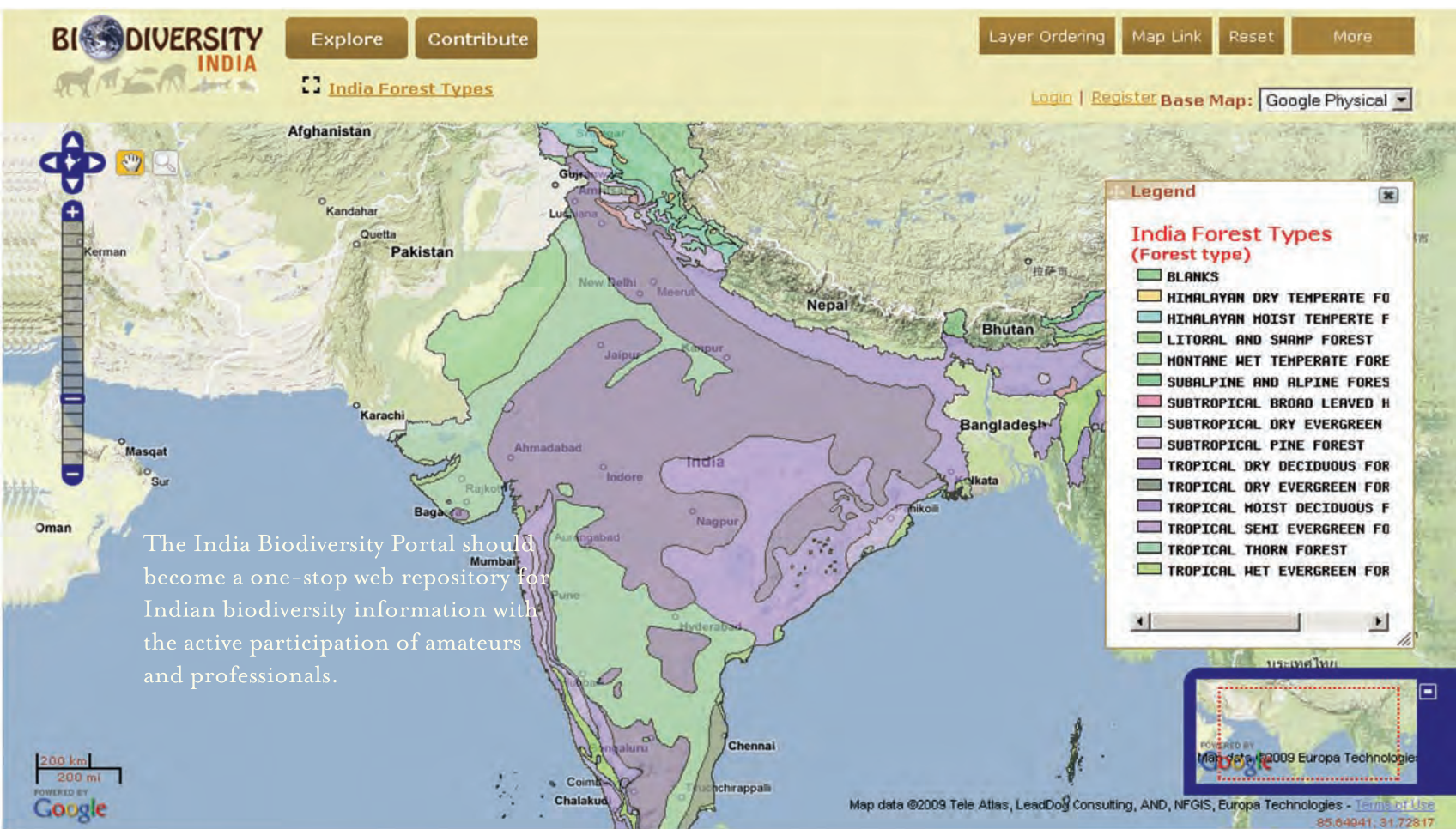
The mandate of the Centre for Eco-informatics is to organize the vast amount of data collected in a way that allows its access and use by researchers, environmentalists, students, teachers, planners, policy-makers and the public. The main objectives are to:

- Assemble, organize and disseminate ecological, geophysical and socio-economic data to enable sharing and participation.
- Build capacity of environmental professionals to handle large databases and add to them through use of geospatial technology and modelling mechanisms.
- Develop new tools using geospatial information technology, for application in conservation planning and natural resource management.

## India Biodiversity Portal

The India Biodiversity Portal (IBP) utilizes the World Wide Web to unite enthusiasts and chroniclers of biodiversity – amateur and professional. IBP promotes citizen science by providing a platform for civil-society members to participate in documenting and sharing of data, and images on biodiversity.

2008 was the year of technology-enabled community engagement for the Centre for Eco-informatics. The National Knowledge Commission appointed ATREE as the lead organization to create and manage a web-enabled portal that mapped India's rich biodiversity. This was the first time in India that such a rich resource was being facilitated for amateurs and professionals.



The India Biodiversity Portal should become a one-stop web repository for Indian biodiversity information with the active participation of amateurs and professionals.

The IBP is a perpetual work-in-progress interactive site, which requires feedback and suggestions from users. It can be accessed at <http://www.indiabiodiversity.org>. It invites participation and contribution from amateurs, scientists, academicians, students, NGOs, researchers to lay out validated, shared information on abiotic, land use, conservation, species sighting and other themes.

IBP is a people-driven initiative, whose success and quality of information will be dependent on the traffic and inputs it receives. The interactive platform is based on a wiki model and the contents governed by the Creative Commons license. It was launched in December 2008 at the Infosys campus with Mr Sam Pitroda, Chairman of the National Knowledge Commission, GOI, as the chief guest.

## Spatial Databases

The lack of a central repository of biodiversity data and tools for eco-spatial analyses prompted ATREE to create an online database of ecological resources. The database was uploaded in 2008, after three years of compilation and validation. This exercise of developing a sharable database has been in keeping with the Centre for Eco-informatics' Open Source, Open Share policy.

