

# ANNUAL REPORT 2014-15



## Governing Board

**\*\*DR. K. S. BAWA**

Distinguished Professor of Biology,  
University of Massachusetts, Boston, MA, USA  
(Chairman, Governing Board).

**\*\*DR. K. N. GANESHAIAH**, Professor

University of Agricultural Sciences, Bangalore, India.

**\*\*DR. R. UMA SHAANKER**, Professor

University of Agricultural Sciences, Bangalore, India.

**\*\*MR. DARSHAN SHANKAR**, Chairman

Institute of Ayurveda and Integrative Medicine,  
Bangalore, Advisor, Foundation for Revitalisation  
of Local Health Traditions, Bangalore, and Managing  
Trustee, Foundation for Revitalization  
of Local Health Traditions, Bangalore, India.

**\*\*DR. SURINDER M. SEHGAL**, President,

Sehgal Family Foundation, Iowa, USA, and  
Chairman of Board of Trustees, Institute of  
Rural Research and Development, Gurgaon, India.

**\*\*MS. ROHINI NILEKANI**, Chairperson

Arghyam Foundation, Chairperson,  
Pratham Books, Bangalore, India.

**MS. SEEMA PAUL**, Consultant, USA.

**DR. PHEROZA J. GODREJ**, Founder

Cymroza Art Gallery, Mumbai, India.

**REPRESENTATIVE** of Sir Dorabji Tata Trust, Mumbai, India.

**PROF. K.S. JAGADISH**, Retired Professor

Civil Engineering, Indian Institute of Science  
Bangalore, India.

**DR. S. NATESH**, Former Senior Scientist

Department of Biotechnology,  
Government of India, New Delhi, India.

**DR. GANESAN BALACHANDER**, Director (Ex officio),

Ashoka Trust for Research in Ecology and  
the Environment, Bangalore, India.

**DR. BEJOY K. THOMAS** (Faculty Representative), Fellow

Ashoka Trust for Research in Ecology  
and the Environment, Bangalore, India.

## Advisory Board

**\*DR. VIJAY RAGHAVAN**, Secretary

Department of Biotechnology, Government of India,  
and Former Director, National Centre for Biological  
Sciences, Bangalore, India.

**DR. RAGHAVENDRA GADAGKAR**, INSA S.N. Bose Research

Professor and J.C. Bose National Fellow,  
Centre for Ecological Sciences, Bangalore, India.

**\*DR. AMITA BAVISKAR**, Associate Professor

Institute of Economic Growth, Delhi, India.

**\*DR. NAVROZ K. DUBASH**, Senior Fellow

Centre for Policy Research, New Delhi, India.

**\*DR. GITA SEN**, Centre for Public Policy,

Indian Institute of Management, Bangalore, India.

**MR. RAJ KHOSHOO**, Senior Vice President

Siemens PLM, CA, USA.

**MS. KALPANA SHARMA**, Independent Journalist/  
Columnist, Mumbai, India.

**DR. RAVI CHOPRA**, Director

Peoples' Science Institute, Dehradun, Uttarakhand, India.

**\*DR. S. P. SINGH**, Former Vice Chancellor, HNB Garhwal

University and former Advisor, State Planning  
Commission, Government of Uttarakhand, Dehradun,  
Uttarakhand, India.

*\*\* Also serves as a Trustee*

*\* Serves also on the Faculty Advisory Committee*

## CONTENTS

President's Message	04
From the Director's Desk	05
Important Events and Recognitions	06
Research Highlights	07
Academy for Conservation Science and Sustainability Studies	19
Publications	23
Outreach and Capacity Building	27
People	30
Funding Partners	32
Financial Statement	33



## PRESIDENT'S MESSAGE

### CLIMATE CHANGE IMPERATIVES

This year marks the beginning of ATREE's second five-year strategic plan. We have reconfigured our programmes in biodiversity and ecosystem services, forests and governance, and water, and also launched a new one on climate change.

The initiation of the programme on climate change is timely. With the Conference of Parties to the 1992 United Nations Framework Convention on Climate's Change entering into a global agreement on the reduction in carbon emissions, pressures have grown on countries to limit emissions. Even without international pressures, it is in our self-interest to think about the huge challenges of a low carbon future.

Climate change has already started to affect our lives, and its effects on agriculture, biodiversity, and water — all the areas in which ATREE has a vital interest — will increase. Thus ATREE's work on climate change is not confined to the programme bearing this name: it permeates throughout the organisation. And for the same reason, although the initial focus of the climate change programme might be mitigation, the work on adaptation and climate change impacts will continue throughout the organization.

