



Annual Report  
2010-2011

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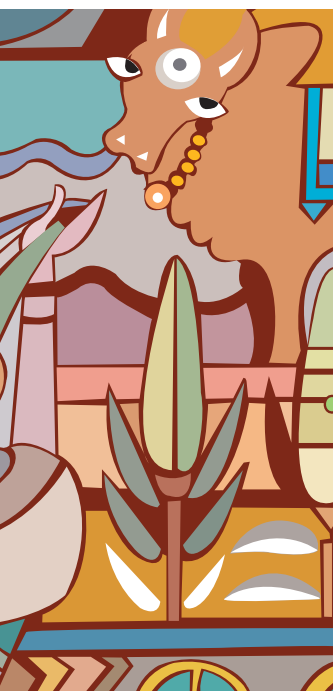
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# Conservation

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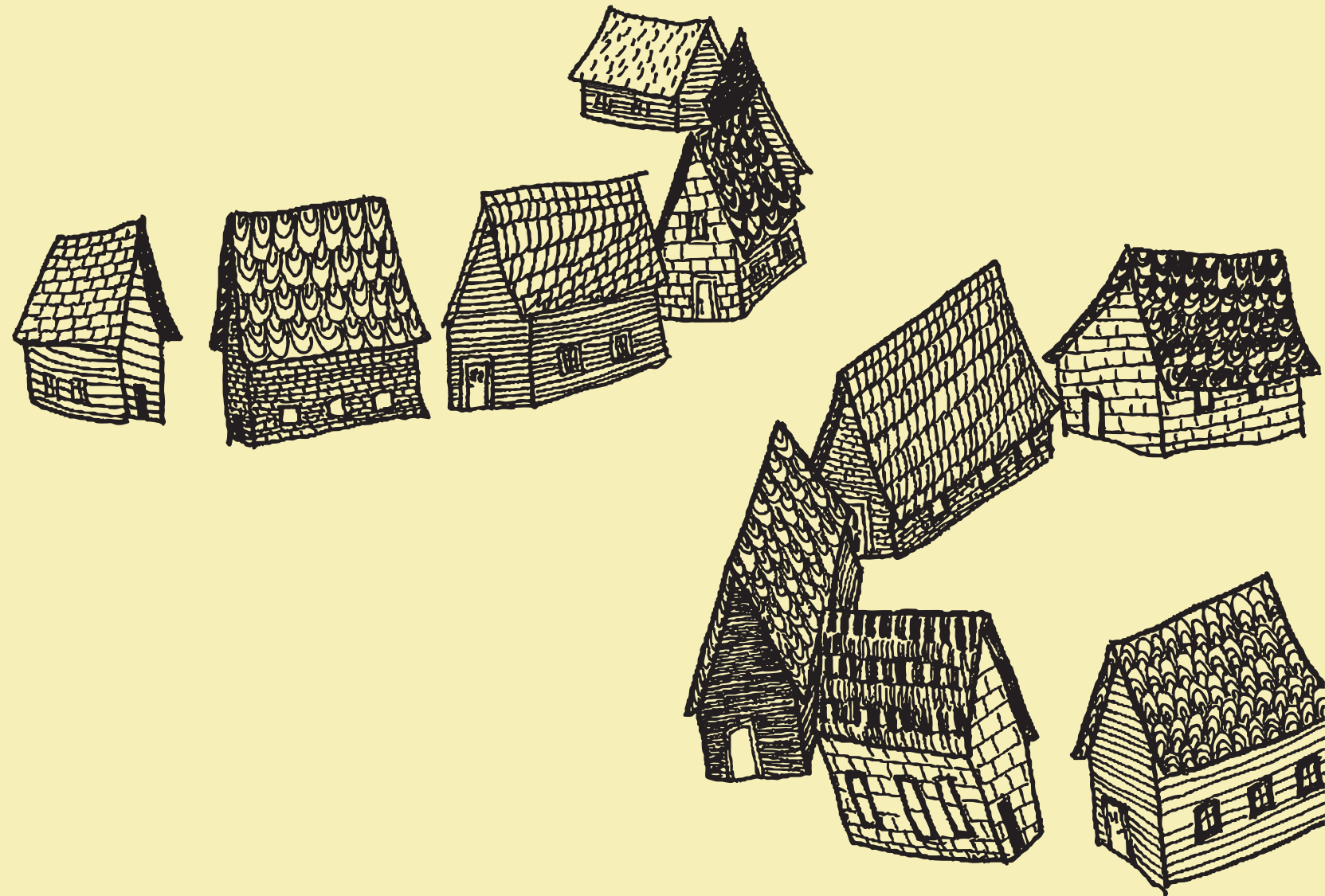
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# President's Message

## Knowledge, Action and Policy

We live in an era of explosive growth in knowledge and information. Recent years have witnessed a sharp increase in knowledge-based organisations, professional journals and means for dissemination of information. Yet problems persist in almost every sphere of human endeavour. This is particularly true for human interactions with the environment. Among the many reasons for continuing deterioration of the environment is that much of the knowledge we generate is not immediately usable.

The challenge for ATREE is to produce knowledge that can be quickly applied to problems arising from interactions among society, nature and development. We can address this challenge by generating knowledge that can result in actions to improve the environment and guide sustainable development, by impacting developmental and environmental policies, and by imparting knowledge to a new generation of environmental leaders, who can help resolve our most pressing problems.

As this report indicates, ATREE has made strong efforts to meet the challenge of what one might call the deficit of useful knowledge—knowledge that results in concrete benefits to society through linkage with policy and action.

During the last year, with generous grants from Rohini Nilekani, Suri Sehgal, Kumari Shibulal, Jamsetji Tata Trust, and MacArthur Foundation, our most ardent supporters, ATREE has focused on increasing the impact of our work on society's interaction with the environment. We have had retreats, workshops and meetings to reflect on our work and the ways by which we can make it more relevant to policy makers and civil society.

We have a long way to go, but we have made progress. During the last year, ATREE has significantly affected the discourse on Forest Rights Act by

interacting with policymakers on the one hand and conservation community on the other. Action-oriented research, and work with local community-based organisations in the Eastern Himalayas are beginning to have a significant effect. Our interdisciplinary doctoral programme in conservation and sustainability science continues to make strides in strengthening the country's human resources.

However, significant challenges remain, especially in generating usable knowledge, and ATREE's relevance will largely depend upon our ability to meet these challenges. This calls for innovation in the ideas we pursue and translating what we learn into action to build capacity, influence policy, engage civil society and improve environment. How we do this will determine our future.

We have benefited immensely from the support of our colleagues, friends, and supporters and are positioned to make a significant impact on the society–environment interface. We hope this support will continue. As in the past, we welcome inputs and suggestions from our friends and donors to make ATREE an innovative, effective and a relevant organisation.

**Kamaljit S. Bawa**  
President



## From the Director's Desk



As climate change, globalisation and the global communication revolution rapidly blur the lines between local and global, between modern and traditional, the demand for relevant and integrated knowledge to address emerging challenges in environment and conservation is far more urgent now than ever before. We need a new generation of thinkers and doers, who are able to integrate across conventional sectors and disciplines and contribute to lasting environmental solutions.

ATREE continues its efforts to address these growing challenges through its innovative interdisciplinary research, education and outreach.



This year has seen creative and relevant research conducted by my colleagues to help shape thinking and practice in promoting environmental sustainability. ATREE researchers have contributed to a global multi-country study on the impacts of policies on sustainability of land-use. The India focus was on the sustainability of small farms. One of the key outputs of this study was an integrated impact assessment methodology which could inform the planning and policy process. Another study showed that *Jatropha* – a highly promoted biofuel crop – does not deliver on the ground in several dimensions, therefore questioning the policies that continue to promote it.

Long-term monitoring of ecosystem change is vital for adaptive and effective management of protected areas and, at a larger scale, provides information that feeds into policy level responses to change. Our long-term work in Biligiri Rangaswamy Hills, along with key local stakeholders, outlines a proposal for collaborative management of the Biligiri Rangaswamy Temple (BRT) Tiger Reserve in alignment with the Forest Rights Act (FRA) 2006. The alarming spread of lantana in BRT over the last 10 years may, in part, be related to a long history of fire suppression following forest protection.

This study, completed by ATREE's first graduating Ph D student, highlights the negative impact of lantana on native vegetation, and calls for incorporating fire as a management tool in lantana removal and forest restoration, along with continued monitoring.

Our long-term studies to understand ecosystem processes take on new significance under the current thrust to understand adaptation to climate change. In continuing efforts to link research with on-ground action, researchers have been working with farmers to provide effective perches for owls, and revitalise local knowledge on the role that owls play in rodent control in agricultural fields adjacent to forests. Such subtle but significant ecosystem services provided by forests highlight an aspect of the complex but poorly understood interactions on forest-agriculture edges.

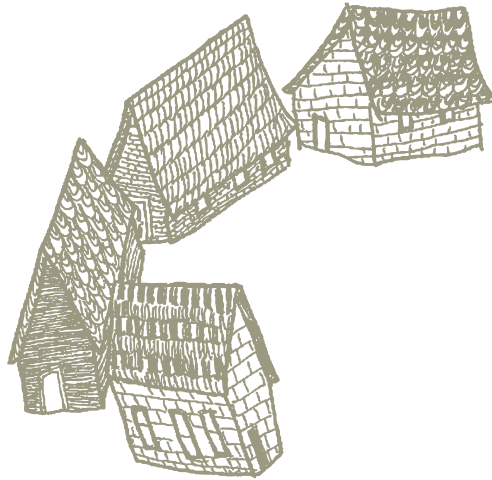
ATREE's educational efforts are impacting future leaders at several levels. The Academy for Conservation Science and Sustainability Studies will add another 10 students this year and see at least four students graduate from its Ph D programme. Our certificate courses are demand-driven, use interdisciplinary approaches, are highly relevant, and draw on the strengths of

our diverse natural and social science faculty. The courses for mid-career professionals on 'perspectives in environment and development' and 'geospatial tools for conservation' were well received. 'Conservation science' for undergraduate and post-graduate students, and 'bioresources, nature and society', for high school students were some of the popular annual courses offered by the Academy. ATREE's internship programme continues to attract bright students from around the world and India.

We invite you to get involved in the larger issues that are highlighted in this report through effective locally rooted networks and organisations. The challenges generated by rapid economic growth coupled with global change can be overwhelming, but we will remain committed and focused as we work together in strengthening capacities for sustainability and in reducing biodiversity decline in a socially inclusive manner. We appreciate your support and goodwill and look forward to continued engagement in the future.

**Gladwin Joseph**  
Director, ATREE  
June 2011

# Research



## Centre for Environment and Development

Human use of earth's natural resources is placing unmatched pressure on the capacities of local and global ecosystems.

In south Asia, the subsistence needs of a large rural population and the demands of a growing industrial sector and consumer class on forests, water resources and agricultural lands are generating both resource degradation and conflict. At the same time, the conventional development paradigm of rapid industrialisation and urbanisation, supposedly leading to poverty alleviation, is generating air, water and solid waste pollution and affecting human lives and ecosystem health at multiple scales.

The brunt of both resource degradation and pollution is most heavily felt by the urban and rural poor. How the process of development – economic, technological, socio-cultural and political – can lead to sustainable and equitable use of natural resources and containment of the pollution burden, and how sustainable resource management can contribute to poverty alleviation and human well-being are the broad questions that drive the work of the Centre for Environment and Development.

Centre Convenor: Sharachchandra Lele

## Land, Water and Livelihoods

Rapid increases in irrigated agriculture and industrial production have subjected south Asia's land and water resources to immense stress and conflicts between agricultural, domestic and industrial stakeholders. Reducing such stress and resolving conflicts require an understanding of the linkages between the state of land and water resources, use and demand by different sectors, and social, cultural, economic and political processes affecting practices, policies and decision making.

Research within the Land, Water and Livelihoods group is focused on two broad thematic areas – Agrarian Dynamics, and Water and Livelihoods. These two themes cover a range of issues, including sustainability of small farming systems, interactions between agricultural and domestic water-use practices, livelihood systems in resource-stressed agricultural regions; direction and drivers of change in water availability, and related policies. Research initiatives engage with ATREE's cross-cutting thematic areas of governance and climate change.

Primary faculty: Bejoy K. Thomas, Seema Purushothaman, Shrinivas Badiger (Programme leader), Siddhartha Krishnan

Secondary affiliations: Sharachchandra Lele

### 1

#### Understanding the agrarian crisis

Despite a fast growing economy and a notable budgetary allocation to agriculture, the agricultural sector in India is on the decline. The problems are reflected in reduced contribution from agriculture to the Gross Domestic Product and the vulnerable livelihood status of farm families with small holdings. Among the states in India, Karnataka reported the second highest



Seema Purushothaman

number of farmer suicides in the last decade. The landholding size here has decreased to its current average size of less than two hectares, along with a significant shift towards commercial crops.

As part of a larger consortium project – LUPIS (Land Use Policies and Sustainable Development in Developing Countries) – concluded in March 2011, ATREE assessed the sustainability of small farms in Karnataka in order to draw inferences for policy dialogue. The study examined major trends in land-use change at state and district levels from 1966 to 2008. The period was divided into three distinct phases: Green Revolution period (1966–1976), post Green Revolution period (1977–1992) and the liberalisation period (1992 onwards). Based on this analysis of temporal change in cropping pattern, and incidence of farmers’ suicides, five districts were selected across important bio-geographic zones for a micro-level analysis. Also identified were a comprehensive set of policies in implementation that affect agricultural land-use. The integrated sustainability impact assessment at different spatial scales comprised comparative static

approaches with three-stage least-square models, multi-criteria and participatory techniques, and institutional assessment. The study has provided new insights into integration of methods for projecting trends in sustainability of production landscapes with dynamic variables and for assessing trends in the different dimensions of sustainability of small farms in varying scenarios.