The Centre has been engaged in developing several types of databases, which include spatial and non-spatial data. Conservation databases include spatial data about the biophysical parameters of peninsular India in GIS format, as well as about 2000 species locations. These form an archive of ecological, biophysical and socio-economic information about various ecosystems, with a focus on Western Ghats. In addition to these, species databases for plants (17,000 species of flowering plants) and insects of India (butterflies, ants and grasshoppers) have been compiled. These include not only listing and curating, but also repositories of images, identification notes, maps and synonyms, which in turn can be accessed through multiple pathways using identification keys for database query or image query. The database can be accessed at [www.ecoinfoindia.org](http://www.ecoinfoindia.org).

## emerging issues

### Urban Ecology

Are freshwater services available to all in your city? Where are the freshwater services located? What are the carbon sequestration areas – or areas that can trap and process carbon, in an urban space? What services do parks, tanks and other areas open to common use offer urban citizens?

ATREE, in association with the Stockholm Resilience Centre (SRC), is involved in a 12-city, international urban socio-ecological atlas project, which aims to create a map of select ecosystem services in each of these cities across the world. It will map the degree of access that different socio-economic groups have to these services. The atlas will include temporal changes, and provide guidelines for urban spaces where specific management interventions, protection, restoration or creation would be most needed from a public interest point of view. The focus of the atlas project is on freshwater services, carbon sequestration and recreation and cultural services. The project will be initiated in 2009, in Bangalore.

### Assam: Building Partnerships to Support World Biodiversity Heritage Sites

ATREE is coordinating the implementation of a four-year project for the promotion of long-term management and conservation of UNESCO's Natural World Heritage sites in Manas National Park and Kaziranga National Park of Assam.

The project, which started in 2008, works with forest staff, local communities and civil society to create a consolidated and participative programme for site ownership and management. Practical activities revolve around building capacity of forest personnel for better management and governance, upgrading equipment, enhancing habitat connectivity, involving local communities and raising the profile of these sites in civil society. Park infrastructure has been strengthened to combat poaching activities.

At both sites, networks with relevant stakeholders have been established. Research problems have been identified and prioritized with inputs from the Forest Department. As part of raising awareness and local involvement, a unique scholarship scheme has been initiated for students and young scholars from the fringe villages.





## the vembanad story

### how to own a lake

The Vembanad is a lake that serves many stakeholders in Kerala. It is a source of employment, water, navigable interconnecting channels, entertainment and food. It supports a unique ecosystem, whose health is maintained by the natural flow of sea water into this freshwater body. Like many other natural resources, the Vembanad has seen much abuse. However, as ATREE found out, the people who live on the periphery of the lake also have immeasurable affection for the Vembanad. The pictures below chronicle some of the travails of the last five decades, and then some instances of a little bit done to save the Vembanad, in small measures, by small community groups. The story and the lake belong to these groups of people.



A picture of sublime beauty and one of the important wetland sites of the world. Backwaters, marshlands and man-made canals connect to support a unique way of life.



Discontent and resource conflicts exist beneath the calm surface. Reclamation has meant that the Vembanad is one-third the size it used to be 50 years ago. Fishermen have watched as paddy replaced water and fish populations declined.



Picture-perfect paddy fields hide a story of inorganic pollution and land quality decline. The mix of factors that has resulted in the former 'rice bowl' of Kerala importing rice from its neighbours is causing concern at various stakeholder levels.



The unorganized spate of tourist traffic cannot be termed 'ecotourism' as it is neither good for ecology nor for tourism, in the long-term. The strain that this kind of 'ecotourism' places on traditional livelihoods and the ecosystem is immense.



The Thanneermukkam barrage controls flooding and salinity to enable farming in the wet season. It also manipulates the natural process of seawater flushing that formerly made this lake unique. So hyacinths, ordinarily not found in brackish waters, flourish. And fish and shellfish populations suffer.



For two days, fishermen and women offer prayers for fish and shellfish, with the faith that they will thrive and continue to sustain fisherfolk livelihoods. The ecological significance is that this ritual is observed on the two days most propitious for fish spawning. The ceremony highlights the fact that traditional wisdom also seeks restraint and conservation.



School children devise a story that links the lake to their lives, their food, their traditions and environment. The *Jalapaadom* story of conservation education is probably the most strongly-rooted and developed story of intervention. It has grown outside schools and colleges to include pollution studies, fish count surveys, newsletters and general awareness programmes.

Students liked the idea of collecting data by close observation of their surroundings as a research methodology. Learning data collection methods feeds directly into *Jaladarpanam* – a participatory programme for water quality monitoring. Information on quality deterioration helps policy makers improve current management practices.



From 150 fish species down to just 50, over the last 50 years. Fisherfolk, community organizations, journalists, farmers, college students, school children, village elders, politicians and scientists take up the sobering task of counting the remaining species, to monitor progress.



Under a newly formed draft regulatory framework for wetlands conservation, all legal powers for conservation and regulation are vested with the central government. But then how does the state and community take conservation action when it has no legally allowed participatory rights? How does it show its affection and revere the Vembanad?

## forest-dwelling communities & conservation

a brief view of ATREE's interdisciplinary approach

For many years, the conventional conservation approach has been to demarcate areas of high biodiversity and 'protect' these from all human interaction. This approach has often meant physically removing tribal and forest-dwelling communities from areas that they have inhabited for centuries. The displacement and denial of access generate conflicts and resentment in communities that have lived in and around forests for generations, who now perceive wild flora and fauna to be more privileged than themselves.

To these communities, the forest is home. Their inheritance of natural forests, not captured in any legal document, translates over the years into an informal, inherited custodianship of the forest. These communities derive their emotional, cultural and material sustenance from forests, and the impact of forest loss and degradation on the livelihoods and social health of these communities is very high.