As will be evident from the pages of this report, ATREE continues to make a headway in the study of other drivers responsible for changes

in interactions between nature and society -- interactions that will themselves be affected by climate change. Sentinel Landscapes Project represents a unique effort to measure long-term change in the Western Ghats landscapes. Several projects in the Western Ghats and the Eastern Himalaya are assessing such changes and their impacts on rural livelihoods at smaller spatial scales. Another initiative is assessing changes in urbanising watersheds with concomitant effects on water quantity and quality.

Young people throughout our country are the engines of innovation, and ATREE is no exception. Pages on the Academy in this report highlight contributions and achievements of our doctoral students. In the years to come, we hope to further enrich and nurture our programmes designed to build a new generation of environmental leaders.

Once again, we thank our supporters and donors for our successes. In particular, we are grateful to Rohini Nilekani, the Sehgal Family Foundation, the Shibulal Family, the Tata Trusts, and the Royal Norwegian embassy for their generous support and encouragement.

As always, we seek suggestions from the readers, friends and supporters, to increase the effectiveness of our work.

**Kamaljit S. Bawa**  
President, ATREE

## DIRECTOR'S DESK

We live in challenging times. On the one hand, there is support for undertaking research that is interdisciplinary and collaborative, with multiple partners bringing their different core competencies to address increasingly complex issues, some of which may be termed 'wicked problems.' Climate change is seen as one, not because of a preordained 'evil' nature that it may be associated with, but because of the complexity in understanding the drivers and ways to resolve them. Environmental degradation is another.

On the other hand, there is enormous pressure on the government to meet the growing aspirations of the people for development, and for the most basic needs for dignified living, including jobs, shelter and access to clean water. ATREE scientists are working on these kinds of research questions to gather the evidence and knowledge, often years in the making, for society and policy makers to make informed decisions in a quest for balanced development. That was also the theme of this year's TN Khoshoo event that ATREE hosts annually.

ATREE is making steady progress as a well-established scientific organization, recognized by the government and by its ranking among the leading environmental think tanks of the world. We are grateful to our donors, both national and international for making this possible.

We commissioned an external evaluation of ATREE, five years since the last one, to see how and in what specific aspects of its programmes and internal governance could it make further improvements. The report on the whole was laudatory and made some useful recommendations, which are being acted upon.

All of us at ATREE are fully committed and dedicated to promoting the mission of achieving socially just environmental conservation and sustainable development.

**Dr. Ganesan Balachander**  
Director, ATREE

## IMPORTANT RECOGNITIONS 2014-15

ATREE was ranked 18th in the list of top environmental think tanks of the world.

As per the 2014 Global Go To Think Tank Index Report, released by The Think Tanks and Civil Societies Program (TTCSP) of the University of Pennsylvania, PA, USA. ATREE has been consistently among the top in Asia for the past four years.

...

ATREE President, Professor Kamal Bawa, received the Midori Prize for Biodiversity for his years of work on conservation in the Himalayas at the COP-12 in Pyeongchang, South Korea.

...

Sharachandra Lele, Senior Fellow, ATREE, was elected President of the Indian Society for Ecological Economics (INSEE) for the years 2014-16. Sharad, a founder-member of INSEE, served on its Executive Committee for six years in various capacities. He was also on the Syllabus Drafting Committee for Environmental Studies, Nalanda University.

...

Jagdish Krishnaswamy, Senior Fellow, ATREE and Seema Purushothaman, Adjunct Faculty, were elected Executive Committee Members, INSEE.

...

Nitin Rai, Fellow and Convenor, Academy for Conservation Science and Sustainability Studies, was invited to serve on International Union of Forest Research Organizations – IUFRO's Global Forest Expert Panel on Forests and Food Security.

...

Aravind Madhyastha, Fellow, ATREE, was elected as a member of the IUCN SSC Mollusc Specialist Group and the IUCN SSC Amphibian Specialist Group.



Dr Kamal Bawa, receiving the Midori Prize for Biodiversity at COP-12 in Pyeongchang, South Korea.