Follow-up studies have been planned based on the learning. One of the studies will explore simulation of change in sustainability into the future using spatially explicit tools, with input data from previous assessments of institutional effectiveness and participatory impact assessment. Another study will look at building more scenarios and linking the results to explore adaptation in crop patterns and production techniques in agro-climatic zones. The third study will explore the potential of different payment mechanisms (regulatory, market-based and others) to help sustainability of small-scale agriculture.

If you are interested in more details of this project, please visit [www.lupis.eu](http://www.lupis.eu)



Narendra V Killada

## 2 Water and human health

The Vembanad estuarine system, a Ramsar site, and its surrounding paddy belt of Kuttanad represent a complex socio-ecological system comprising backwaters, natural and man-made canals, lagoons and reclaimed land on which approximately 1.6 million people in 40 village panchayats depend for their livelihood.



This context requires a comprehensive understanding of the hydrology, water quality issues and socio-economic dynamics in the region. Ongoing research focuses on the linkages between water quality and human well-being and associated vulnerabilities. In its framework and execution, the study brings together spatially-explicit information on the dynamically inter-related biophysical and socio-economic factors in this complex, managed system. In doing so, it cuts across multiple thematic and sectoral boundaries that include hydrology, geography, epidemiology, sociology and economics.

The approach has been to map the interconnections between scales by beginning with coarse-scale spatial analysis, drawing from geography and hydrology, and moving at a later stage to site-specific and household-specific analyses using ethnographic and survey methods. It uses health as a contextually significant indicator of well-being.

The team started with a spatial and on-the-ground identification of health vulnerable geographic 'hotspots'.

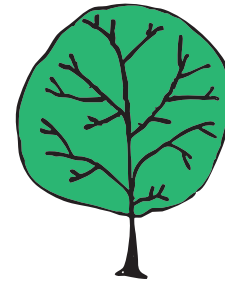
Once these were identified, the focus shifted to the household level to investigate how people are affected by, and cope with health vulnerability. Linkages are being established with the regional medical college, managed by the state government, to access health data and draw upon epidemiological expertise, and with the Integrated Child Development Services and local *anganwadis* for health and well-being information, particularly water-borne diseases. The team has been gathering primary water quality data, and is in the process of acquiring secondary water quality information from local environmental researchers and colleges.

Preliminary observations point to the crucial role of state intervention in ensuring better health outcomes and improved well-being at the household level in the region.

However, a disturbing observation is the continued dependence of poor households on exploitative informal sources of support (such as local moneylenders) in coping with illnesses, despite the presence of a large number of self-help groups.

### 3 Jatropha is neither viable nor pro-poor

Researchers, policymakers and civil society organisations have been highlighting the potential of biofuels as partial renewable substitutes for fossil fuels, thereby mitigating climate change, while also alleviating rural poverty because of their viability on marginal lands. A recent study by researchers from the University of Barcelona and ATREE (published in two parts in

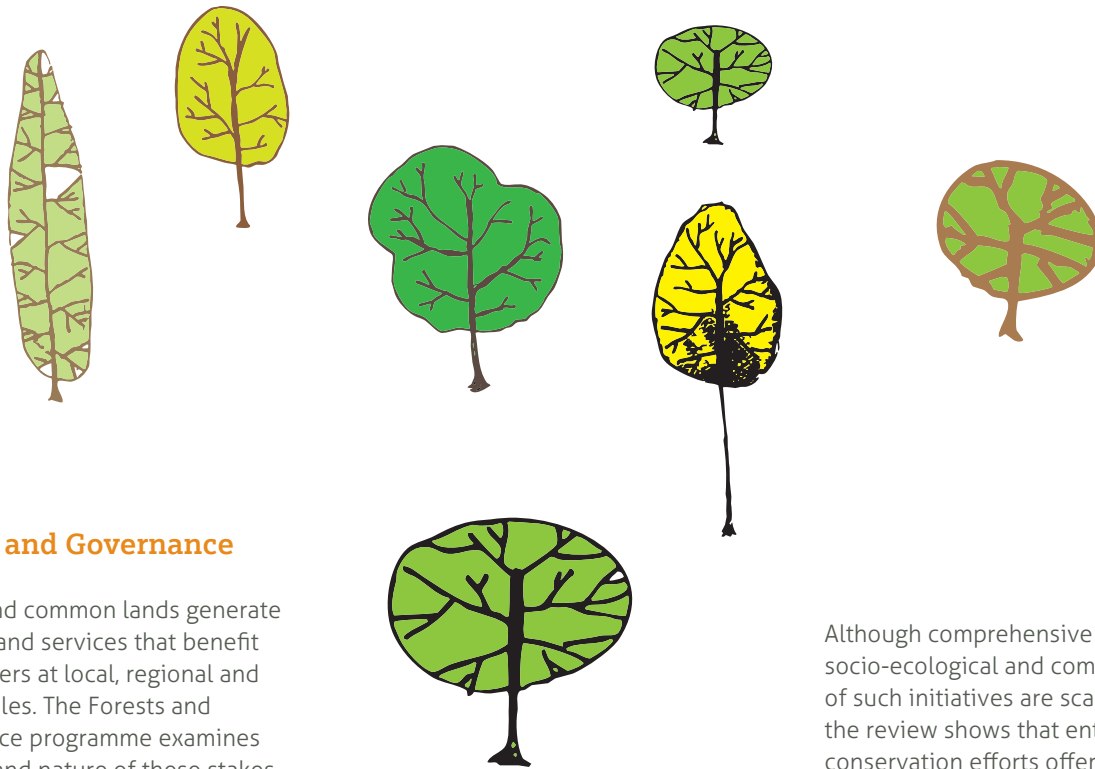


*Ecological Economics and Journal of Peasant Studies*), however, raises serious questions about the basic economic viability as well as the pro-poor potential of *Jatropha*, an oilseed-based biofuel crop strongly promoted by the Government of India and other countries.

The study assessed the agronomic and economic viability and livelihood impacts of *Jatropha curcas* plantations on private farms in Coimbatore and Thiruvannamalai districts of Tamil Nadu, India. It found that *Jatropha* yields are much lower than expected and its cultivation is currently unviable, and even its potential viability is strongly determined by access to surplus land and water. Moreover, *Jatropha* cultivation replaces crops such as groundnut that provide some food security, and others that provide firewood as a byproduct, creating significant livelihood tradeoffs. *Jatropha* cultivation therefore not only fails to alleviate poverty, but its aggressive and misguided promotion is likely to generate conflict between the state and the farmers, between different socio-economic classes and even within households.

From a larger public policy perspective, the subsidies and other support provided for *Jatropha* may be misplaced. The benefits flow to biofuel companies, not to the farmers. Moreover, the energy return on investment is low, conversion of land-use from food crops to *Jatropha* has negative public welfare implications, and the competitive demand for water has negative sustainability implications for society.





## Forests and Governance

Forests and common lands generate products and services that benefit stakeholders at local, regional and global scales. The Forests and Governance programme examines the form and nature of these stakes and how these stakes might be compared and prioritised; how current attempts to define stakes and decentralise institutional arrangements and regulate forest loss are actually playing out; and how forest governance could better reconcile competing claims and multiple stakes. The Forests and Governance programme at ATREE focuses on these questions in the context of the forests of south Asia.

The research themes are: the ecology of sustainable forest-use and extraction by local communities, the ethnography of traditional ecological knowledge, the economics of forest dependence and its variation under different forest governance regimes and socio-political contexts, and the institutional and legal analyses of existing and proposed changes in forest governance.

Primary faculty: Ashokankur Datta, Nitin Rai, Sharachandra Lele (Programme leader), Siddappa Setty, Subhrajit Saha (till March 2011), Swati Shresth

### 1 Alternative approaches to conservation

An exclusionary Protected Area-based approach continues to dominate global biodiversity conservation efforts. Although some attempts at reform and inclusion have been made, most conservation initiatives are still variations of the 'fortress conservation' theme, and have resulted in significant social costs and conflicts, especially in the developing world. A review by ATREE researchers and collaborators examined the potential of other approaches that value biodiversity as well as socio-economic gains, in particular community-based conservation, and its subset – enterprise-based conservation, and payments-based conservation programmes.

Although comprehensive socio-ecological and comparative studies of such initiatives are scarce, the review shows that enterprise-based conservation efforts offer some potential if aspects related to the project design, implementation, assumptions about communities, and tenurial change and security are addressed. The study advises a more cautious approach to the current trend of payments-based conservation programmes, or payments for ecosystem services, because of their focus on economic efficiency, and simplified assumptions regarding the nature of rights, biological information, monitoring costs and state interventions. Lastly, it points out that alternatives to exclusion lack adequate state support and space to function; and neoliberalisation of the political-economic system is not conducive to giving them that space, except when they fit the direction of this larger process.

Forests and governance researchers are currently engaged in assessing the potential of eco-tourism as a source of alternative livelihood for tribal communities, using BR Hills as a case study.

## 2

### Decentralising forest governance

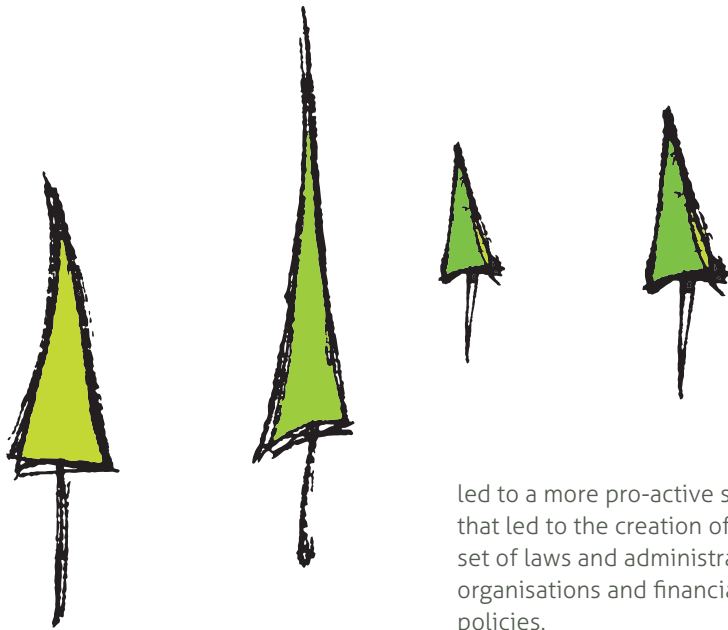
Recognition of Forest Rights Act (RFRA) 2006 recognises the historic injustice to forest dwellers whose traditional lands were expropriated for protected areas and reserved forests. It grants indigenous communities and forest dwellers access to land they have been cultivating and forest resources they have been using, and marks an important step towards decentralised forest governance.

A commentary by ATREE researchers and collaborators from National University of Singapore looks at the spaces enabled by the RFRA and the potential it holds for transforming local governance, especially in the context of protected areas.

It calls for implementation and enforcement of the Act, aligning other forest policies with the RFRA, allowing time for communities to interpret and implement the Act through local institutions, and for aligning local knowledge with conservation science.

It proposes that the process of conservation be re-envisioned to include political empowerment of people, restitution of rights and human dignity, and building of local institutions. This human-rights-based approach, it suggests, increases the role of local communities in conservation and the potential for democratic governance of natural resources; and that efforts based on local knowledge, institutions and practices will empower local communities to better manage biological diversity.

Faculty from the Forests and Governance programme have also been involved in assessing the implementation of the RFRA across India as part of a Government of India



committee (see page 43). They are also currently engaged in supporting and monitoring the implementation of the RFRA in several locations in Karnataka and in studying the impact of the National Rural Employment Guarantee Act on tribal livelihood and participation in the RFRA.

## 3

### NTFP policy: rhetoric and reality

The collection and sale of non-timber forest produce (NTFP) contributes significantly to the livelihood of several million people in rural India, especially forest-dwelling tribal communities. ATREE researchers and collaborators examined the NTFP policy in India, using macro-analyses from states in the central-eastern forest belt and case studies from the Western Ghats. They critically analysed the objectives, both stated and implicit, the instruments used and the impacts on the livelihood of the collectors and ecological sustainability of the resources.

The role of NTFPs in the livelihood of forest-dwelling communities began to gain the attention of policymakers in the 1950s and was followed by protests against exploitative and revenue-oriented state policies. These pressures

led to a more pro-active state policy that led to the creation of a complex set of laws and administrative orders, organisations and financial support policies.

However, these changes were driven by a desire to appropriate the maximum possible surplus for the state while continuing to pay lip service to the interests of collectors. Bureaucratic interference and control of the cooperatives and of cooperative federations so created, and the lack of secure rights to collectors further limited the gains accruing to NTFP collectors. The second part of the review studies the sustainability of NTFP harvests. Here it suggests that while the open-access nature of most harvests, and the lack of monitoring and incorporation of local knowledge into their management imply unsustainable harvesting, the complex ecology of the products makes impacts unpredictable. Strengthening NTFP-based livelihoods for forest-dwelling communities in an ecologically sustainable and economically viable manner continues to be a major challenge in India.