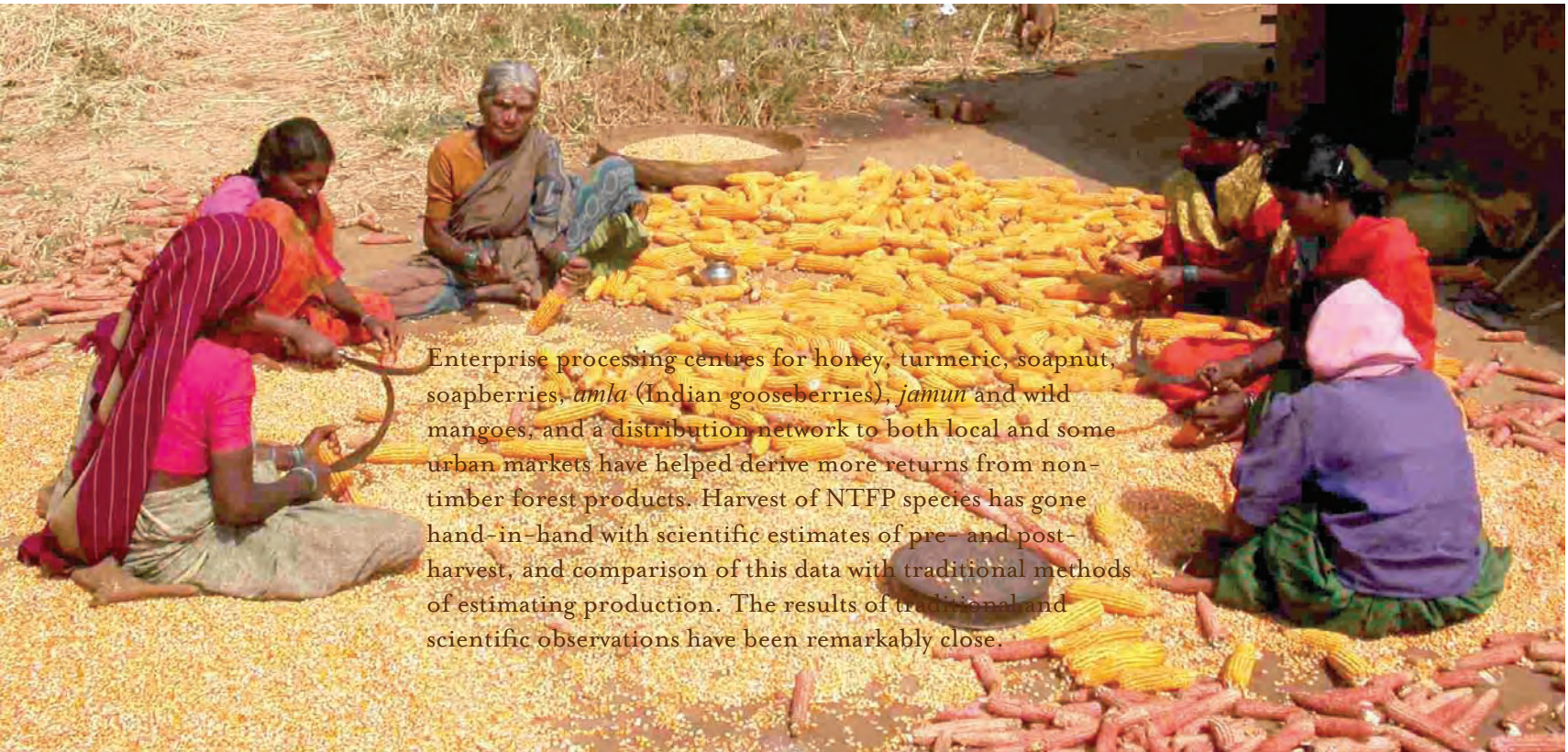
ATREE's Biligiri Rangaswamy Temple (BRT) team has closely worked with Soliga *adivasis* of the BRT Wildlife Sanctuary and Male Mahadeshwara Hills, mapping sacred sites, recording stories of village elders, studying local forest and agriculture practices, and knowledge of forest dynamics and change. By marginalizing communities and livelihoods, we are missing a crucial opportunity to incorporate human-forest interactions into current conservation approaches.

The integrated approach that ATREE developed to understand these interactions has involved understanding local ecological knowledge that guides and informs activities of communities, while assessing effects of non-timber forest produce harvest by communities. Our learnings evolve from an analysis of socio-economic data and the current and historical policies that have a bearing on access, or denial of access, to forests.



Lantana Craft Centres are specialized units that have received training on converting the invasive weed, *Lantana camara* to marketable furniture. 150 Soliga artisans have undergone training in these centres, with 75 no longer supplementing their incomes with migrant labour.





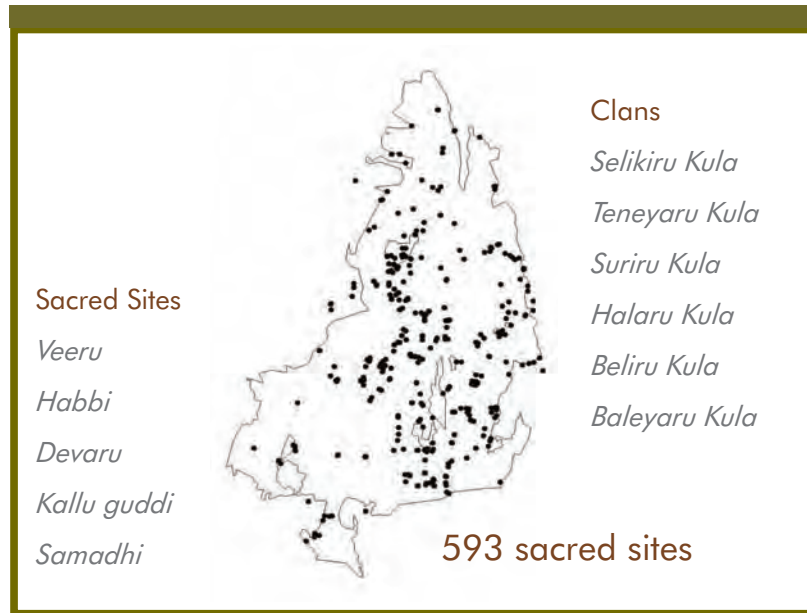
Enterprise processing centres for honey, turmeric, soapnut, soapberries, *amla* (Indian gooseberries), *jamun* and wild mangoes, and a distribution network to both local and some urban markets have helped derive more returns from non-timber forest products. Harvest of NTFP species has gone hand-in-hand with scientific estimates of pre- and post-harvest, and comparison of this data with traditional methods of estimating production. The results of traditional and scientific observations have been remarkably close.



Monitoring activities consist of participatory mapping and assessments of fruit production, fruit harvest and regeneration. Participants share methods for best harvest techniques, parasite removal, and how much fruit to leave for regeneration. Local communities in BRT are monitoring biodiversity and developing alternative livelihoods that will supplement their dependence on non-timber forest products.



The mapping of sacred sites was perceived by the Soligas as an important activity that could serve as a political tool for claiming rights on the basis of their historical presence in the landscape from which they are presently denied access.