## RESEARCH HIGHLIGHTS

ATREE'S RESEARCH IS ORGANIZED UNDER FOUR CATEGORIES



### Suri Sehgal Centre for Biodiversity and Conservation

1. Ecosystem Services and Human Wellbeing (ESHW)
2. Ecosystems and Global Change (E&GC)



### Centre for Environment and Development

3. Land, Water and Livelihoods (LWL)
4. Forests and Governance (F&G)





SURI SEHGAL CENTRE FOR BIODIVERSITY AND CONSERVATION

## Ecosystems and Global Change

The goal of this programme is to understand the complex dynamics of social-ecological systems and to generate knowledge to better deal with the uncertainty of ecosystems under global change.



### LONG TERM MONITORING: PHENOLOGY AND CLIMATE CHANGE

Global efforts have been on for decades to monitor ecosystems at various scales, including several initiatives of the Conservation International, specifically, the Tropical Ecology, Assessment and Monitoring (TEAM) initiative, which has established Long Term Ecological Research plots across the world. The 50 ha initiatives by the Centre for Tropical Forest Science (Smithsonian Institution) is another example of an ecosystem monitoring project. However, in India, monitoring natural ecosystems has neither been comprehensive nor done over a long

period of time; there is only one 50 hectare plot in the forest, none of the monitoring programmes look at biodiversity, tropical mountain landscapes have also not been monitored and, adding to the lacunae in the study of ecosystems in the country, long term monitoring of phenology has not been done. Even globally, phenology is monitored in the long term in a few selected tropical sites. It's well known that phenological events over time reflect environmental variability and change, and can have a number of applications in conservation (e.g., species interactions), ecosystem dynamics (e.g., water and

carbon exchange), agriculture (e.g., timing of production), invasive species dynamics, etc.

Such changes and environmental variability can best be understood only through systematic long term data. The data collected at ATREE on phenology of trees over the last two decades can help answer and understand some of the processes mentioned above, especially how phenological patterns of rainforest trees in the Western Ghats respond to climate change and other anthropogenic disturbances.

The work is in progress and data is being collated and cured. We expect some broad outputs by end of this year, but more over the next 2–3 years.

### MEDICINAL PLANT TRADE AND SPECIES ADMIXTURES

India, a mega biodiversity country, is known for its rich diversity of medicinal plants and a long history of traditional medicinal practices. The Codified Indian System of Medicine recognizes the use of 2,400 medicinal plants, though about 6,000 higher plant species are

used in several folk healthcare traditions across the country. An estimated 9,500 registered herbal industries along with a multitude of unregistered cottage-level industries depend on the continuous supply of medicinal plants for manufacturing herbal products.

However, since barely 10% of this demand is met from cultivated sources, the predominant supply of these plants comes from the harvest of natural populations. Moreover, there is also the prevalence of widespread species admixtures – including, substitution and adulteration – in raw herbal trade, which could potentially endanger the health and safety of consumers and discredit indigenous medical practices.

ATREE is engaged in the identification of medicinal plants that go into making herbal products. With support from Department of Biotechnology (DBT), Government of India, and in collaboration with the University of Agricultural Sciences, GKVK, Bangalore, a DNA barcode library of important medicinal plants of India has been established and a Biological Reference Material (BRM) of over 150 traded medicinal plant species has also been developed.



Phenological events over time reflect environmental variability and change, however, phenology in the long-term has not been monitored in India





Adulteration and species admixtures are rampant in the Medicinal Plant Industry in India

Further, analysis of some market samples (collected from different locations in South India) revealed large-scale adulteration in the herbal markets. The species adulteration ranged from 25% to 100%. Endangered medicinal plants such as *Coscinium fenestratum* and *Embelia ribes* are prone to adulteration, perhaps due to their limited availability. Species sharing common vernacular names were often adulterated, as in the case of *Tinospora sinensis* being sold as *Tinospora cordifolia*. Similarly, co-occurring species that are morphologically similar were also often adulterated, as in the case of *Sida*, *Boerhavia diffusa* and *Plumbago zeylanica*.

Trade of raw herbal dry material is deeply compromised by widespread species adulteration and admixtures. In this regard, there is a need to develop a regulatory mechanism that can authenticate and regulate the raw herbal trade. Unless, there are strict measures to monitor the extent and nature of the material used for the preparation of the health products, consumer health will be at stake. Development of a comprehensive herbal product authentication system, incorporating elements ranging from unique identifiers to trade policy must be the way forward to regulate raw herbal trade and

regain consumer confidence. Central to such a regulatory framework is the need to develop an efficient mechanism to assess the authenticity of the raw herbal products and link it up with trade regulators, both nationally and internationally. Further, establishment of multiple crude drug repositories to maintain authentic botanicals as reference standards can be developed to encourage industry, traders and researchers for their comparative identity tests and regulate the trade of certified authentic herbal products. This will also make the herbal medicines more credible and acceptable.