Forests and governance researchers are now engaged in a detailed study of NTFP cooperatives in Madhya Pradesh, in long-term monitoring of NTFP ecologies in BR Hills and other locations, and in assessing the changes in magnitude and distribution of forest benefits across scales and sectors under changed forest governance in Orissa.

# Research

## Suri Sehgal Centre for Biodiversity and Conservation

This Centre aims to build a critical body of knowledge about India's biodiversity, ecosystem functions and ecosystem services of natural and managed ecosystems in the context of global, regional and local change.

We believe that understanding the role of biodiversity and ecosystem functions in sustaining human welfare is crucial to galvanising conservation awareness and eliciting civil society support for conservation. Recognising the structure, function and value of biodiversity will enable us to prioritise outreach activities and natural resource management initiatives.

Centre Convenor: Jagdish Krishnaswamy

## Ecosystems and Global Change

The Ecosystems and Global Change programme addresses gaps in knowledge in understanding patterns of occurrence of biodiversity, changes in biodiversity over time, and the consequences of biodiversity loss for ecosystem functioning and ecosystem services. The programme aims to inform policy and governance mechanisms regarding the feedbacks and linkages between human interventions and processes such as climate change, urbanisation, deforestation, spread of invasive species and diseases.

This programme has four thematic working groups: Systematic Biology, Monitoring and Managing Ecosystem Change, Conservation Planning and Society and Urban Ecology.

These themes form an umbrella for studies on taxonomic scrutiny of biota, understanding the structure and functioning of ecosystems, impact of invasive species and other anthropogenic factors including climate change on ecosystems and human well-being, and management responses to changes in ecosystems.

Primary faculty: Ankila Hiremath (Co-Programme leader), Aravind N. A., D. R. Priyadarsanan (Co-Programme leader), G. Ravikanth, R. Ganesan, T. Ganesh

Secondary affiliations: Jagdish Krishnaswamy, Nitin Rai, Shrinivas Badiger, Soubadra Devy

## 1

### World Heritage status for the Western Ghats

In 2006, 39 sites in seven sub-clusters of the Western Ghats were identified and proposed as a potential UNESCO World Natural Heritage Cluster Site. The proposal was made by the Ministry of Environment and Forests, based on expert inputs from ATREE, Nature Conservation Foundation, Mysore and Wildlife Institute of India, Dehra Dun. The Ecoinformatics Lab provided the spatial database and Geographic Information System (GIS) support for ATREE's contribution.

As part of the process of declaring a proposed area a heritage site, a team of UNESCO-appointed International Union for Conservation of Nature (IUCN) representatives came to India in October 2010 to evaluate the scientific, technical and administrative aspects of the proposal. ATREE facilitated the team's interaction with civil society experts and community.

The cluster of sites being considered for nomination are in the landscapes of Agasthyamalai, Periyar, Anamalai, Nilgiris, Upper Cauvery in Kodagu, Kudremukh and Sahyadri. This proposed Western Ghats cluster site is spread across six states in peninsular India and includes 60 important bird areas. It is home to 325 globally threatened species, harbours many endemic species and provides important local, regional





Bhaskar Acharya

and global ecosystem services; especially climate regulation, sediment control, hydrological services and carbon storage.

It is important that the varied ecosystems contained here remain intact because of their historical and local, regional and global values.

*Western Ghats: a rich and diverse natural heritage*



Bhaskar Acharya



## 2

### The lantana invasion

Invasive alien species are a subset of the vast variety of plants, animals and pathogens that humans have moved around the world, whether deliberately or inadvertently. Some of them have spread rapidly, colonising landscapes and out-competing native diversity, and causing untold ecological and economic damage. In a long-term study of one such invasive plant, ATREE researchers assessed change in *Lantana camara* (hereafter, lantana) distributions over an 11-year period (1997 to 2008) across 540 km<sup>2</sup> of the Biligiri Rangaswamy Temple (BRT) Wildlife Sanctuary, Karnataka.

The study reveals a dramatic increase in both abundance and density of lantana, with the invasive species having practically doubled in extent over this period. This spread has been accompanied by reductions in the density and diversity of native plants along with a significant increase in the density of lantana. Of particular concern is the reduction in the regenerating size classes of trees, suggesting that tree population declines may occur in the future. A separate study by ATREE researchers in the Male Mahadeshwara Hills (MM Hills) adjoining BRT has revealed adverse impacts of lantana on bird species diversity, species richness and abundance, indicating that the negative effects of lantana invasions may not be restricted to plants alone.

Scientific literature on invasive species suggests that disturbances such as resource extraction, forest fires, roads, and slash-and-burn practices can make ecosystems more vulnerable to species invasions. The BRT study showed that lantana spread is best explained by proximity to seed sources, rather than disturbance, so forests adjoining already invaded sites are most likely to be invaded. The study also found that lantana establishment (defined as an increase in either relative or absolute density of lantana) was related to the degree of deciduousness, and the distance from edges, as has been shown by others also. But the factor that seemed to have the greatest influence on lantana spread was the absence of fire. This is surprising, since previous studies have hypothesised that an increase in fire occurrence could potentially benefit lantana. In a related study although, ATREE researchers found that lantana seeds stored in the soil are killed by fire, possibly reducing the potential for lantana colonisation and spread in areas that are burnt.

In a unique approach, the study compared results from the scientific research to traditional knowledge about lantana. Soliga elders cite three major reasons for lantana's spread: copious fruiting and wide dispersal, historical extraction of grass and bamboo, and

cessation of the Soliga's use of fire as a forest management tool after BRT was declared a wildlife sanctuary in the mid-1970s. According to the Soligas, the nature of the lantana–fire relationship depends on lantana abundance. At low densities, early dry-season fires prevent lantana from spreading. At high densities, on the other hand, fire was seen as beneficial for invasion, since fires in lantana-invaded areas are very intense and thus can kill native tree species.

Blending scientific knowledge with traditional ecological knowledge has enriched our understanding of lantana invasions. The role of propagule pressure and the effect of lantana on native tree communities were validated by both traditional and scientific knowledge. The role of fire in controlling lantana invasion, as held by the Soligas, was contradictory to earlier thinking about the lantana–fire relationship, but was borne out by this study. These findings highlight the importance of examining information from scientific and traditional sources side-by-side and illustrate the potential for current forest management practices to benefit from such a collaborative approach.

### 3

#### A city's green and blue spaces

Bengaluru, once known as the 'garden city' of India, obtained its image because of its vast green spaces, which comprise parks, tree-lined avenues and large institutional campuses.

Rapid development has resulted in the deterioration of green spaces within the city. In the context of emphasising the importance of green spaces, studies by ATREE researchers on neighbourhood parks in the city reveal that parks provide innumerable services to citizens. Various stakeholders, from park users to the neighbourhood community, vegetable vendors and gardeners benefit from the ecosystem services that parks deliver. Despite the critical functions that neighbourhood parks play, the larger heritage parks seem to attract greater attention as people believe that they offer greater services. As a result, the services provided by small neighbourhood parks are often undervalued. The study highlights the importance of these smaller green spaces, not only in terms of the recreational services they provide, but also in the supporting biodiversity and livelihood services.

In another study, ATREE researchers studied the distribution of street trees, to assess differences in density, size and species composition across roads of varying widths, and changes in planting practices over time.

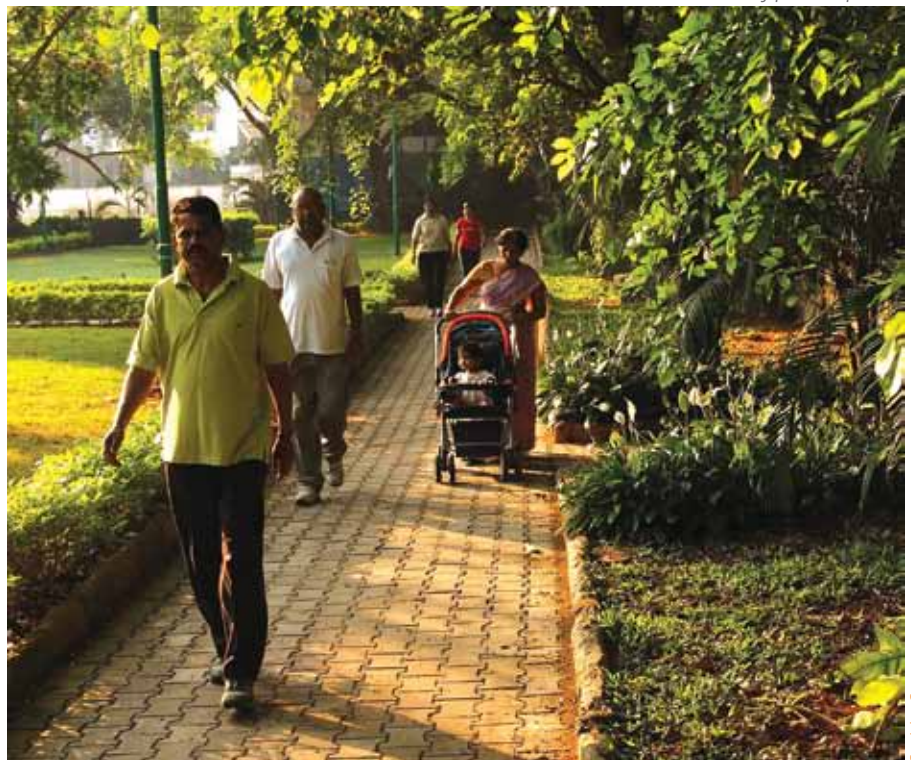
A major concern is that the city's street tree population is being selectively denuded of its largest trees, mostly felled for road widening. This has implications for the city's environmental and ecological health: older trees have a more diverse distribution with several large-sized species, while young trees belong to a less-diverse species set, largely dominated by small-statured species with narrow canopies.

The latter have a lower capacity to absorb atmospheric pollutants, mitigate urban heat island effects, stabilise soil, prevent ground water runoff and sequester carbon. The study highlights the need to protect large street trees on wide roads from felling, and to select an appropriate and diverse mix of large and small-sized tree species for new planting.

The city's growth has also impacted its wetlands. A separate study examined

how transformations in land-use and governance consequent to urbanisation can change people's perceptions of and interactions with an urban ecological commons. Using the case study of Agara Lake, it shows how, in less than four decades; the landscape surrounding the lake has altered from a fundamentally agricultural area, dependent on the lake for irrigation and drinking water, to a densely urbanised area where the lake is used predominantly for recreation. Change in governance from community management to state management has marginalised fisherfolk, fodder collectors and farmers who traditionally maintained the lake; and transformed it from a multi-use common property resource to an urban recreation space. This study shows how changes in governance resulting from urbanisation and city expansion can impact interactions between people and ecological commons in a rapidly growing Indian city.

*Value of public spaces*



Savitha Swamy

## 4

### The recovery of Manas

Manas National Park has benefitted from the relative calm and decline in violence following the 2003 ceasefire agreement between the Bodo Liberation Tigers, the Assam government and the Centre. The situation has shown such marked improvement that UNESCO might drop Manas National Park from the 'in danger' list of world natural heritage sites.

The conflict severely affected scientific monitoring and management of the Park. It has resulted in significant data gaps on wildlife populations and hampered the preparation of a heritage site management plan. ATREE is working with other partners to generate information to fill these gaps. A study by ATREE in 2008 compared tiger and prey densities of Manas with tiger reserves in Pench, Nagarhole, Kaziranga and Kanha. The results showed that while Manas had a low abundance of tigers compared to the others, it had a healthy prey population that could potentially sustain more tigers.

In 2010, ATREE initiated full-fledged camera-trapping activity for estimating wildlife/tiger populations in Manas. This is a collaborative effort with Aaranyak and WWF-India, carried out under the supervision of Manas Tiger Project/Assam Forest Department.

The research protocol follows the guidelines prescribed by the National Tiger Conservation Authority and Wildlife Institute of India. The results will contribute to the all-India tiger estimation efforts. A trans-boundary component of this initiative also simultaneously surveyed areas contiguous with Manas on the Bhutan side (Royal Manas National Park).



*Caught on camera*

The camera-traps have captured key species found in Manas, including the tiger, leopard, wild dog, gaur, wild buffalo, elephant, wild boar, barking deer, sambar and porcupine, among others.

The presence of the apex predator and other sympatric carnivore species, along with a diverse prey base, indicates survival and recovery of these endangered species in a landscape which was politically disturbed and 'in danger' just a few years ago.







## Ecosystem Services and Human Well-being

Ecosystem services are the direct and indirect contributions of ecosystems to human well-being. These can be provisioning services of food, water, timber, fibre and genetic resources; regulating services such as regulation of climate, floods, drought, land degradation, water quality and disease prevention; supporting services such as soil formation, pollination and nutrient cycling; and cultural services such as recreational, spiritual and religious benefits.

There are a number of examples of the loss of ecosystem services due to and/or associated with the loss of biodiversity and unsustainable development.

The Ecosystem Services and Human Well-being programme aims to understand and evaluate a range of services that sustain human welfare, and forward the economic worth of ecosystem services as an argument for conservation and pragmatic use of an asset. The programme aims to inspire awareness and appreciation of the benefits accrued from the environment.

Areas of research include the role of ecosystem services in local land-use planning and decision making; socio-ecological, and economic importance of ecosystem services, and their role in promoting equity and environmental justice; political and societal support for enhancing ecosystem services.