The Scheduled Tribes and Other Traditional Dwellers (Recognition of Forest Rights) Act, 2006 provides the Soligas a first-time opportunity to investigate state legalized rights-based approaches to community inclusion in resource management. It also creates grounds for legal access to common forest resources for livelihoods.

## enterprise-based approach to conservation in the northeast himalayas

There were two questions that guided ATREE's work:

1. If incomes from sustainable non-timber forest produce harvesting can be enhanced, will this provide economic incentive to conserve biodiversity while also helping maintain local livelihoods?
2. What are the institutional arrangements needed to foster sustainable practices among traditional forest-based communities?

ATREE's work in the Northeast, with villagers in the periphery of the Senchel Wildlife Sanctuary, Kurseong Territorial Forest and in the Darjeeling Reserved Forest, has shown the value of building livelihood projects on innovation and adaptation. One profound change villagers have articulated is the dramatic decrease in their social and ecological vulnerability as a result of alternative livelihood enterprise. On the social side, they now possess new and broader knowledge and skill sets, a diverse array of livelihood options, and a stronger sense of their ability to promote their own sustainability.

Forest-dwelling communities now engage in negotiations with the Forest Department over joint management of forest lands, where previously they had to accept whatever decisions were handed to them, without providing input. Ecologically, they are no longer dependent on a dwindling supply of non-timber forest products – fuelwood in particular – and now have diverse income-producing options. The change in livelihood choices has strikingly altered how these agriculturalists relate to and understand their ecosystems.



Through persistent efforts by ATREE, and alternative livelihoods opportunities sustained by new market linkages, villagers have completely stopped making wood charcoal, relieving stress on forests in the area.

## academy & outreach

The ATREE Academy for Conservation Science and Sustainability Studies incorporates our innovative interdisciplinary doctoral programme and capacity building of a range of stakeholders. The Academy is not bound by notions of conventional classroom teaching. Its purpose is to inform and to educate, and it accomplishes this through field programmes with its students; outreach activities with the communities it touches; skill building programmes with staff and faculty of government and non-government institutions; and through situation-tailored programmes for community leaders, in addition to classroom settings. The course for capacity building, outreach, field and networking programmes is set through a consultative process, which makes it a responsive, constantly evolving programme.

The Academy brings together ATREE faculty and scholars from other national and international centres to offer the best possible courses and workshops. ATREE has a formal collaboration with Stockholm Resilience Centre and Norwegian University of Life Sciences. Last year, visiting faculty from the Department of International Environment and Development Studies, NORAGRIC, Norwegian University of Life Sciences – Professors Arild Vatn and Paul Vedeld completed their teaching at ATREE, as did Dr Sharad Lele from CISED.

### Interdisciplinary Doctoral Programme



ATREE offers an interdisciplinary doctoral research programme in conservation science, which requires rigorous course work. The degree is awarded by Manipal University, Manipal, Karnataka, with ATREE faculty in charge of the academic programme. The 2008 batch had seven students. Topics for research covered the patterns and processes of the spread of *Lantana camara*, primate conservation in Protected Areas, insect community responses to habitat restoration in tropical forests, restoration of abandoned tea estates, among others.

The Department of International Environment and Development Studies (NORAGRIC), Norwegian University of Life Sciences has had visiting faculty cover subjects in political ecology and the socio-economic, institutional and ecological aspects of global change.

## Conservation Education at Schools

Conservation education is part of the Community-based Conservation Centre activities at ATREE field sites in Karnataka, Kerala and Tamil Nadu. The programme includes children as well as teachers. Activities are diverse, ranging from creating nurseries, documenting floral and faunal biodiversity, understanding water-efficient ways of cultivation, anti-plastic campaigns, sanitation awareness and other topics that are generated by the group, or through the needs of the community. Several times, through sharing of space and tapping self-help groups as a ready-made assembly, the conservation education outreach has spilled into community networks.



The *Jalapaadom* programme has been instrumental in creating a foundation for some very sound community outreach activities. It is a school conservation education programme that has grown organically to absorb communities around the Vembanad wetlands. *Jalapaadom* has initiated a succession of increasingly participative activities like workshops on butterflies of Vembanad, fishes of Vembanad, student-produced newsletters, plays and puppet shows, water quality tests, data collection and biodiversity logs of Vembanad avifauna. Conservation education around Vembanad has seeded participatory and inclusive activities with students, media and other community groups.

## Engaging Civil Society

The Sorimuthaian Iyanar temple on the banks of the Tamiraparani in Kalakad–Mundanthurai Tiger Reserve attracts a large number of pilgrims during the *adi-amavasai* (new moon) day in August. They cook, wash, and defecate in the 3–5 days that they camp here, placing enormous strain on the ecosystem. Wildlife gets run over, forest fires are started and garbage mounts up.



ATREE carried out an intensive no-plastic campaign for 3 years, starting 2006, that resulted in a ban on the use of plastics inside the reserve. The anti-plastic campaign involved the Forest Department, and various other segments of society: schools, colleges, Panchayats, the Raja of Singampatt and the Lions and Rotary Clubs. The ban was effective because of the widespread support by village communities who were sensitized to the ill effects of solid wastes in forests through plays, skits, processions and interactive sessions. These, combined with fines instituted by the Forest Department on the use of plastics, created awareness and checked the inflow of non-degradable plastic inside the tiger reserve.

## Community Outreach



RFRA meeting with community-based organizations

The Recognition of Forest Rights Act has given impetus to rights-based claims of communities in forest fringes. There is a role for Panchayats, for forest user groups, for traditional institutions and for local community-based organizations and NGOs. However, the step from Act to implementation requires a basic understanding of the process of claiming rights. This is where workshops have guided forest communities into claiming collective rights for themselves.



Soliga artisans have been trained in the techniques of converting a prominently invasive weed, lantana, into marketable furniture. This has been perceived as a viable livelihood alternative, especially for women whose men folk have migrated in search of labour. It has also helped counter the ban on bamboo harvest that had decimated traditional livelihoods in bamboo basket weaving.

## Workshops

‘Learning for Life – Conservation Education in our Work and World’ at Navadarshanam, Gumalapuram, Tamil Nadu, was a skill share workshop for practising environmental educators, programme coordinators, and applied researchers.