## SURI SEHGAL CENTRE FOR BIODIVERSITY AND CONSERVATION

# Ecosystem Services and Human Well being

The goal of this programme is to understand and communicate the complex bio-physical, ecological, socio-ecological, economic and political dimensions of ecosystem services with their implications for equity and sustainable management of ecosystem services.

### MANAGING AND GOVERNING SOCIO-ECOLOGICAL SYSTEMS IN THE EASTERN HIMALAYAS

'Integrated approaches for adaptive resilience-based forest for supporting agro-systems in Sikkim Darjeeling Himalayas,' a project funded by the Tata Social Welfare Trust (TSWT), is being implemented in this biodiversity hot-spot, to understand how social-ecological systems in the Eastern Himalayas can be managed and governed. The project aims to facilitate the generation of a sustained supply of ecosystem services that can satiate the needs of local communities without impairing key ecosystem attributes and functions such as nutrient cycling, ground water recharge, biodiversity, etc.

The project also assesses key social attributes and functions necessary for maintaining resilience in the face of land-use changes and climate uncertainties. Preliminary interactions in the field revealed that communities living in proximity to forests are highly dependent on the ecosystem's provisioning of goods and services such as fuel-wood, fodder, water, and regulatory services of pollination for their subsistence as well as livelihoods. They also draw aesthetic and recreational benefits from the landscape while being exposed to various levels of human-wildlife conflict, which is a key dis-service.

Following initial interactions, a conceptual framework that linked ecosystem function, ecosystem services and human capabilities was developed, based on certain underlying assumptions that were not included in the Millennium Ecosystem framework.

An interdisciplinary research team from ATREE is measuring the condition of the forest in terms of desirable ecosystem functioning to understand how ecosystem services support or constrain human

well-being and whether well-being, in terms of capabilities or substantial freedoms to 'be' and to 'do', ensures a continued flow of ecosystem services. A brief elaboration of what this entails as an interdisciplinary effort is in order. Through the community, the team identified minimally disturbed forests, which were used as a reference to study resource rich and poor areas, services and the forest's re-stocking ability. The community identified popular bird trails that helped the team assess bird diversity, which is also an indicator of cultural services. The team also collected information on water quality and water source habitats and conducted in depth surveys of households to assess how ecosystem services provided for or supported human well-being.



Rice Fields in Sikkim post-harvest



**MAKING SUSTAINABLE USE OF BIO-RESOURCES IN THE SIKKIM HIMALAYAS**

Changing climate and rapid land-use and land-cover changes have ensured that access to water is becoming a challenging prospect for human survival. To effectively mitigate the hydrological adversities, vegetation itself is greatly affected by changes in moisture regimes; this interplay is best explored with an eco-hydrological framework. However, inadequate climatic data and lack of regional studies limit our understanding of climate change and its impacts on eco-hydrological processes, especially in pan-tropical mountains like Sikkim Himalayas.

A five-year collaborative project between ATREE and the National Centre for Biological Sciences (NCBS), funded by the Department of Biotechnology (DBT), Government of India, is attempting to address these gaps in knowledge and action in order to further our knowledge on biodiversity in the Eastern Himalaya region, with the initial focus on Sikkim. The project is identifying linkages between biodiversity and the functioning and stability of ecological communities and investigating the potential consequences of climate change for biodiversity configuration and the provisioning of ecosystem goods (bio-resources) and services to humans. The project will also build capacity of local communities to sustainably use bio-resources and adapt to climate change.

The results yielded by a study, conducted under this project, which characterizes the eco-hydrology of the Sikkim Himalaya in the context of climate variability and climate change highlights contrasting behavior in the streams originating from different forest-types. The Ekgothe stream (sub-alpine conifer forests in Kyongnosla Alpine Sanctuary) shows a five-time higher runoff generation in high-flows in comparison to the Fambongloh stream (temperate broad-leaved forests). This disparity in the runoff of streams originating from different forest-types highlights the importance of temperate broad-leaved tree cover in mitigating runoff generation and the unique characteristics of the boggy valleys in the alpine streams.