Primary faculty: Jagdish Krishnaswamy (Programme leader), Soubadra Devy

Secondary affiliations: D. R. Priyadarsanan, Seema Purushothaman, T. Ganesh

### 1 Taking stock: soil carbon in Western Ghats forests

Carbon stored in soils is a major global reservoir for terrestrial carbon, and carbon emission from destruction and degradation of tropical forest ecosystems and soils is among the largest sources of carbon dioxide

emissions to the Earth's atmosphere. Therefore, avoiding deforestation and degradation is one important way to decrease carbon dioxide emissions to the atmosphere. Carbon held in forest vegetation and soils constitutes an important service provided by forest ecosystems, which could potentially benefit local communities and forest managers who maintain and conserve these ecosystems.

Although reduced carbon emissions are recognised as a compelling reason to prevent deforestation, there is a need for quality data to influence policies that favour land-use and land-cover that maintain soil carbon. Current estimates of soil carbon are based on limited data, and are not segregated by the drivers that affect soil carbon.

ATREE researchers are carrying out a two-phase study to quantify and map the distribution of carbon in soils and vegetation for the Western Ghats.

In the first stage, we conducted a literature review to collect information

on published data on soil carbon from the region, collating secondary data from published sources, institutions and individual researchers to assemble a comprehensive data set on soil carbon – concentrating on forest and grassland ecosystems, and also on a few agro-ecosystems and tree-plantations.

Soil profiles from agricultural or non-forested landscapes were removed from the dataset and kept apart for separate analysis of carbon from crop lands and plantations.

The forest and grassland profiles were matched with coordinates using GIS tools to provide a more accurate map of soil carbon by landscape. Soil profiles with insufficient depth data were also weeded from the dataset.

The secondary data review and systemisation was carried out for 303 soil profiles collected between April 2009 and March 2010, and additional 91 profiles were added to this dataset between April 2010 and March 2011. These were assessed for compatibility and finally, a total of 307 soil profiles were selected for quantitative and spatial analyses. These included 287 for forested landscapes and 20 profiles for agro-ecosystems.

We have collaborated with French Institute, Pondicherry for GIS layers for surrogate data such as rainfall, elevation, soil type, and remotely-sensed surrogates for vegetation and eco-climatic distance; and with National Bureau of Soil Survey and Land Use Planning for soil maps of the Western Ghats. These will be used to study the relationship between soil carbon and each of the above co-variates and will help in creating carbon estimate models at the landscape level for Western Ghats.

The results of this investigation will be used to explore the relationship between the level of ecosystem services and factors such as forest type, climate, soil properties, management and human-use and disturbance. We hope to use this scientific data to better inform decision makers of the processes that help maintain carbon below ground for long-term policies and management interventions and as the basis for a socially just and equitable payment for ecosystem services, carbon credits or REDD+ instruments.

## 2 The value of beneficial predators

Quick-fix solutions sometimes undermine the healthier alternatives that ecosystems provide. In rice-dominated agrarian landscapes in Asia, rodents consume about 30 million tonnes of grain per year (Singleton 2003). In the agricultural

areas bordering the forests of Agasthyamalai; owls, snakes and rat trappers (an indigenous local community) have traditionally regulated rat populations in the paddy fields. However, these are now being replaced by seemingly easier alternatives such as rodenticides.

ATREE researchers, with a grant from the National Geographic Society, examined the agriculture–forest landscape next to the Kalakad–Mundanthurai Tiger Reserve in south India for the owl–rat relationship. Large owl species move between forests and fields to feed on rats. Traditionally, the farming community in this region provided perches in their fields for owls to hunt, but this practice is disappearing. People believe that owl populations have decreased and so they hire rat trappers to control rats, at a significant cost.

*Rat trappers are an expensive option*



M. Mathivanan

Eagle owls prefer the lesser bandicoot



The cheaper option is rodenticides, and indiscriminate use has poisoned soils, crops and water. Rats poisoned by anticoagulant pesticides die slowly and are an easy prey for large owls. The consumption of poisoned rats could adversely affect owls, leading to their decline. So the questions:

Are the owls, rats, humans caught in a vicious cycle of pesticide poisoning or are there other reasons that have led to the erosion of traditional options? Is it possible to revive the traditional perching system with the current owl populations?

Observation of owl calls indicated a fairly healthy population of eagle owls in the area, but not of barn owls and mottled wood owls. Eagle owls require large rocks, ravines or large trees with crevices for roosting and nesting, but the destruction of their habitats outside the reserve has confined them to the forests. It is the eagle owls that eat the lesser bandicoot or the mole rat, which is a major pest of paddy in the area.

Owls use taller, robust perches than those provided by farmers. Eagle owls are more frequently seen in the paddy fields during the harvest. This is when rats are frequently noticed in the fields and probably easy to catch as the fields are dry.

Therefore, even if owls do not use the perches that farmers place, their role in preying on rats at the harvest stage could significantly dent the rat population given the number of owls in the area and the rat species they consume.

Such knowledge can have wide ranging application across tropical regions to highlight the value of owls, snakes and other beneficial predators, and also appreciate the important services provided by adjoining forests.



# Education

## Academy for Conservation Science and Sustainability Studies

The Academy calendar comprises activities that cover environment and development education, awareness and skills training for doctoral students, academia, practitioners, professionals in government and non-government agencies, school students and lay public.

The range of established long-term and short-term courses are as follows.

- Doctoral programme
- Certificate courses
- Conservation education with schools
- Capacity building

### Doctoral Programme

ATREE has 23 full-time Ph D students, and is processing submissions for the 2011 batch. The teaching emphasis is on developing the flexibility to employ solutions from across disciplines to environmental and development concerns.

This is reflected in ATREE pedagogy and resources it makes available to students. Students' research themes range from studies on invasive species spread and management, to sociological and hydrological impacts of watershed development, community-based approaches to conservation and habitat restoration, study of freshwater fishes in the Himalayas, evolutionary ecology, to island biogeography and community ecology of birds and mammals, among others. The teaching emphasis is on developing the flexibility to approach environmental and development concerns in an interdisciplinary manner. The doctoral degree is awarded by Manipal University.



In order to strengthen resources in learning and academia, ATREE enters into strategic institutional partnerships. ATREE and Noragric, Norwegian University of Life Sciences, Aas, Norway have ended the first phase of one such collaboration featuring academic exchange, fellowships to students and faculty cooperation on applied interdisciplinary research. The partnership focused on tropical biodiversity and climate change in forest agricultural landscapes and mountains; and impacts on livelihood in the Western Ghats, Eastern Himalayas and Kutch.

In 2010, ATREE signed a Memorandum of Understanding with Oregon State University, USA to develop cooperation in teaching and research. This will include exchange of faculty, joint research activities, submission of joint proposals based on faculty interests to national and international funding agencies, participation in seminars and academic meetings, exchange of academic material and other information, special short-term academic programmes, and student exchange for research and study.

## Certificate Courses

### Conservation science course

The 'science' of conservation explained through lectures, field visits and hands-on research has been popular among students for its touch-feel-see quality of exposure to real-life field situations.



R Ganesan



Vivek Ramachandran

The course, conducted at Agasthyamalai in Tamil Nadu, was attended by 15 students.



Sandeep Sen

### Perspectives on environment and development

Mid-career professionals and researchers identified, interacted on and debated socio-economic and bio-physical concepts and applications in this week-long certificate course that ATREE conducts every year to develop an integrated approach to understanding issues that pertain to conservation, environment and development.

The course was attended by 13 individuals from various organisations across the country.

### Course on geospatial tools for conservation

The rigorous, individualised, hands-on training course in GIS and remote sensing for environmental conservation has become an annual offering of the Academy and ATREE's Ecoinformatics Lab.



Divin Murukesh

The course consists of theory and lab classes and a field session for learning Global Positioning System tools and techniques and is aimed at students and professionals. Eleven individuals from around the country participated in the course.



Divin Murukesh



Divin Murukesh

## Environment and Conservation Education



Abhisheka K

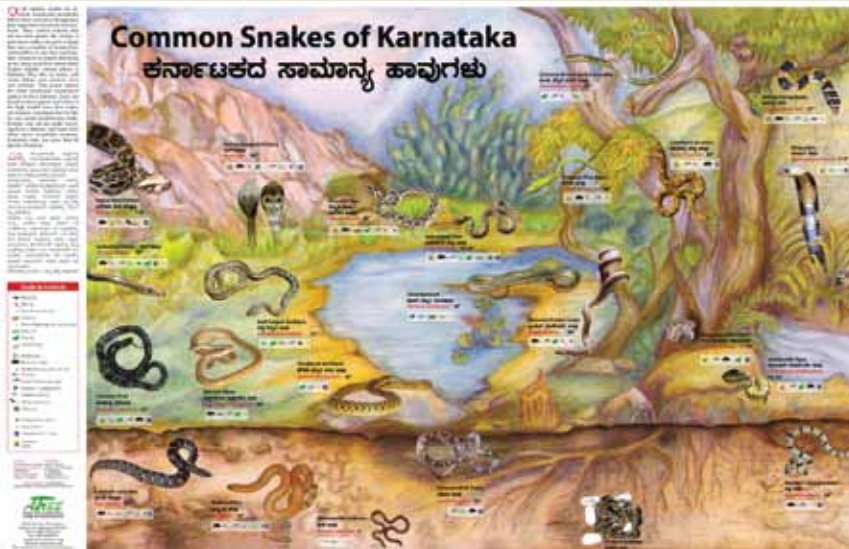
### DNA Club

ATREE is the resource organisation for the Karnataka chapter of the Department of Biotechnology Nature Awareness Club – DNA Club.

The theme for the end-of-the-year DNA Club schools' presentation was marine ecosystems. Students showcased the year's learning through posters, photographs, scientific models and products made of recycled material.



Abhisheka K



Earlier in the year, the DNA Club launched a bilingual newsletter 'Nesara' (meaning 'the rising sun') to share stories, poems, art, and concerns and observations related to bio-resources.

Ignorance is deadly for snakes. In a step towards making people more informed, less afraid, and therefore, less likely to kill a snake on sight; ATREE developed a poster on the commonly found snakes in Karnataka, with pictorial details of their diet, habitat and poisonous/non-poisonous character. These posters were distributed to schools in rural and urban areas.





Ashwini, volunteer

## Vacation Training Programme 2010

54% said they were inspired. The programme that inspired students included map reading, training in navigation skills, field classes, instructions in tree climbing, exercises in honing observation...

...talks by eminent scientists made up the Vacation Training Programme (VTP) for school students. The VTP objective is to seed interest in conservation issues in young, impressionable minds.



Abhishheka K

...visits to the BRT Wildlife Sanctuary, Ramanagara vulture nesting area, Ranganthittu bird sanctuary, Butterfly Park in Bannerghatta National Park and Navadarshanam – an eco-ashram...



Abhishheka K



### Visiting students

Twelve students from Kansas University, and 21 students from DePaul University, USA, visited the Kanakapura Community Conservation Centre (CCC) as part of their study-abroad course.

They learnt about rainfed agriculture, human–elephant conflict and habitat degradation.



Kavitha A.

Deepthi N

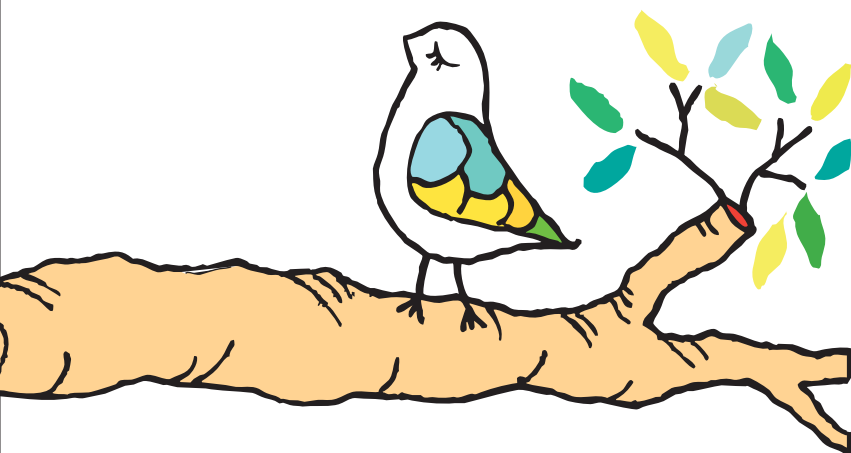


Deepthi N



Photo Credit: Kavitha A





## Capacity Building

One of the ways in which ATREE responds to the political environment and community requirements concerning conservation and development is through demand-driven workshops. These are based on specific circumstances and needs. In the past, we have held workshops on the FRA and its implementation for forest guards and tribal communities, workshops on building marketing networks for lantana products for forest-fringe dwellers, and conservation and livelihood workshops for self-help groups in the northeast. This year, we have conducted workshops that have enabled communities, governing bodies, academia and NGOs to participate in more informed ways in creating solutions at local, regional and national scales.

## Managing invasives

The Forest Department spends considerable time and resources to control the spread of invasive species such as *Lantana camara*, *Chromolaena odorata* and *Parthenium hysterophorus* in forest land. ATREE conducted a workshop with foresters in MM Hills area to discuss better ways of controlling the spread of such invasives.

One major outcome of this workshop was agreement between foresters and scientists on the process of removal and subsequent management of the area so that the invasive did not reappear. This was based on ATREE's studies in the field with *Lantana camara*.