‘Forest Fire Management in India: Integrating Ecological and Cultural Contexts and Consequences’, organized jointly with the University of Freiburg, Germany, and the Centre for International Forestry Research, Indonesia was a brainstorming workshop, attended by project partners from the Foundation for Ecological Security, the French Institute, CHIRAG and the Global Fire Monitoring Centre.

The Eastern Himalayas office of ATREE organized a two-day interactive workshop, which brought together researchers and professionals from ATREE Bangalore, the Northeast and the Darjeeling Himalayas to share regional experiences on conservation and livelihood action.

## khoshoo memorial award & khoshoo memorial lecture

The Khoshoo Memorial Endowment Fund was set up by the Khoshoo family and ATREE to honour the memory of the great scientist and visionary Dr. T.N. Khoshoo, former Secretary, MoEF. The fund provides support for the Khoshoo Memorial Lecture and a Khoshoo Memorial Award in Conservation every year. The award ceremonies and lecture are held in Delhi.

The award for 2008 was given to noted naturalist, Rebecca Pradhan, for her contribution towards conservation of flora and fauna in the Himalayas, at a function organized at the India International Centre, New Delhi on 25th March 2008. The Khoshoo Memorial Lecture was delivered by Dr. Ramachandra Guha, author and historian. The ceremony was presided over by Shri Digvijay Singh, General Secretary of the Congress Party.

## faculty interests

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### Gladwin Joseph, Senior Fellow and Director

I am interested in a systems approach to natural resource management, which integrates both social and natural sciences, with a focus on restoring landscapes and strengthening pertinent institutions at various scales. I am specifically interested in studying traditional systems of agriculture and land-based livelihood strategies. I believe that strengthening and diversifying farming systems using agro-ecological principles will increase the resilience to vagaries of climate, markets, and wildlife damage. For small and marginal farmers, linking such diverse farms to value-addition technology and markets may improve livelihoods more than other top-down models of farming. I am interested in the interdisciplinary science and practice of biodiversity-rich farming that is socially and ecologically relevant to the farmer.

### Jagdish Krishnaswamy, Fellow and Convenor, Suri Sehgal Centre for Conservation Science

My research seeks answers to questions in forest hydrology, ecosystem services, landscape ecology, protected area management, conservation planning and monitoring. The questions centre around impacts of forest degradation and climate change on hydrology of forests in the Western Ghats, mapping of biodiversity in tropical forests, synergies between biodiversity conservation and maintenance of hydrologic and other ecosystem services, biodiversity values of human managed ecosystems, potential of generating ecosystem services in urban landscapes and ecosystem service values of canopies in the Western Ghats.

### Seema P, Fellow and Convenor, Centre for Conservation Governance and Policy

I have been working in areas where economic policies or regulations could make a favourable dent in natural resource management, and hence poverty. My focus has been on interactions between natural resources on the one hand and ecosystem people, the state and/or profit seekers, on the other. Research foci include economic instruments for conservation, agricultural policies and sustainability, and ecosystem services – trade-offs, management and incentives.

### Ankila Hiremath, Fellow and Regional Director, Delhi

In the last few years, invasive species and fire – both very noticeable influences on our forested landscapes – have been the focus of my work within a larger interest in ecological restoration. Our invasive species work is closely related to restoration from a conservation perspective: Can we restore ecosystems to some semblance of their original structure and composition? Our work on fire is related to restoration from a sustainable-use perspective: Can people's use of fire be transformed from an uncontrolled and often destructive practice into a sustainable management tool to achieve the landscape management objectives of various stakeholders?



## Suman Rai, Fellow and Regional Director, Eastern Himalayas Programme

As the Regional Director, my primary role in the Eastern Himalayas Office is to lead the team. In executing this role I intend to achieve three basic outcomes, viz.: (1) facilitation of an enabling environment for our operation through building networks; (2) exploration of strategic issues for conservation action; and (3) realization of resources required for executing our long-term plan. Besides these fundamental functions, I will be promoting awareness on the urgency of conservation in the Singalila National Park. I intend to use an alternative medium comprising imageries of key bird species from this area, which will be exhibited at the end of this annual year. The exhibition will also help raise resources for creating a trust fund for conservation of this unique landscape. Along with this, I will be looking into the widely acclaimed theory of ‘participation’ in the wake of the Forest Rights Act 2006, in order to create an understanding of control and ownership *vis-a-vis* prospects for conservation.

## Priyadarsanan Dharma Rajan, Fellow

Aiming at providing a more human face to conservation, I stand for applying deliberative democratic methods in conservation of natural resources. In the process of deliberative democratic conservation, policies and prioritization are by consensus, evolved through discussions among various stakeholders. I am trying to address some of the conservation issues faced by Vembanad Lake (Kerala) – the largest tropical wetland ecosystem on the southwest coast of India, through such a process ([www.vembanad.org](http://www.vembanad.org)). Being a trained entomologist, my research focus is insect taxonomy and ecology, and my interest is to make taxonomy more user friendly, and information more easily available. My ecology studies focus on understanding the impact of various ecosystem processes on insect diversity, in order to redefine conservation plans. Another area of research interest is ‘Conservation bio-control’, which is an ecological and practical approach to the management of crop arthropod pests that helps reduce the use of pesticides.

## Nitin Rai, Fellow

I am interested in using interdisciplinary approaches to enable decentralized conservation. My research incorporates ecological science, history of landscape transformation, cultural ecology and local knowledge. How is knowledge produced and why are certain forms of knowledge privileged over others? How might history of forest transformation and cultural ecology of local communities be included in forest governance? How do issues of power get implicated in conservation efforts? How might the study of scale help us in identifying macro-economic and policy drivers of local and regional change? Such integrated studies might challenge current narratives that view nature as static and human presence in forests as being inimical to biodiversity.

### R Ganesan, Fellow

I am involved in work on monitoring forest tree recruitment dynamics at BRT forests, and in generating more information on factors that shape vegetation structure in a dry forest. The results of monitoring recruitment dynamics of *amla* trees, and my collaborative work with others on regeneration dynamics are interesting, and can be applied by harvesting communities and Forest Managers to sort out issues related to harvesting practices of *amla* fruits in BRT. I am also contributing as a team member to a project on building a biomass buffer around the Protected Area of Kalakad–Mundanthurai Tiger Reserve to save it from further degradation due to over-exploitation.