Contrastingly, it's the alpine stream, which seems to maintain steadier low-flows than the temperate stream indicating possible dual role of lower transpirational losses and contribution of snowmelt. With a large majority of the Sikkim's forests lying outside protected areas (PA), it is imperative to pay some attention to them in terms of biodiversity richness and the ecosystem services they provide. Another study, looking at the role of these fragmented patches in provisioning ecosystem services outside protected areas using Sikkim mandarin orange (*Citrus reticulata*) as focal species, establishes the dependence of Sikkim mandarin orange on pollinators for better fruit-set.

Access to water is becoming a challenging prospect for human survival owing to climate change and rapid land use and land-cover changes



CENTRE FOR ENVIRONMENT AND DEVELOPMENT

**Forests and Governance**



The goal of the Forests and Governance programme is to understand what combinations of governance regimes, economic policies, cultural changes and biophysical measures will lead to better forest governance in South Asia, i.e., more sustainable, equitable and livelihood-enhancing outcomes, and strong democratic processes. The focus is on understanding the role of rights, institutions and governance mechanisms, the conditions for sustainable use, and the extent and nature of economic and cultural dependence.





### SENTINEL LANDSCAPES – MONITORING LAND, FOREST RESOURCE AND LIVELIHOOD

ATREE is participating in the Sentinel Landscapes Framework Assessment, a research programme of global scale, conceptualized and funded by the World Agroforestry Centre (ICRAF). The purpose of this project, conducted globally across six biodiversity hotspots, is to measure changes and understand long-term trends in socio-economic and biophysical variables across the 'forest transition curve.' These landscapes of socio-ecological importance are being monitored for a broad range of biophysical, social, economic and political measures over a long period of time. This project examines the relationship between livelihoods and land health in forested landscapes that have undergone land-use change using long-term ecological and socio-economic data from across cultures, institution types and governance styles. This project in the Western Ghats combines village-level data snapshots with a global perspective on the issue.

ATREE's work extends across four districts: Chamarajanagar, Kodagu, Nilgiris and Wayanad, where data collection through socioeconomic surveys is being carried out.

This data will be used to do a comparative study of the landscape to find out the institutional settings that favour an equitable utilization of forest resources and associated benefits, and identify conditions that allow farmers to significantly capitalize on tree products and benefit from them as well as factors that induce people to value the ecosystem services.

For these purposes village-level data will be linked with land health indicators. The derived land health indicators will not only facilitate the assessment of the status of the land and vegetation during the time of sampling, but also help model how the landscape was 10 to 15 years ago. For each village, a trajectory of change can therefore be constructed. ATREE completed data collection in Chamarajanagar and Kodagu districts last year, and surveyed a total of 320 households in Wayanad and 324 in Nilgiris.

Preliminary findings indicate that most of the households were engaged in farming and only Katunayaka community depends on the forest for subsistence. Other ethnic and religious groups depend on the forest chiefly for collecting firewood.



Forests, agriculture and agro-forestry are sources of livelihood for local communities

The households that engaged in farming were involved in the commercial cultivation of finger millet, paddy, coffee, tea, pepper, tubers like tapioca and vegetables like carrot, cabbage and so on. In Wayanad, most of the settlements shared the forest resources with other settlements.

### FORESTS FOR BIODIVERSITY AND WELLBEING

South Asia's globally unique forests are changing rapidly and changes in forest cover correlate with radical alterations in people's interactions with them. Such interactions include changes in land use and land cover, population growth and demographic change, technological developments, growing economic integration of rural and urbanizing areas, spread of invasive species and changes in local and regional climate regimes. To address some of these issues, the USAID-funded Forests for Biodiversity and Wellbeing project is being implemented at five sites in India; two in Darjeeling Hills – Singalila National Park and Sanchel Wildlife Sanctuary – in the Eastern Himalayas, and three in the Western Ghats – the Biligiri Rangaswamy Temple Tiger Reserve, Cauvery Wildlife Sanctuary and Malai Mahadeswara Wildlife Sanctuary. The main issues this project addresses are increasing the income of forest-dependent communities through improved management of agriculture and NTFP species, introducing innovations in fuel wood management and strengthening systems of forest resources management.

The project not only focuses on introducing new agricultural products and techniques so as to help villagers add value to NTFPs, but also helps them understand and mitigate human-wildlife conflict. Moreover, efforts to explore new options for off-farm employment are also ongoing.

Secondly, the project works on reducing fuel wood consumption by scaling up the sale, marketing and distribution of Improved Cook Stoves (ICS), in the Darjeeling Hills, via private-sector collaborations.