Another key outcome was the generation of maps, based on information provided by the foresters, of the spread of four alien species in the ranges under their administration.



C Madegowda

Foresters are looking for answers to spread of invasives

## Pan regional collaborations for better canopy science

Canopy science requires a scale of infrastructural investments. The canopy is another terrain, a different ecosystem, and the biggest impediment to understanding the canopy better is safe access to the canopy. Cranes, walkways and towers are some of the methods of access, but they are expensive, require permissions, and need to be shared among the scientific fraternity to maximise their benefits to science.

Delegates from Bhutan and Sri Lanka, representatives from Karnataka, Tamil Nadu and Sikkim Forest Departments, and forest canopy scientists from India met in a two-day workshop to discuss how cross-border cooperation and partnerships with government agencies might improve canopy research installations and facilities across south Asia. The panel arrived at a working model for shared research and raising funds for canopy research besides building capacities of students in south Asian Association for Regional Cooperation countries.

This workshop was a follow-up to the 5th International Canopy Conference held in 2009 at ATREE, Bengaluru.

## Integrated ecosystem modelling

LUPIS at ATREE and Indian Society for Ecological Economics (INSEE) organised a workshop at Bengaluru for researchers working on integrated ecosystem modelling. Participants from Tunisia, Bangladesh, Netherlands, Indonesia, Kenya, Brazil and Germany presented their work on such models. The aim of the workshop was to identify robust methodologies for integrated ecosystem modelling.

The presentations focused on theoretical and applied perspectives on scale, allocation and distribution in integrated modelling. Case studies included theoretical models on tariff policy in land conversions, participatory impact assessments of land-use changes, impact of greenhouse gas emissions carried out at village level, multi-criteria analysis for assessment of impact of climate change on a watershed, and impact of changing policy on land ownership.

Presentations covered methods for comparing farming practices for sustainability, for explaining household behaviour amidst ecosystem changes, and ways of assessing the role of indigenous knowledge in sustainable use of natural resources.

## Practice and theory in habitat management

ATREE's UNESCO World Heritage Biodiversity Project, Assam and Indian Institute of Technology, Guwahati organised a seminar on habitat management where researchers presented papers on wildlife monitoring, human–elephant conflict and participatory conservation practices.



Nilmani Rabha

Participants exchanged views on the role of science in conservation, scope for

decentralised processes of conservation, and culture of conservation and conserving natural resources in the new economic and political era.



Ramesh Kannan

## Educators and the environment

As a parallel exercise to forming eco-clubs for school children in MM Hills, ATREE organised a workshop to orient teachers to the importance of conserving natural resources.

The three-day workshop introduced teachers to local biodiversity through bird watching, identification and mapping of trees around the school, a visit to a sacred grove and discussion on its conservation values and the need to conserve biodiversity. Invited speakers dealt with the role of schools in maintaining backyard gardens, developing plastic-free school premises, conducting anti-plastic campaigns in and around schools, keeping vermi-compost bins, and water harvesting. Thirty-four teachers participated in the workshop.



Chaitra KN, Government School, Kallankupe

## Students Wetland Congress

Vembanad Community Environmental Resource Centre (CERC) organised a Students Wetland Congress in February 2011. The aim was to encourage a scientific temperament and equip students to develop into good wetland conservationists in the future. There were several presentations by the Vembanad education outreach arm – *Jalapaadam*. The congress was attended by 105 students. The topics included assessment of mangroves, organic farming, water-borne diseases, fisheries resources.

## Talks @ATREE

Based on academic collaborations, goodwill and relationships with institutions and scientists, the Academy for Conservation Science and Sustainability Studies organises regular talks at ATREE.



Sumithra, Yelachavadi Higher Primary School

## 'Life through our eyes'

In an exercise to capture local practices and cultural exuberance of rural life in Kanakapura, ATREE partnered with International Photography Partnership (IPP), USA to use photography as a tool to document the culture and landscape through the eyes of rural children.



Prema, Yelachavadi Higher Primary School

ATREE, IPP and NIKON held a five-day photography workshop for kids in Kanakapura, called 'Life through our eyes'. Forty-one rural school children from two schools in Kanakapura participated in the workshop. Children were given themes such as school, home and family, livelihoods, health and nature. The resulting set of images helps in understanding practices and lifestyles and is an invaluable visual documentary of the people.

As a follow-up to the workshop, an exhibition of the photographs was held at the ATREE office in Bengaluru.



Prominent speakers this year have been Dr Margaret D. Lowman, on partnerships with non-traditional stakeholders to make conservation mechanisms more effective; Prof. C N R Rao, on Science in the Future of India; Dr Jesse Ribot, on how current forest management practices increase vulnerability and create poverty; and, Dr Kanchan Chopra, on managing transformational change.



## Community-based Conservation Centres

### Agasthyamalai, Manimuthar Listening to amphibians

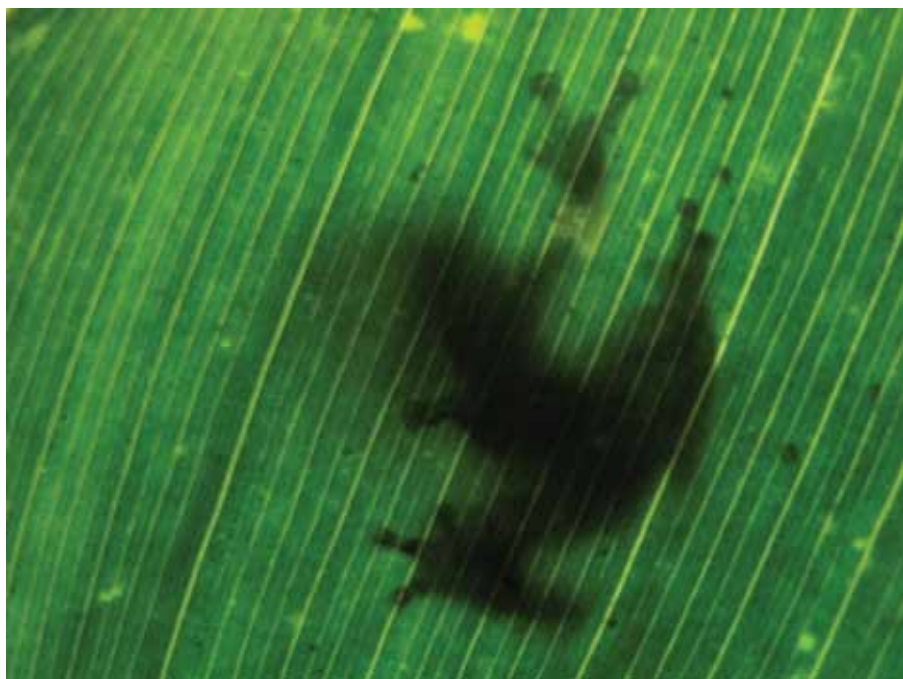
ATREE has initiated a first-time project to monitor the presence of frogs in the evergreen forests of Western Ghats. Amphibians are sensitive to temperature and moisture in the atmosphere, and so can serve as indicators of climate change. Researchers are recording mating calls of frogs by placing automated sound recorders and also climate data loggers in forests. The researchers plan to use this data to discern a pattern between climate and the frog species found in an area. This will also be the first effort to monitor amphibians for long-term population dynamics.

India is home to 277 anurans (tail-less amphibians such as frogs and toads), and nearly 150 are listed on the IUCN Red List of threatened species. Many of these have only recently been described to science and are already in danger of extinction. Going by the

predictions of the Intergovernmental Panel on Climate Change (IPCC), many more anurans might be pushed to the brink of extinction. The key components of this study include a pilot survey of anurans and documentation of calls of each species, intensive study of their habitat, a citizen science enterprise of community participation in the monitoring exercise, and the training of volunteers from rural and urban areas for this purpose.

The success of the pilot project helped the team bag the prestigious 'Future Conservationist' award by the Conservation Leadership Programme and Save Our Species campaign.

For more on the Agasthyamalai CCC work, see the research story on the role of owls in pest control of forest fringe agricultural landscapes (pg 21).



Seshadri KS



Seshadri KS

*The sound of fast flowing water is louder than the mating call of the Malabar torrent frog. So it climbs onto a rock and waves its hind legs to attract a mate.*



Seshadri KS

*Developing eggs of Nyctibatrachus sp.*

## MM Hills

### Wild edible plants and traditional knowledge

Soliga and Lingayat communities use wild edible plants as a part of their traditional food basket. Roots, tubers, fruits and leaves supplement their diet, and help them through the dry months of low agricultural production. This practice has evolved over generations as a survival strategy.

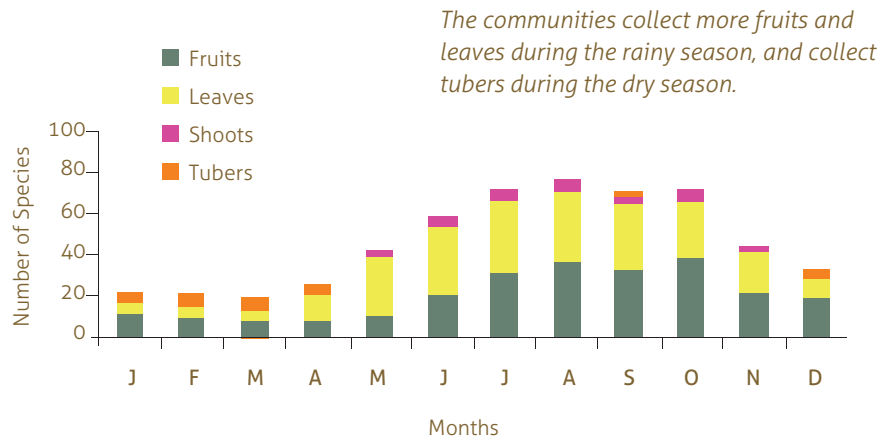
ATREE found this community knowledge of wild plants unique. The study showed that the Soligas and Lingayats could predict the availability of vegetables with respect to micro-climatic changes, and used wild plants according to their seasonal availability and phenological status. They also reported a decline in availability of wild edible plants. ATREE researchers are now documenting the plants and recipes in a trilingual guide (English, Kannada and Tamil) along with the traditional knowledge associated with their use.

Ramesh Kannan



ATREE identified 92 edible plant species, spread across 38 families and 68 genera. Most species belong to the Amaranthaceae, Solanaceae and Dioscoraceae families. Despite changing lifestyles, most households in MM Hills use wild edible plants throughout the year. These plants not only supplement the regular diet but are sometimes a major source of food. These findings will be useful for further investigation into nutritional profiles and conservational studies of the reported plant species. ATREE is promoting cultivation of some wild plants in homestead gardens as a strategy for their conservation.

Also see story on work with foresters on lantana spread in MM Hills (pg 28) and report on conservation education for teachers at MM Hills (pg 29).



Harisha RP



Harisha RP



## B R T Wildlife Sanctuary

### Forests rights and the Tiger Reserve notification

Soon after the notification of the rules for the Forest Right Act (FRA) in 2008, Soligas in BRT Wildlife Sanctuary began to actively constitute forest rights committees in the forest areas of Chamarajanagara district. A total of 105 committees were constituted in the district.

The first claims filed by the Soligas were community forest rights under section 3(1)c, specifically for Non Timber Forest Produce (NTPF) collection and trade within the BRT sanctuary.

Although across the country, the initial claims were for land rights, Soligas chose to first apply for NTPF collection rights as rights to NTPF collection were suspended after the amendment to the Wildlife Protection Act (WLP) which banned collection from national parks and sanctuaries. The impact of this ban on household income and well-being has been severe.

In 2009, Soliga households in BRT and surrounding areas applied for rights to individual land and by early 2011, 1438 Soliga households were granted individual rights to cultivated land, but not habitation. Nearly half the Soliga households are landless, so the grant of land does not in itself ensure better livelihood for them. Community forest rights are essential for their livelihood. In addition to claiming rights to NTFP, eight Gram Sabhas have applied for rights to fishing, grazing, conservation, and management. Although the Sub-divisional Level Committee approved the claim for NTFP rights, the District Level Committee has not granted NTFP rights even after three years of intense parleying by Soligas and officers of the tribal and district administration. The Forest Department representative on the committee has prevented the granting of community rights citing the WLP provisions that ban the collection of NTFP. This is a violation of the letter and spirit of the FRA. It reflects a country-wide pattern in the vesting of individual rights but a reluctance to grant community rights of any kind.

In September 2010, the Karnataka state government obtained in principle approval from the MoEF to declare BRT a tiger reserve and notified the reserve in January 2011. There were widespread protests from all quarters when this news was received. The Soligas wrote to ministers and bureaucrats at the state and central governments, including the MoEF and to the National Tiger Conservation Authority (NTCA), many of whose members were against the notification. The declaration was done in haste and without the final approval from the NTCA.

This development nullifies the gains under FRA and threatens Soligas with dislocation, curtailment and loss of livelihood.

Although the FRA is clear that all rights should be vested before any modification of rights can occur, the forest department continues to deny Soligas access rights to NTFPs and the forest. The declaration of core and critical tiger habitats within the sanctuary will lead to the eventual relocation of about 10 *podus* to establish 'inviolable areas' for tiger conservation. This will have an immense impact on the socio-cultural and economic conditions of the Soligas.