### T Ganesh, Fellow

My research interests are about the consequences of faunal loss on forest dynamics, long-term changes in tree phenology and its relation to climate variability, anthropogenic effects on species interactions, long-term changes in population dynamics of migrant raptors and resident owls in relation to land-use changes, and community involvement in conserving them. Though my research work has largely been in the Kalakad–Mundanthurai Tiger Reserve, my larger interest is to understand issues related to protected area conservation. Currently, I am involved in understanding restoration of biodiversity in abandoned plantations in protected areas, from both an ecological and social angle; to develop protocols that would facilitate cost effective restoration and better management of the area by reserve managers. In addition to estimating fuelwood demand on KMTR forests by the fringe village community, my colleagues and I are looking at the various ecosystem services that forests offer to the large human population beyond the reserve.

### Soubadra Devy, Fellow

My broad interest has been in plant–animal interactions. During the course of my work, I realized that the forest canopy has several interesting aspects that remain to be unravelled. In this context, my colleagues at ATREE and I are developing a canopy programme for India. I believe in two paradigms of conservation which are complementary to each other; one is through protected areas network and the other is through extending the biodiversity frontier to production landscape, through participatory approach involving community. Apart from this, I am in the process of putting together my earlier work on various ecological aspects that were carried out over the last several years in Kalakad–Mundanthurai Tiger Reserve. Also, with a .eld academy coming up in Kalakad–Mundanthurai Tiger Reserve, I plan to develop rigorous .eld courses, which cater to various target.

### Robert J Chandran, Fellow

My research interests are related to applied issues on forest management, forest recovery and restoration. In particular, I am interested in developing a framework that will permit the evaluation of management

options for landscapes with substantial forest cover. Forest restoration, fire management, natural resource use, agricultural needs and livelihoods of forest-dependent communities need to be addressed at the landscape scale. This is because development planning is typically done at the landscape scale and changes in one component of the landscape typically influence the others. Ideally, we will need to determine land-use and land-cover change over time (decadal scales) and also identify the factors that drive these changes to understand the future evolution of these systems to formulate development and management plans. Another study that I am developing is a meta-analysis/documentation and review of reforestation efforts in the Western Ghats. The need for such a study arises mainly because the numerous reforestation efforts have not been documented in ways that make information easily accessible to other practitioners of reforestation. These efforts at reforestation constitute ‘experiments’ that would yield valuable data and experience to inform similar efforts elsewhere in the country. Potentially, this approach to studying the process of recovery can be extended to other communities such as insects, birds and other vertebrates. Testing the co-variation of the recovery process is important to assess the rate of recovery of the ecosystem.

### Siddhartha Krishnan, Fellow

My research interests have been focused on policy analysis for wetland conservation in the Vembanad coastal estuary. Other interests include understanding cultural, politico-legal and ecological contexts and consequences of Toda conflicts with tigers and leopards on the Nilgiri pastures in South India, and understanding and mitigating human–wildlife conflict in the Biligiri Rangaswamy Temple Wildlife Sanctuary in the context of the Recognition of Forest Rights Act, 2006.

### Bejoy Thomas, Fellow

I bring in a research orientation to a largely action project in the backwaters of Vembanad, with the aim of creating stronger policy impacts, as well as building practice-based science. I am also working with Dr. Seema Purushothaman in developing the economics teaching component of the doctoral programme in Conservation Science at ATREE.

### Ravikanth G, Fellow

I am involved in the programme on recovery of some of the critically endangered species of the Western Ghats. In this, a major emphasis has been to develop micro-satellite markers and to estimate the levels of genetic variability for some of the critically endangered species. I am also working on DNA bar-coding of some of the economically important groups of plants. I will continue to work on species recovery and monitoring of endangered species in the Western Ghats. I also plan to study the population genetics of some of the tropical tree species in the Western Ghats and estimate the levels of gene flow.

### Siddappa Setty, Post-Doctoral Fellow and Outreach Coordinator

My interests are in poverty alleviation in biodiversity-rich areas through sustainable use of forest resources. I believe this can be achieved by integrating scientific knowledge and approaches with traditional knowledge. I have been working on this from 1994 and have explored possibilities of how the Fellows' research in ATREE can be taken to local communities. I am exploring use of local alternatives for temple offerings in South India, to create awareness on utilizing local/traditional crops for food and temple *prasad* items. I am working with Community-based Conservation Centres to empower communities to actively engage in creating and sharing knowledge and taking action. The aim is to find high quality information to answer specific questions on forest conservation and livelihood-related issues.

### Aravind N A, Post-Doctoral Fellow

I have been involved in studying taxonomy, diversity, distribution and endemism patterns in terrestrial and freshwater molluscs of the Western Ghats. I have collected a large number of land and freshwater snails for the 'Frozen Arc' project, an international initiative to collect, preserve and store DNA and viable cells from animals in danger of extinction. 'Achatina Watch', a web-based people's initiative for mapping the distribution of African Giant Snail, is a programme I run. My proposed work includes molecular phylogenetic analysis to assess evolutionary relation and faunal origin of Western Ghats' land and freshwater snails. I am also assessing the conservation value of freshwater molluscs of the Western Ghats and socio-economic consequences of biodiversity loss in urban areas.

### Sinu P A, Post-Doctoral Fellow

Human-influenced habitats are the focal point of my studies. I have initiated a study to assess how periodical leaf-litter harvesting will affect the regeneration dynamics of tree community of Soppinabetta forests of Sringeri in the Western Ghats. I am also carrying out collaborative research on the community ecology of epiphytic and ground orchids. Reproductive biology and pollination ecology are the other research topics of my interest. I am studying the pollination and breeding system of cardamom in the Western Ghats and Amomum in Sikkim Himalayas. I am also studying the reproductive ecology of some of the emergent tree species of Western Ghats. Besides this, I work on bee ecology, and systematics of *Chlaenius* (commonly called bombardier beetles).

### Naveen Namboothri, Post-Doctoral Fellow

My interest is in marine ecosystems from a species to ecosystem level, which could be useful in conservation and better resource management. On an ecosystem/habitat level, I aim to understand vital processes and functions of ecosystems that are essential in maintaining ecosystem health, and how these processes and functions interrelate with species diversity, distribution and abundance. Based on these studies, I want to

develop an indicator-based approach to monitoring key ecosystems/processes on a spatio-temporal scale. The inherent resilience of ecosystems, how and at what scales ecosystems/species react to human and natural disturbances, and where the thresholds of tolerances lie are also subjects of interest.