The project also helps strengthen systems of forest resource management, at the local level, through research on the population genetics of important NTFPs. This entails working with local and district-level governmental planning agencies to improve environmental governance, assessing current and likely future impacts of tourism on forests and resources and leading a new regional stakeholder forum for climate awareness across the Eastern Himalayas.



Many forest dependent communities rely on the sale of non-timber forest produce to earn a living

The ultimate goal of this project is to develop a robust and innovative model of managing forest ecosystems and societal interactions in the face of global environmental and economic change. This model will integrate scientific knowledge, local community perceptions, action-oriented research findings and initiatives for the co-management of natural resources. Having completed its first year, the project has extended its Conservation and Livelihood initiatives to 8 new villages in Sanchel Wildlife Sanctuary area and 12 in Singalila National Park. With this, the Conservation and Livelihoods initiative covers over 1,400 households in 30 villages. Additionally, several inception meetings and socio-economic surveys have been initiated in 14 villages. In the Western Ghats, long-term monitoring work on four important NTFPs, such as *Phyllanthus emblica*, *Terminalia chebula*, *Boswellia serrata* and honey, has been ongoing at all three selected sites.

In addition to monitoring invasive species, corridor restoration work is also in progress. To bring community participation in conservation, we established two decentralized NTFP processing units for value addition.



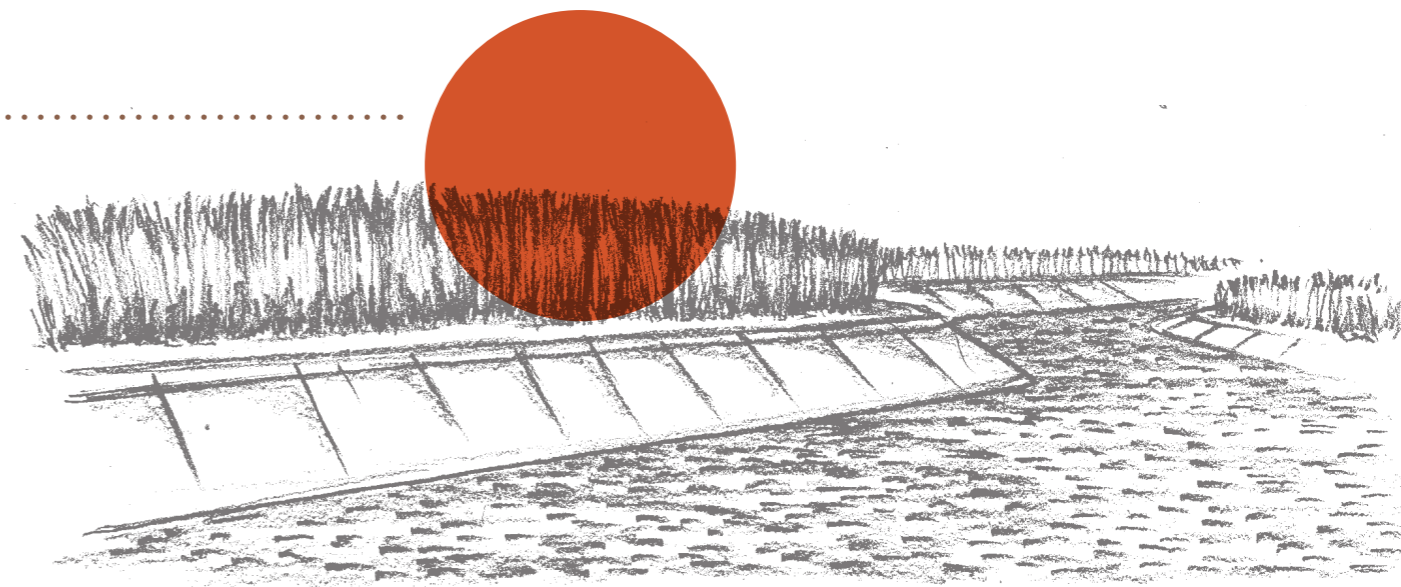
CENTER FOR ENVIRONMENT AND DEVELOPMENT

## Land, Water and Livelihoods

The goal of this programme is to understand the trends and drivers of change in land and water stressed regions and urban-rural interfaces with respect to water availability, water quality, land degradation, food security and provisioning of environmental services by agro-ecosystems. It seeks to identify appropriate practical and policy strategies that promote environmental sustainability and human well-being.