ATREE has actively collaborated with the Soliga Abhivrudhi Sangha, Vivekananda Girijana Kalyana Kendra and Kalpavriksh to propose a community-based conservation approach that includes:

- ▶ Using available modern and traditional knowledge to work out a strategy for conservation
- ▶ Conceiving of a conservation landscape where tigers and other wildlife are secure against threats such as poaching, inappropriate forestry practices and monocultures such as the existing coffee estate, mining, etc.
- ▶ Building on the strong rights and organisational base of Soligas
- ▶ Sustaining existing and creating additional livelihood options such as community-based eco-tourism, and conservation through Soliga youth trained in forestry
- ▶ Creating an institutional mechanism in which the Forest Department, Soligas, and civil society organisations can jointly plan, implement and monitor conservation strategies
- ▶ Instituting a strong ecological monitoring system that provides continuous feedback for adaptive management



Bankers out birding

## Kanakapura Climate partnership

HSBC employees are discovering how field biologists recognise signs of climate change through a programme that creates awareness about biodiversity, the need to conserve native species in their natural environment, and the threats posed by climate change on biodiversity and human well-being.

ATREE and volunteers have set up research plots in Bilikal Range Forest and Forest Trails – a privately owned estate adjacent to Bannerghatta National Park. The volunteers have learnt to identify and document trees, birds and butterflies, and monitor phenological changes such as flowering, fruiting, leafing patterns in the area and take part in a bird census. So far, 264 volunteers have participated in this programme.

This programme is being carried out under the HSBC climate partnership with Earthwatch Institute, India since 2009, and is organised and conducted by the ATREE Kanakapura team.

Also see the report on photo documentation of rural Kanakapura by children under the section – 'Life through our eyes' on page 30.

## Natham What drives livelihood strategies?

The farming community of Valayar of Karandaimalai Hills in the southeast

of Dindigul district, Tamil Nadu is choosing to move away from the mixed cropping methods they have traditionally followed. The mixed cropping choice ensured healthy agro-biodiversity with cultivation of sorghum, *Sorghum bicolor*, finger millet, Italian millet, minor millet and *kambu* minor millet. However, in the foothills of Karandai, there has been a switch from traditional crops to commercial crops such as gherkins, vegetables and flowers; whereas in the hill tops, farmers have started cultivating cashew. What is the reason behind this switch?

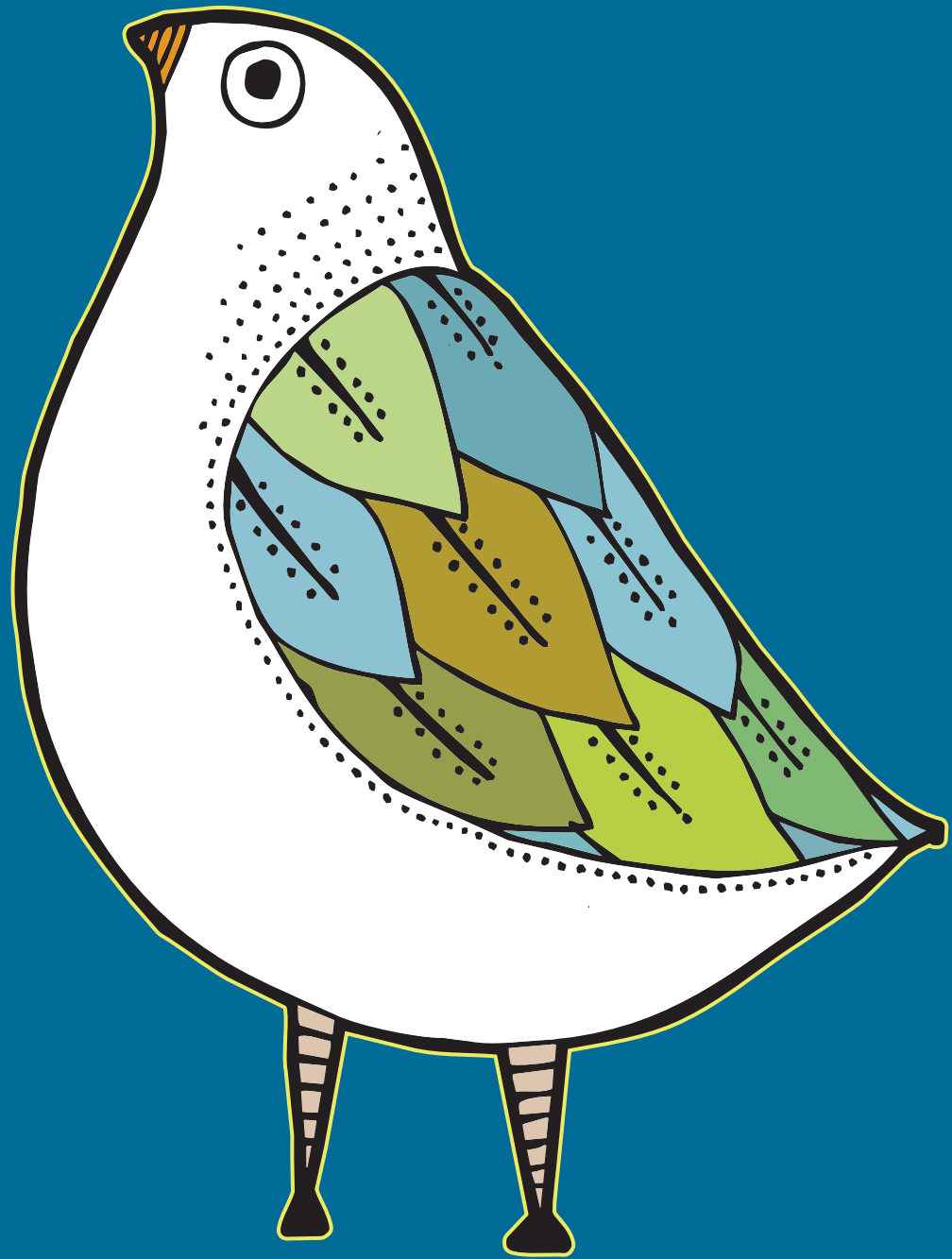
Identifying climate change, water access and market access as motivating forces, an ATREE study sought to understand how these factors influence decisions and responses regarding agriculture and livelihood. Two hill villages, two foothill villages and two canal belt villages were selected for the survey. People's recall of climate history and narration of current experiences with rainfall was compared with meteorological data. The most interesting inference is that agricultural and other economic decisions and actions cannot exclusively be labelled as climate change adaptation. Decisions and actions are also influenced by access to water, markets and technologies.

## Vembanad Facilitating wise use

The Vembanad Community Environmental Resource Centre (CERC) is promoting a participatory wetland conservation model that involves local stakeholder partnerships and indigenous knowledge. In 2008, CERC, Vembanad formed three Lake Protection Forums (LPF) in Muhamma panchayat with local fishermen. Today, this number has grown to 15 LPFs federated under the Samyuktha Kayal Samrekshana Samithy. These forums are involved in various

wetland conservation activities. One successful activity has been the setting up of fish and clam sanctuaries; its success has been endorsed by fisherfolk and validated by scientific evaluations by researchers from ATREE and the Aquaculture Department of St. Albert's College, Kochi. These fish sanctuaries or *matsyathavalam*, provide safe breeding waters for fish. There are eight fish and five clam sanctuaries and these are considered public property resources, even though they are protected by the respective LPFs. The indigenous method used in setting up *matsyathavalams* has been identified as an effective way to conserve fishery resources. The Government of Kerala has also endorsed this by funding a proposal to set up more sanctuaries under the Kuttanad Development Package. ATREE is also trying to encourage ethical fishing practices through awareness and capacity building sessions.

Various scholars and management agencies have researched the social and ecological aspects of the Vembanad wetland complex for decades but a lot of this information remains scattered and inaccessible. ATREE has collated a large amount of information, including maps, databases, scientific articles, reports and photographs from various sources and is in the process of setting up an open-access, web-based information system to enhance public access to this knowledge base. The 'Vembanad Knowledge Portal' will adhere to global standards of information exchange and is expected to go online by end of 2011.



# Outreach

ATREE's outreach work consists of grants-based activities that enable research and action at smaller and more local scales, need-based capacity building and action research in the Eastern Himalayas.

## Action Research in the Eastern Himalayas

ATREE has invested in long-term outreach in the Eastern Himalayas, with focus on poverty alleviation and sustainable landscape management. This outreach is aimed at improving livelihood security of marginal farmers and creating awareness of sustainable use of bio-resources. The projects are being implemented in Darjeeling and Sikkim under the Conservation and Livelihoods programme, through two projects: Technological Innovations and Ecological Research for the Sustainable Use of Bio-resources in Sikkim and Enhancing Conservation and Livelihood Security in Biodiversity Hotspots in Darjeeling.



*A Dokpa woman at Thangu, North Sikkim.*

### Sustainable use of bio-resources in Sikkim

With the end objective of improving livelihood and sustainable use practices, this project seeks to create awareness about available bio-resources in the state through promotion of more efficient bio-resource use devices, and through outreach activities.

ATREE is working with nomadic yak herder communities in the higher reaches of Lachen in North Sikkim. The researchers are monitoring the communities' resource consumption patterns and their impact on the local environment, and providing technological innovations for more efficient use of bio-resources.

## Enhancing conservation and livelihood security in biodiversity hotspots

ATREE worked with 14 communities in the vicinity of three protected areas – Singalila National Park, Neora Valley National Park and Senchal Wildlife Sanctuary to arrive at workable models of natural resource management. In the final year of the project, our assessment of the economic, social and ecological

impacts shows that the project has resulted in the formation of social networks and self-help groups (SHGs), and their move from a guided to an interdependent working model.

Socially, the communities are better linked, with stronger local institutions, and with better skills and understanding of local dynamics. It has become easier to mobilise communities through the 33 SHGs, two-thirds of which

are women's groups. These SHGs have been linked with the local Gramin Bank so that they can tap into government loan schemes. ATREE has also facilitated discussions on common-stakes issues such as transboundary conservation, biodiversity conservation and the FRA through workshops and seminars involving communities, NGOs and the Forest Department.

ATREE took part in a two-day workshop on the status and implementation of FRA in Darjeeling, organised by the National Forum of Forest People and Forest Workers, and undertook a preliminary assessment of the implementation of the FRA with respect to the hill district of Darjeeling.



Shristi Kamal

Farmers have benefited from low-cost greenhouses.





Shristi Kamal



Apiary training

Beekeeping provides extra income and pollination services

ATREE has provided livelihood options that have conservation value as well as economic benefits, creating a win-win situation for sustainable use and livelihoods. These options include apiaries, square-metre vegetable gardens (SMVGs), ginger cultivation, handicrafts, organic agricultural produce and eco-tourism. SMVGs account for an 18% per annum increase in income, compared to agriculture. Ginger cultivation moves annual incomes upward by as much as 66% as compared to other activities put together; apiary produce has also added to household incomes.

ATREE's fair trade outlet, Life and Leaf, through which produce from these activities as well as from other NGO networks is marketed, is now an independent-of-ATREE unit that supports eight local partners, nine local SHGs from Darjeeling and 10 groups from the north-east directly. Annual income of some of the SHGs from the outlet was as much as ₹ 60,000.

Honey production



Shristi Kamal





Shristi Kamal

*Biobriquettes as an alternative to fuelwood*

Project interactions on eco-tourism, use of charcoal briquettes and organic compost and environment-dependent livelihood activities such as apiary and SMVGs have helped build awareness about the importance of a healthy ecosystem and sustainable resource use. SMVGs and organic farms have promoted the revival of local seed banks, collecting up to 47 types of local crop varieties.

The communities ATREE is working with are also involved in monitoring the biodiversity of their forests, along with ATREE staff, to observe trends in resource consumption. ATREE is also doing a preliminary survey of people's perception of local biodiversity and impacts of climate change.

### Assam: support for young scholars

For the second year running in the World Heritage Biodiversity Programme for India project in Assam, ATREE disbursed scholarships for young scholars from schools in the fringe villages of Manas and Kaziranga National Parks. The students are selected on the basis of means and merit.

This is an outreach programme that targets teachers and parents as well as students, with the aim of raising awareness on the value of conserving the world heritage sites where they live.



Niraj Kakati

## Small Grants

### ATREE Small Grants for Research in NE India

A total of 14 researchers from north-east (NE) India have been supported through the ATREE Small Grants Programme for Research in NE India during 2010–2011. The objective of the grants programme is to support research and field work to fill critical information gaps in monographic and taxonomic work; build biodiversity databases for existing information in the public domain; support action research

for conservation of critically endangered, endangered and endemic species; and, provide incremental support to ongoing targeted high-impact projects having the potential for immediate conservation impact.

A sub-component supports doctoral studies in conservation biology with focus on the Eastern Himalayas region of India.

The ATREE Small Grants for Research in NE India has been made possible by support from the John D. and Catherine T. MacArthur Foundation's Programme on Global Security and Sustainability, the Ford Foundation and the National Geographic Society – Committee for Research and Exploration.

Sandesh Kadur



*Jerdon's Pit Viper (Protobothrops jerdonii) – one of eight snake species recorded by an expedition to Talle Valley Wildlife Sanctuary, Arunachal Pradesh*



The golden langur is one of India's endangered primates



Eastern Himalaya is a centre of diversity for the genus Primula



Many species of birds like this beautiful sibia rely on rhododendrons for nectar, often pollinating them in the process.