### K R Shivanna, Honorary Senior Fellow

Our research activity during 2008 was largely confined to studies on identifying domestication syndromes in cardamom. Domestication of crops in general brings about changes in a wide range of traits when compared to their wild ancestors. Domestication of cardamom (*Elettaria cardamomum*) is comparatively recent. Our studies on two wild and five cultivated populations have shown that in spite of recent domestication, several productive traits such as the number of branches, number of inflorescences and total number of flowers per clump are significantly greater in cultivated cardamom. The principal pollinators in wild cardamom are solitary bees, *Megachile* sp. and two species of *Amegilla*, whereas those in cultivated cardamom are the social bees, *Apis dorsata*, *A. cerana* and *Trigona iridipennis*. The shift in pollinators following domestication is unusual, and in cardamom this seems to be due to the availability of a large number of flowers for prolonged periods in cultivated cardamom, that can attract and sustain social bees, rather than due to co-evolution of the flower and the pollinator.

### Prabhakar, Adjunct Senior Fellow

My interests are in eco-informatics, geographical information systems for conservation, spatial technology and human interactions with ecosystems.

Last year, I led an ATREE team that built the India Biodiversity Portal (<http://www.indiabiodiversity.org>). This is a map-based portal, which is meant to aggregate biodiversity information from scientists, researchers and citizens. The portal is functional, but needs to be enhanced with better participation and some analysis functionality to encourage citizen science.

We are working on a project to provide a framework and a platform for creating social-ecological maps of urban areas. Urban ecology is an area where there are large information gaps, and is gaining importance as more than half the human population will live in urban areas over the next decade.

During the last year, along with my collaborator and colleague, Dr. Somanathan, Indian Statistical Institute, Delhi, I worked on a paper on decentralization and cost-effective conservation. Essentially, this paper compares the cost of community-managed forests and state-managed forests. The analysis is based on detailed field surveys conducted by us in the Central Himalayas during the period 1998 to 2001. The paper has been published in *Proceedings of the National Academy of Sciences*.

I also have interests in bioinformatics and work in a company (<http://www.strandls.com>) that develops tools for gene expression analysis and pathways analysis. We are currently working on a project to support analysis of large scale gene sequencing data.

### T O Sasidharan, Adjunct Fellow

The past century has witnessed an increasing trend of pesticide resistance in insects and a growing concern on environmental toxicity of insecticidal chemicals. Improved modelling, genuine and expert forecasting systems, genetically engineered crop plants and efficient natural enemies are expected to be the conspicuous features of pest management. In this backdrop, along with co-researchers from ATREE and IWST (Institute of Wood Science and Technology) Bangalore, I have carried out detailed investigations on native isolates of the entomopathogenic fungus, *Metarhizium* sp. for control of certain potentially dangerous insect pests of forest plantations and nurseries. In another study, the possibility of using Microsporidia for insect pest control is being investigated. These studies are expected to add new dimensions to our efforts in developing eco-friendly technologies for insect pest management, while preserving the environment.

### Harini Nagendra, Adjunct Fellow

My research has three distinct foci. One research theme combines satellite remote sensing, biodiversity studies and social interviews to study the impact of a range of institutional approaches, including community forestry, joint forest management and national parks on forest conservation in South Asia. A second interest is the study of how processes of human land use interact with biophysical factors to impact patterns of landscape change and forest recovery in Nepal and India. A third area of interest is urban ecology and environmental change, with a focus on Bengaluru.

### Kartik Shanker, Adjunct Fellow

I am interested in the distribution of diversity at various levels of organization, from genes to ecosystems, and at various scales from local communities to macro-ecological regional scales. I study diversification in hotspots by combining molecular genetics, field ecology and monitoring. I have also recently initiated work on coastal and marine ecology, addressing the question of how species diversity is distributed along the coasts.

I have been conducting research on sea turtles for the last decade, on population biology, genetics and evolution, and migration. Five of the seven species of marine turtles are found in Indian coastal waters and at least four have significant nesting beaches and/or feeding areas. My collaborators and I have been studying the population genetics and phylogeography of sea turtles on the mainland coast and islands. Currently, I am involved in projects on Olive Ridley turtles in Orissa, leatherbacks in the Andaman and Nicobar Islands and the impact of climate change on sea turtles.

I have recently initiated research on social aspects of resource use and human–wildlife conflict. In the terrestrial realm, we are developing a synthetic framework to examine conflict in different ecological, sociological and economic contexts, in order to identify the drivers of conflict and to develop solutions. We are also beginning work on the political ecology of natural resource management in coastal and marine systems, and its implication for the conservation of these resources. A project in Orissa looks at various ecological, historical and sociological aspects of the conflict over space between fishers and sea turtles.

### Mohan Seetharam, Visiting Fellow

I have been associated with the Vembanad Wetland Conservation Programme and the several complex, interlinked human–environmental issues within that unique coastal estuary. There are questions of multiple and overlapping land uses, multiple livelihood concerns, and centrally, the question of the ecological health and sustainability of the lake.

As a geographer, my professional interests can be grouped into the following areas:

1. The development and use of geospatial tools for a wide range of activities under land cover mapping, land use planning, and risk and vulnerability analysis
2. Understanding the human dimensions of global environmental change
3. Understanding and working towards sustainable and equitable forms of social and economic development

### Ramanatha Rao, Adjunct Senior Fellow

My major contribution will be research on plant genetic resources and agro-biodiversity at ATREE. My involvement in tropical fruit genetic resource will increase from May 2009 through participation in the UNEP/GEF/Bioversity International project ‘Conservation and Sustainable Use of Cultivated and Wild Tropical Fruit Diversity: Promoting Sustainable Livelihoods, Food Security, and Ecosystem Services’.

Tropical fruit tree species are food crops and perennial species and are good for marginal lands. Thus, any improvement in increased use of the diversity available in fruit species not only contributes to increased food nutrition security and income generation, but also to environmental health. With my vast experience on issues in agro-biodiversity conservation and utilization (genetic diversity status) and trends (including genetic erosion, rationalization of collections, utilization of conserved genetic resources including wild crop relatives, access, intellectual property rights, seed supply systems and bio-safety), I will continue to assist FAO, Bioversity International, National Bureau of Plant Genetic Resources and other such agencies.