Nutrient Rich wastewater, often contaminated with heavy metals, being used to irrigate farms



### ADAPTING TO CLIMATE CHANGE IN URBANIZING WATERSHEDS

The Intergovernmental Panel on Climate Change (IPCC) highlights possible climate change impacts on freshwater resources and vulnerabilities to water security in developing countries. Empirical studies on climate vulnerability assessment in developing countries have proliferated in recent years. While these, by definition, are interdisciplinary exercises linking biophysical and social processes, in practice, integration, both across disciplines and across the research-policy divide, has remained a challenge for several reasons:

#### I. MULTIPLE STRESSORS:

Climate change is not the only problem in these rapidly changing regions – urbanization, land use change, demographic change and industrialization are immediate factors shaping the movement and availability of water. Therefore, climate change must be studied as one of many stressors.

#### II. MULTIPLE CONCERNS:

Vulnerability to climate change is often not the primary concern. Local stakeholders and policy makers are equally concerned with immediate sustainability, equity and access issues.

#### III. MISSING LINKAGES:

In urbanizing areas, people are not directly dependent on or exposed to the natural environment. Instead, water is transported, delivered and managed through reservoirs, pipes, drains etc, managed by an array of government and private agencies, which mediate between the available water resources and the end users.

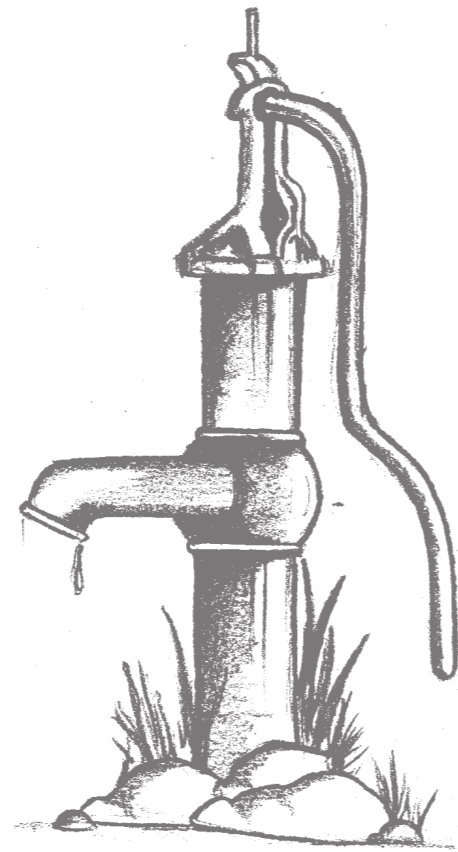
The Adapting to Climate Change in Urbanizing Watersheds (ACCUWa) project, which was launched in September 2012, attempts to address precisely these gaps at two sites –the Arkavathy in Karnataka and Noyyal in Tamil Nadu. Based on a common conceptual framework, over 30 researchers, field staff and faculty representing a range of disciplines have been engaged in field research, analysis and modelling at the two urbanizing watersheds. The research has involved extensive household and farm surveys in both sites, field hydrology studies and modelling efforts, water quality sampling and analyses, satellite imagery analysis and GIS mapping, hundreds of interviews, focus group discussions, stakeholder outreach and expert consultation workshops and a water literacy campaign. These studies have already resulted in several reports, peer-reviewed publications and have received extensive media coverage.

In both sites, the research shows that land, labour and commodity markets have transformed the practice of agriculture but in different ways upstream and downstream of cities. Upstream, as labour for agriculture becomes scarce and the lucrative urban market grows, most farmers move away from traditional food grain crops and subsistence agriculture to commercial horticulture and floriculture (if they have borewells) or eucalyptus plantations (if they do not have borewells). Competitive drilling of borewells, expansion of deep-rooted eucalyptus plantations, commercial agriculture and free electricity have resulted in a steep decline in groundwater. Field hydrology studies show the decline in groundwater has resulted in the drying up of streams as well. Downstream of the urban areas, the story has been quite different. 'Nutrient rich' wastewater from the city, typically untreated, has allowed for an expansion of irrigated agriculture, again supporting commercial crops like baby corn, fodder and mulberry.

However, in the Arkavathy site, water quality studies show that the wastewater used for irrigation also contains heavy metals from industrial discharges, which make their way back into the food chain. The ACCUWa project research also examines the governance of water and wastewater in the two sites and the coping mechanisms that users have adopted.