### Ford Small Grants Programme

The Ford Small Grants programme works towards building NGO capacities in conservation and livelihood needs in Arunachal Pradesh, Tripura, Nagaland, Assam and Mizoram—Eastern Himalayan region of India.

The focus of the previous year was on capacity/skill upgradation of SHGs, with emphasis on product design and development. Well-known and experienced resource persons in the relevant fields were identified and invited to train SHG members.

For instance, in Assam, Malamoni Hazarika, a national Award winner in Food Processing and Preservation (2009) was invited as the resource person to train communities in and around Manas National Park.

Now, a little over a year into the programme, ATREE has been able to support its partner NGOs to organise 86 SHGs and is already in the process of marketing 30 of their products at the Life and Leaf store. Through this programme, ATREE is directly supporting 1140 households. Local communities have been able to create market linkages with neighbouring villages and distant towns, thereby strengthening economic and social relations.

Overall, the building of community institutions in the form of SHGs; linking these through a marketing outlet, which itself is developing into an organisation; together with action at the grassroots level that is helping shape the processes for conservation of biodiversity, contribute to ATREE's goal of conservation. In the coming year, we focus on disseminating our lessons to a wider audience of policymakers, practitioners and academicians.

### CEPF Grants Programme in the Eastern Himalayas

The Critical Ecosystem Partnership Fund (CEPF) Grants Programme implemented by ATREE in the Eastern Himalayas ended in March 2011. Over a four-year period, from 2007–2011, the grants programme disbursed seven large grants and 40 small grants for conservation projects and studies in the Kanchenjunga–Singalila Landscape in Sikkim and West Bengal, and the North Bank Landscape covering parts of Assam and Arunachal Pradesh.

The grants enabled ATREE to work with a wide range of partners in the region, from independent researchers to community-based organisations, traditional institutions, NGOs, universities and research institutions.

Rohit Naniwadekar's study on the ecology of the Rufous-necked Hornbill and status of other hornbill species was supported by a CEPF small grant.



*Rufous-necked Hornbill is a globally threatened species. It is classified as Vulnerable by the IUCN.*



*Heads of Wreathed Hornbills, shot earlier that day in Lower Dibang Valley. Species such as Wreathed Hornbills are killed essentially for their meat. Hunting poses a severe threat to hornbills in Arunachal Pradesh.*



*Logging is another critical threat to hornbills in Arunachal Pradesh. Illegal logging is resulting in rapid decline in primary forests and, in cases, is followed by habitat conversion. The long-term impacts of logging and habitat loss on hornbills are unknown.*

Although much of the work focused on endangered and endemic species, and lesser known taxa, the grants also supported work on some threatened sites and conservation of cultural landscapes in Arunachal Pradesh. The doctoral support component of the grants supported six Ph D students.

The CEPF grants programme was part of a larger multi-country programme covering Nepal, Bhutan and India.

The grants were funded by CEPF, a joint initiative of Conservation International, International Bank for Reconstruction and Development, the Global Environment Facility, the Government of Japan, the John D. and Catherine T. MacArthur Foundation, and l'Agence Française de Développement.

For more on the grants programme, visit [www.cepf.net/](http://www.cepf.net/)

### CEPF regional strategy implementation: Western Ghats

CEPF conservation investment is guided by a region-specific investment strategy, developed with inputs and in consultation with diverse stakeholders. ATREE is the Regional Implementation Team (RIT) for such a CEPF conservation strategy in biodiversity important region of the Western Ghats. The strategy is guided by an ecosystem profile, developed for the Western Ghats by conservation and scientific institutions, with inputs from civil society. The objectives of these grants are to enable action by communities and partnerships to ensure conservation, enhance connectivity in corridors, and to improve conservation of globally threatened species of the Western Ghats through systematic conservation planning and action.

Some of the themes of the 28 current small grant projects, supported since 2009, include biodiversity value assessment using birds; community-based conservation and biodiversity monitoring; road-kill mitigation; development of conservation strategy for lion-tailed macaques; spatial data collection for conservation planning; taxonomic validity of an elusive small carnivore; identifying landscape level wildlife corridors; private and community forests in Sahyadri-Konkan; conservation of hill wetlands, protected area adequacy and conservation planning using tarantulas, conservation using audiovisual media, etc.

At the closing of this financial year, ATREE and CEPF had initiated processes for a series of workshops to evaluate the CEPF-ATREE Western Ghats Programme, the RIT and the large and small grants. The workshop will involve presentations by grantees and group discussions to review the progress of the programme and the grants, and also to plan for the future.

See more on [http://atree.org/cepf\\_wghats](http://atree.org/cepf_wghats)

## Policy

ATREE uses researched knowledge to play a role in promoting socially just environmental policies. We draw upon engagement with wider audiences to inform public policy at various scales through three related engagement routes.

- Outreach to influence policies through locating research in strategic partnerships and engaging with various audiences
- Identifying best practices through established long-term engagements at community-based conservation centres
- Learning and skills building with stakeholders to arrive at better understanding of implications of policies and so respond to policy drafts

### Draft regulatory framework for wetlands conservation

ATREE advocates a decentralised role in conservation and natural resource management, and found itself reiterating this position when the MoEF circulated

India's first draft Wetlands Conservation and Management Rules 2009. The Vembanad Community Environmental Resource Centre team pointed out that the MoEF draft provides for official control through central, state and district level authorities, but excludes local stakeholders from the decision-making processes. ATREE's wetland conservation team consulted with Vembanad stakeholders to arrive at pertinent concerns, which were submitted to the Ministry. The significant observation was that the new framework continued to propose unjustifiable state control and interventions over the country's wetlands and livelihood, without allowing for any say by the people dependent on them.

### Future of forest governance post RFRA?

ATREE faculty, Sharachandra Lele, was invited to be member of the National Forest Rights Act Committee (FRAC) set up jointly by the MoEF and Ministry of Tribal Affairs. The purpose of this committee was to evaluate the implementation of the FRA across the country and to recommend changes in forest governance and policy. One of the most difficult and contentious tasks within this requirement was to redefine the traditional role of the Forest Department in light of the RFRA.

To provide a background: in the administrative mechanisms set up by the British, and continuing post-independence, the Forest Department was the sole administrative and decision-making unit of forest governance. The RFRA, however, requires this authority to devolve some of its administrative and decision-making powers on forest and natural resource governance to forest-dwelling communities, through Gram Sabhas. This requirement has been met with resistance.

The FRAC report was submitted after eight months of field work across 17 states, meetings with officials at all levels, public hearings, meetings with activists/NGOs, and inputs from the public.

The minutes, state visit reports and recommendations of the committee are available in public domain at <https://sites.google.com/site/fraccommittee/home>.

### Global resources, national boundaries

The more contentious aspects of the Convention on Biological Diversity (CBD) relate to access to genetic resources and benefit sharing from the use of biodiversity. In critiques published last year, researchers from Kerala Agricultural University and ATREE have questioned the sovereignty principle of the CBD that underlies state control over genetic resources and the national legislations that have emerged over the years. The 'parochial restrictive measures', they argue, ignore the world's interdependence on genetic resources, the evolutionary history of crop plants and the complex plant genetic interdependence relationships that nations are in today.

The policy review looks at the history of benefit sharing since the CBD and critically examines some of the cases that have been put forward as successful examples of benefit sharing. They suggest that these at best illustrate the limitations of commercialisation of traditional knowledge and that communities over the world have benefited more from the historical treatment of biological resources as a common heritage. Given this history, and given that these measures also hinder research, they argue that the developing world, in its own interest, should forego benefit sharing to facilitate free exchange of genetic resources.



ATREE

## TN KHOSHOO ECOLOGY + ENVIRONMENT AWARD FOR SCHOOLS

*Khoshoo School Award winners, Bengaluru*

### Thinking and doing: Action by youth

The Khoshoo Endowment Fund and ATREE invested in extending the scope and meaning of the awards this year, by flagging off the first TN Khoshoo Ecology and Environment Award for Schools in 2010. The school awards will recognise creative, impactful action by students to advance environmental sustainability in their immediate surroundings. The awards were launched for schools in Delhi and Bengaluru. ATREE has forged key partnerships with Pravah, The Teacher Foundation, Wipro and IAIM-FRLHT to develop the school awards in meaningful ways.

The Khoshoo Endowment Fund recognises outstanding contributions in the fields of ecology and environment in India. It has been set up by the Khoshoo family, along with partners who share its values of socially just conservation and environmentally sustainable development – ATREE, and Institute of Rural Research and Development (a Sehgal Foundation Initiative).

## TN Khoshoo Memorial Awards

The TN Khoshoo Memorial Awards honour the memory of Dr Triloki Nath Khoshoo, draughtsman of India's first environmental policy, and scientist and environmentalist of international repute. Every year, since 2004, the awards have been given to practitioners and academics for excellence in the science and action relating to conservation, environment and development.

The recipients of the TN Khoshoo Memorial Awards for 2010 were Joss Brooks and Girish Sant. Joss Brooks is the founder of the Pitchandikulam Bioresource Centre in Puducherry. He has worked extensively on restoration projects that have turned typical urban wasteland environments of debris, garbage and sewage into model landscapes of species regeneration, practical environmental education and

citizen/government collaboration. Girish Sant, co-founder of the Pune-based Prayas, received the award as part of the Prayas (Energy Group) for its policy-influencing work in the energy sector. Prayas Energy Group does analysis-based advocacy to further public interest in the electricity sector, and has played a significant role in shaping transparency and accountability of electricity regulatory commissions.

Dr RK Pachauri, Chair of the Nobel peace prize-winning Intergovernmental Panel on Climate Change, and Director General of The Energy and Resources Institute, delivered the 2010 TN Khoshoo Memorial Lecture at New Delhi. He spoke about the 'The Scientific and Ethical Dimensions of Climate Change'.



# Publications

## Articles

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**Gurudatt, P. S., V. Priti, S. Shweta, B. T. Ramesha, G. Ravikanth, R. Vasudeva, T. Amna, S. et al.**

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2010. Spatial interpolation of carbon stock: a case study from the Western Ghats biodiversity hotspot, India. *International Journal of Sustainable Development & World Ecology* 17(6): 1745–2627.

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2010. Beyond exclusion: Alternative approaches to biodiversity conservation in the developing tropics. *Current Opinions in Environmental Sustainability* 2(1–2): 94–100.

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**Purushotham, C. B., K. Dharmadhikari and R. Vivek.**  
2011. A comparison of hill stream anuran diversity across two habitats in Kalakad–Mundanthurai Tiger Reserve: A pilot study. *Froglg* 15:2–9.

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**Swamy, S. and S. Devy.**  
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**Vivek, R. and T. Ganesh.**  
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## Book chapters

**Elmqvist, T., M. Tuwendal, J. Krishnaswamy and K. Hylander.**  
2010. Ecosystem services: managing trade-offs between provisioning and regulating services. In: *Valuation of regulating services of ecosystems: Methodology and applications* (eds. Kumar P. and M. Wood) Pp. 24–39. London: Routledge.

**Lele, S., M. Pattanaik and N. D. Rai.**  
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**Ravikanth G., R. Vasudeva, K.N. Ganeshaiah and R. Uma Shaanker.**  
2010. Garcinia Forest Gene Banks: An alternative approach for the conservation of Garcinia Genetic Resources of the Western Ghats. In: *Proceedings of the National Symposium on Garcinia Genetic Resources: Linking Diversity, Livelihood and Management* (eds. Vasudeva, R., B.S. Janagoudar, B.M.C. Reddy, B. Sthapit and H.P. Singh). Pp. 80–86. College of Forestry, Sirsi, India.

**Uma Shaanker, R., N. A. Aravind, Gladwin Joseph, R. Kannan and K.N. Ganeshaiah.**  
2010. Invasive plants in tropical human-dominated landscapes: Need for an inclusive management strategy. In: *Bioinvasions and globalization: Ecology, economics, management, and policy*. Pp. 202–219. Oxford: Oxford University Press.

## Books

**Bawa, K. S., R. B. Primack and M. A. Oommen.**  
2011. *Conservation biology: A primer for South Asia*. Universities Press (India) Pvt Ltd.

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2010. *Community-based natural resource management. Issues and cases from South Asia*. Sage Publications.

## Popular press

**Abhisheka, K., N.A. Aravind and T. Ganesh.**  
Attention, young eco champs! *Deccan Herald*, July 2010.

**Atkore, V.**  
Freshwater jewels. *Sanctuary Asia*, August 2010.

**Bawa, K. S.**  
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Make tourism sustainable in Vembanad backwaters. *Events Standard*, April–May 2010.

**Dharma Rajan, P. and K.D. Prathapan.**  
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**Kelkar, N. and K. Jagdish.**  
Keeping rivers alive. *Seminar*, September 2010.

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**Nagendra, H.**  
Biodiversity must be priority of this decade. *DNA Civic*, June 2010.

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Maps, lakes and citizens. *Seminar*, September 2010.

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### Nagendra, H.

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### Nagendra, H.

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### Nagendra, H.

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### Nagendra, H.

We need city-level green plans. *DNA*, January 2011.

### Ostrom, E. and H. Nagendra.

Be diverse, our planet. *Magazine of the United Nations Environment Programme*, May 2010.

### Rai, N. and A. Kothari.

Biligiri Tiger Reserve: Include Soligas in conservation plan. *Deccan Herald*, February 2011.

**Harini Nagendra** served as a member of the committee appointed by the MoEF, Government of India to recommend how Botanical Survey of India and Zoological Survey of India should be organised.