## K D Singh, Honorary Senior Fellow

My research aims to establish a scientific basis for non-timber forest product (NTFP) production and consumption, in order to make forest planning holistic and sound. The project involves technical and institutional aspects of NTFP planning, including silviculture research, growth and yield studies, forest inventory and mapping investigations; estimation of potential harvest under alternative management regimes; NTFP collection practices consistent with forest health and biological diversity; and mobilization of traditional knowledge, information and financial support to local communities to prepare and implement the plan. The present research will include policy, legal and institutional issues essential for ensuring sustainable management of NTFP. The long-term objective of this is to update the National Working Plan Code 2004, to give adequate importance to sustainable management of NTFP. The project is funded by DST and the study site is located in the Daspalla block of Orissa.

I am also conducting a study in the Kolasib District of Mizoram, to explore people participation in forest management planning and creating alternatives to slash and burn practices (shifting agriculture), which results in burning of huge quantities of wood: almost the same as the country is importing annually (4 to 5 million cum) for industrial purposes. The second project is funded by the MoEF and implemented jointly with the Forest Department, Mizoram and Forest Survey of India.



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## recognitions

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Ravi Chellam, Senior Fellow, was appointed to a committee for looking into the management and funding of Community Conserved Areas, set up by the Wildlife Division of the Ministry of Environment and Forests.

Jagdish Krishnaswamy, Fellow, was invited as a visiting scientist to the Department of Systems Ecology and the Stockholm Resilience Centre (SRC), University of Stockholm, in March–May, 2008.

Ramanatha Rao, Adjunct Fellow, was selected as a Member of the 2010 BIP Scientific Advisory Body (SAB) of the 2010 Biodiversity Indicator Partnership of the UNEP and World Conservation Monitoring Centre.

Madegowda C. has been appointed as member, District Level Committee chaired by the District Collector, Chamrajanagara district for the implementation of the Recognition of Forests Rights Act 2006.

Seema Purushothaman has been invited to be a member of the Science Committee of Bio-sustainability, a committee within Diversitas, an international programme of biodiversity science.

Sunita Rao received the Essel Award on behalf of Vanastree, for Social Service on 19th April, 2008. The award was given for setting up Vanastree, Malnad Forest Garden and Seed Keepers' Collective and for working on forest home gardens and local seed conservation work in the Malnad region of the Western Ghats.

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Ford Foundation, New Delhi, India  
Foundation for Ecological Security, Anand, Gujarat, India  
Forest Resources Management Project, Govt of Sri Lanka, Sri Lanka  
Gulf of Mannar Biosphere Reserve Trust, Ramanathapuram, Tamil Nadu, India  
Indian National Science Academy, New Delhi, India  
Indo-US Science and Technology Forum, New Delhi, India  
Institute of International Education, New York, USA  
International Foundation for Science, Stockholm, Sweden  
International Union for Conservation of Nature, The Netherlands  
International Sea Turtle Society, California, USA  
JRS Foundation, Philadelphia, USA  
Jamsetji Tata Trust, Mumbai, India  
Mr. Joachim Schmerbeck, Institute of Silviculture, Freiburg, Germany  
Mrs. Kumari Shibulal, Bangalore, India  
Ministry of Environment and Forests, Government of India, New Delhi, India  
Ministry of Tribal Affairs, Government of India, New Delhi, India  
National Geographic Society, Washington DC, USA  
Natural Research Limited, Scotland, UK  
Rainforest Concern, London, UK  
Rufford Foundation, London, UK  
Mrs. Rohini Nilekani, Bangalore, India  
Schinger Foundation, California, USA  
Sehgal Family Foundation, USA

Swedish International Development Agency, Stockholm  
South Eastern Louisiana University, Hammond, USA  
Sir Dorabji Tata Trust, Mumbai, Maharashtra, India  
TVS Motor Company Limited, Chennai, India  
United Nations Development Programme, New Delhi, India  
United Nations Educational Scientific and Cultural Organisation, New Delhi, India  
University of Hawaii, Hawaii, USA  
United States Fish and Wildlife Service, Virginia, USA  
Vakil Housing Corporation Limited, Bangalore, Karnataka, India  
World Bank, Washington DC, USA  
World Wide Fund for Nature, New Delhi, India  
World Wildlife Fund, Kathmandu, Nepal

## financial statement

### Balance Sheet as on 31st March 2008

Sources of funds	In INR as on 31-03-08
Corpus fund	85,488,036
Utilized reserve	24,458,928
Building fund	12,052,654
General fund	28,624,671
<b>Current liabilities</b>	
Project fund	46,744,183
Provision for expenses	944,466
<b>Total</b>	<b>198,312,938</b>
<b>Application of funds</b>	
Corpus investments	86,298,366
ATREE assets	8,607,548
Project assets	24,458,928
Building in progress	25,372,880
Investments	31,576,217
Current assets	
Advances	1,781,487
Other current assets	3,076,249
Cash on hand	272,815
Bank balances	16,868,448
<b>Total</b>	<b>198,312,938</b>

## Income &amp; Expenditure Account for the year ended 31st March 2008

Income	In INR as on 31-03-08
Project income	60,922,307
Other income	
Donations	735,024
Interest	996,945
Others	1,210,000
<b>Total</b>	<b>63,864,276</b>
<b>Expenditure</b>	
Programme and administrative expenses	22,358,440
Salaries	29,019,616
Travel and field transportation	10,682,769
Excess of income over expenditure	1,803,451
<b>Total</b>	<b>63,864,276</b>

**Note:**

The activities reported in the annual report are for the period April 2007 to December 2008.  
The financial statement follows the financial year April 2007 to March 2008.

## **vision** statement

A society committed to environmental conservation  
and sustainable development.

## **core** values

Promotion of diversity

Integrity

Transparency

Intellectual freedom

Social accountability

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Look us up at [www.atree.org](http://www.atree.org) or contact us at [info@atree.org](mailto:info@atree.org).

Donations to ATREE in India are 100 % tax-exempt, under sections 35 (i) & (ii) of the Indian Income Tax Act.

ATREE is a Centre of Excellence in Conservation Science, recognized by the Government of India. ATREE is also a Scientific and Industrial Research Organization, recognized by the Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India.