**Jagdish Krishnaswamy** has been invited to serve on the National Tri-State Chambal Sanctuary Management and Coordination Committee set up by the MoEF.

**Sharachchandra Lele**, appointed Member, MoEF-MoTA Joint Committee on Implementation of Forest Rights Act; He has received four fellowships: Yusuf Hamied Visiting Lectureship by the Cambridge-India Partnership; Charles Wallace Trust for India Visiting Fellowship, Centre for South Asian Studies, Cambridge University; Visiting Fellowship, Fitzwilliam College, University of Cambridge; and Visiting Fellowship under the Fulbright-Nehru Environmental Leadership Programme at the Woods Institute, Stanford University

**Gladwin Joseph** is serving as Chairman of the expert committee on Biodiversity Heritage Sites with the Karnataka Biodiversity Board since 2010.

**Latha Bhaskar** was nominated to the working group for the formulation of state-level strategy for climate change, Kerala.

**Shivanna K.R.**, Honorary Senior Fellow was appointed Chairman of the Scientific Advisory Committee for the DBT Institute of Bioresources and Sustainable Development, Imphal, Manipur for three years.

## Honours for members of the Governing Board

**Dr. Nandini Sundar** was awarded the 2010 Infosys Prize in Social Sciences.

**Darshan Shankar** was awarded the Padma Shri in the field of Public Affairs by the Government of India.

## Honours and Recognitions

### BR Hills environmental handbook

in Kannada, *Vana Sanjeevana*, brought out by Kalpavriksh, ATREE and Vivekananda Girijana Kalyana Kendra has received an award for the best Kannada book of the year from Akalanka Prathishtana, Udipi.

# People

## Governing Board

### Dr Kamaljit S. Bawa

Founder Trustee and President, ATREE  
Distinguished Professor of Biology,  
University of Massachusetts, Boston, USA

### Dr K. N. Ganeshaiah

Founder Trustee  
Professor and Head, Department of  
Forestry and Environmental Science  
and School of Ecology and Conservation,  
University of Agricultural Sciences,  
Bengaluru

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Founder Trustee  
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Physiology and School of Ecology and  
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Advisor, Foundation for Revitalisation  
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Consortium Director, CGIAR  
Former Representative, Ford Foundation,  
New Delhi

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(Retired) Professor of Civil Engineering,  
Indian Institute of Science, Bengaluru

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Professor of Economics, North Bengal  
University, Darjeeling

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Professor of Sociology, Delhi School  
of Economics, New Delhi

### Pheroza J. Godrej

Founder, Cymroza Art Gallery, Mumbai.  
President, National Society of the  
Friends of Trees

### Rohini Nilekani

Trustee, ATREE  
Chairperson, Arghyam Foundation  
Chairperson, Pratham Books, Bengaluru

### Dr S. N. Rai

Former Principal Chief Conservator of  
Forests, Karnataka Forest Department,  
Bengaluru

### Seema Paul

Programme Director, India Energy  
Initiative, The Climate Works Foundation,  
San Francisco, USA

### Dr Surinder M. Sehgal

Trustee, ATREE  
Chairman, Sehgal Family Foundation,  
Iowa, USA  
Chairman of Board of Trustees, Institute  
of Rural Research and Development,  
Gurgaon, India  
Honorary Trustee, Missouri Botanical  
Garden, USA

### Dr Gladwin Joseph (*ex-officio*)

Director, ATREE, Bengaluru

## Advisory Board

### Dr Dan Martin

Committee for Research and Exploration  
Experts, National Geographic Society,  
USA  
Advisory Council of the Princeton  
Environmental Institute, USA

### Dr Jagmohan Maini

Former Coordinator and Head, UNFF  
Secretariat, New York  
Former Chairman, Board of Trustees,  
Centre for International Forestry  
Research, Bogor, Indonesia

### Dr Peter Raven

Chair of the National Geographic  
Society's Committee for Research and  
Exploration  
President Emeritus, Missouri Botanical  
Garden, USA

### Dr R. A. Mashelkar

Padma Bhushan, Padma Shri  
CSIR Bhatnagar Fellow, National  
Chemical Laboratory, Pune  
Chairperson, National Innovation  
Foundation, Ahmedabad  
Fellow, Royal Society, London  
Former Director General, Council  
of Scientific and Industrial Research,  
New Delhi

## Executive Committee

### Dr Ankila Hiremath

### Dr Gladwin Joseph (Chair)

### Dr M. Soubadra Devy

### Dr Nitin Rai

### Dr Priyadarsanan Dharma Rajan

### Dr R. Ganesan

### Dr Robert John Chandran

### Suman Rai

# New Faculty



Ashokankur Datta

My research interests can be broadly classified into two groups.

1. Empirical analysis of the distributional effects of environmental policy
2. Economic modelling to have a better understanding of the functioning of environmental policy instruments

During my doctoral research, I have worked on issues of fuel taxation and climate policy. I have a strong research interest in issues that lie in the intersection set of economics of discrimination and environmental economics. I am currently working on a comparative study of the Van Panchayat and non-Van Panchayat forests in Uttarakhand, with special emphasis on the distributional issues. At ATREE, I am working with the Forest and Governance team on the political ecology of forest ecosystem services and poverty alleviation in Orissa.



Swati Shresth

My core interest is in environmental history. My academic interests however, have evolved as part of a prolonged involvement with environmental issues. I encourage my students to appreciate 'history' as an ongoing process, one in which their lives are implicated. As a historian and as an environmental activist, I am also convinced that teaching must facilitate self-reflection and a deeper understanding of the world we live in, the people we interact with and the choices we make. I would like my students not only to research and think critically about notions of 'progress' and 'growth' that have of late dominated discussions on development in India; but also to think critically about the formal and informal sources of political and economic power, and about concepts such as cultural hegemony, traditional knowledge and customary rights.

Given my interests in contemporary environment issues, I am also engaged in debates in three focus areas – land and water resources, forests and livelihoods, energy and climate change. I am currently involved in research on community-led conservation, forest governance and market-based strategies as solution to climate change.

Since September 2010, I have had the opportunity to steer ATREE's research beyond publications. I look forward to forging new institutional relationships with students, communities and other organisations that share ATREE's mission on rights-based conservation.

# Staff and Students

## Faculty

### Dr Ankila Hiremath

Fellow

Co-programme leader – Ecosystems and Global Change

### Dr Ashokankur Datta

Fellow

### Dr Bejoy K. Thomas

Fellow

### Dr G. Ravikanth

Fellow

### Dr Jagdish Krishnaswamy

Senior Fellow

Convenor – Suri Sehgal Centre for Biodiversity and Conservation, Programme Leader – Ecosystem Services and Human Well-being

### Dr M. Soubadra Devy

Fellow

### Dr Mohan Seetharam

Fellow, *till December 2010*

### Dr N. A. Aravind

Fellow

Coordinator – Academy for Conservation Science and Sustainability Studies

### Dr Nitin Rai

Fellow

### Dr Priyadarsanan Dharma Rajan

Senior Fellow

Co-Programme Leader – Ecosystems and Global Change

### Dr R. Ganesan

Fellow

### Dr Robert John Chandran

Fellow, *till October 2010*

### Dr Seema Purushothaman

Fellow

### Dr Sharachchandra Lele

Senior Fellow

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- ▶ Manas Ever Welfare Society, Baksa, Assam
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- ▶ University of Liverpool, Liverpool, UK
- ▶ Wipro Limited, Bengaluru, India
- ▶ World Bank, Washington DC, USA
- ▶ World Wildlife Fund, Kathmandu, Nepal

### Endowments

- ▶ Arghyam Foundation, Bengaluru, India
- ▶ Bawa Family, Belmont, USA
- ▶ Ford Foundation, New Delhi, India
- ▶ Kasturi Trust, Bengaluru, India
- ▶ Mohini Khoshoo, New Delhi, India
- ▶ Rohini Nilekani, Bengaluru, India
- ▶ Sehgal Family Foundation, Iowa, USA
- ▶ Sir Dorabji Tata Trust, Mumbai, India
- ▶ TVS Motor Company, Chennai, India

## AUDIT REPORT

We have audited the attached Balance Sheet of ASHOKA TRUST FOR RESEARCH IN ECOLOGY AND THE ENVIRONMENT (ATREE) as at 31 March 2011 and Income and Expenditure Account for the year ended on that date hereto. These financial statements are the responsibility of the management of the trust. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in India. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the management as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

Further, we report that:

- (i) We have obtained all information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit;
- (ii) In our opinion, proper books of account have been maintained by the trust, so far as appears from our examination of those books;
- (iii) The Balance Sheet and the Income and Expenditure Account dealt with by this report are in agreement with the books of account;
- (iv) The Balance Sheet and Income and Expenditure Account dealt with by this report comply with the accounting standards applicable to the trust;
- (v) In our opinion and to the best of our information and according to the explanations given to us, the said accounts give a true and fair view in conformity with the accounting principles generally accepted in India;
  - (a) in the case of Balance Sheet, of the state of affairs of the trust as at 31 March 2011.
  - (b) in the case of the Income and Expenditure Account, of the excess of Expenditure over Income for the year ended on 31 March 2011.

Place: Bengaluru  
Date: 4th July 2011

for G. ANANTHA & Co.  
Chartered Accountants  
FRN 005160S

Rani. N.R  
Partner  
M. NO. 214318

## Balance Sheet as at March 31, 2011

Rupees in Lakhs

	As at March 31, 2011		As at March 31, 2010	
<b>Sources of Funds</b>				
Corpus Fund		2,509.49		1,851.27
Building Fund		395.44		395.44
General Fund		181.13		188.51
Utilised Reserves (Project Assets)		546.10		433.73
Project Fund		825.61		890.65
<b>Total</b>		<b>4,457.77</b>		<b>3,759.60</b>
<b>Application of Funds</b>				
<b>Fixed Assets</b>				
Project Assets		546.10		433.73
ATREE Assets		36.09		30.52
Building		433.07		433.26
<b>Investments</b>				
Corpus Fund Investments		2,535.29		1,739.47
Other Investments		656.15		545.02
<b>Current Assets and Liabilities</b>				
Advances	26.38		32.81	
Other Current Assets	40.29		37.88	
Cash and Bank	187.47		512.05	
<b>Gross current assets</b>	<b>254.14</b>		<b>582.74</b>	
Less: Current Liabilities	3.07		5.13	
Net Current Assets		251.07		577.60
<b>Total</b>		<b>4,457.77</b>		<b>3,759.60</b>



## Income and Expenditure Account for the year ended March 31, 2011

Rupees in Lakhs

Particulars	March 31, 2011		March 31, 2010	
<b>Income</b>				
Project Income		990.32		822.50
Donation and Other Income		0.21		25.16
Interest		24.33		28.98
<b>Total</b>		<b>1,014.86</b>		<b>876.64</b>
<b>Expenditure</b>				
Salaries and Staff Cost		472.63		441.71
Travel		66.72		104.42
Project and Operating Expenses				
<i>Project Expenses</i>	443.28		300.27	
<i>Operating Expenses</i>	28.62		24.46	
<b>Total Project and Operating Expenses</b>		<b>471.90</b>		<b>324.73</b>
Depreciation		10.99		56.51
<b>Total</b>		<b>1,022.24</b>		<b>927.37</b>
<b>Surplus/(Deficit)</b>		<b>(7.38)</b>		<b>(50.73)</b>

### Management Note:

During the year, it was decided to charge depreciation on assets under straight line method with rates of depreciation based on the estimated useful life of the assets.

During previous two years, depreciation was charged as per rates under the Income Tax Act. Depreciation is provided only on ATREE assets including buildings, and not on project assets.



ATREE is recognised as a Scientific and Industrial Research Organisation by the Ministry of Science and Technology, Government of India.

ATREE is registered with the Sub-Registrar, Bengaluru North Taluk as a Public Charitable Trust and with the Ministry of Home Affairs, Government of India under Section 6(1) of the Foreign Contribution (Regulation) Act, 1976.

ATREE is registered as a wholly Charitable Trust under Section 12(A)(a) of the Indian Income Tax Act, 1961 and donations to it are eligible for 175% / 100% tax exemption under Section 35(1)(ii) / Section 80GGA(2)(a) of the Indian Income Tax Act, 1961.

## ATREE Offices

### Bengaluru (Main)

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### Eastern Himalayas (Regional)

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Tel: +91 354 2259297

### New Delhi (Policy liaison and development)

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New Delhi 110014  
Telefax: +9111 24323133

## ATREE Community-based Conservation Centres (Field Academies)

### Biligiri Community-based Conservation Centre

BR Hills, Chamrajanagara District  
Karnataka 571441  
Ph: +91 958 226244076

### MM Hills Community-based Conservation Centre

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Chamrajanagara District  
Karnataka 571490  
Ph: +91 80 23635555 ext. 106

### Natham Community-based Conservation Centre

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Ph: +91 944 3314306

### Agasthyamalai Community-based Conservation Centre

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### Kanakapura Community-based Conservation Centre

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Ramanagara District, Karnataka 562121,  
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### Vembanad Community Environmental Resource Centre

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## Field Offices

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### Sikkim

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Visit [www.atree.org](http://www.atree.org)  
to know more about us.

“To promote socially just environmental conservation and sustainable development by generating rigorous interdisciplinary knowledge that engages actively with academia, policy makers, practitioners, activists, students and wider public audiences.”

## mission statement