Baby corn fields irrigated using contaminated tank water in peri-urban areas of Bangalore



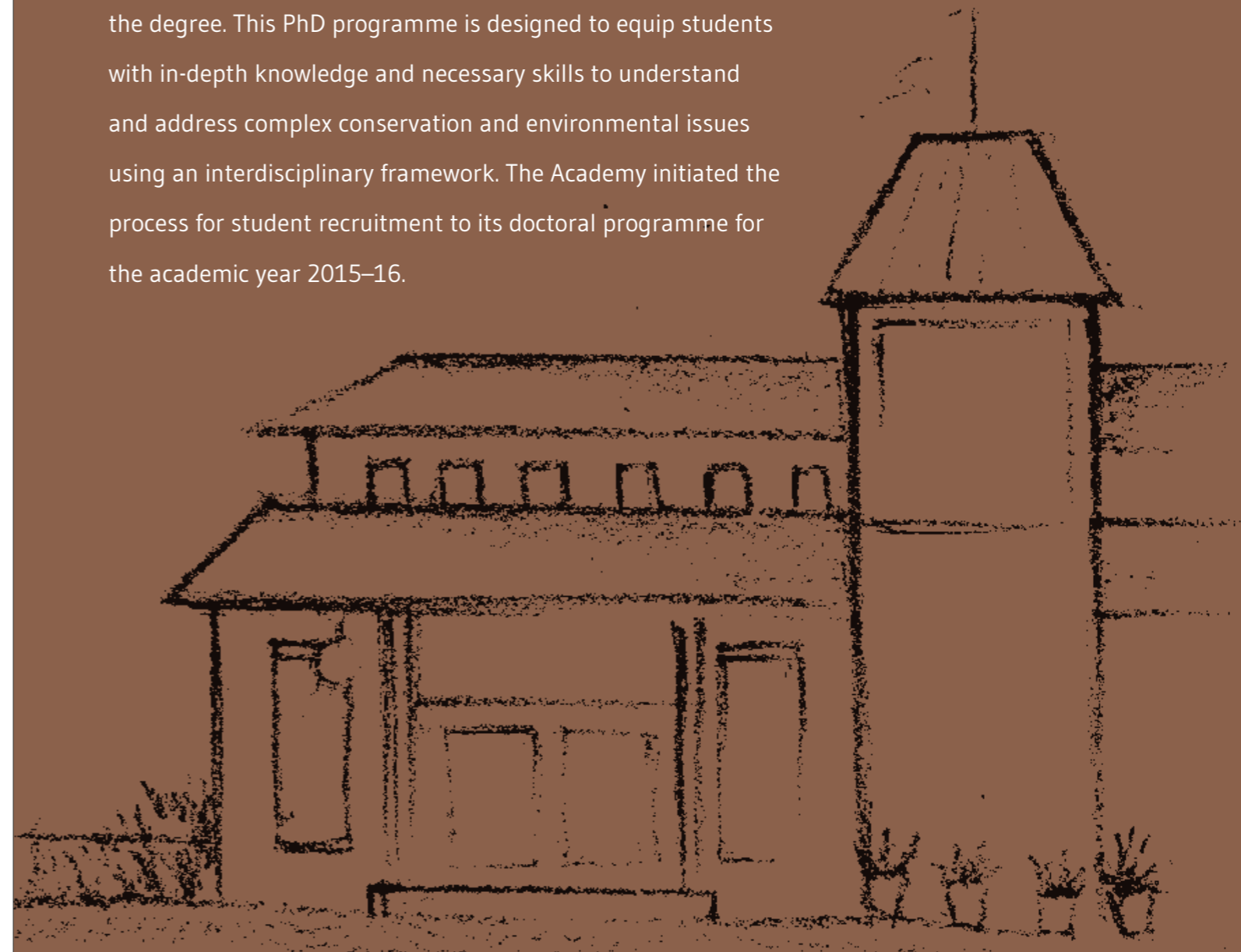
## ACADEMY FOR CONSERVATION SCIENCE AND SUSTAINABILITY STUDIES

41  
PUBLIC TALKS

17  
INTERNAL TALKS

29  
INTERNS

Manipal University recognizes ATREE's doctoral programme in Conservation Science and Sustainability Studies and awards the degree. This PhD programme is designed to equip students with in-depth knowledge and necessary skills to understand and address complex conservation and environmental issues using an interdisciplinary framework. The Academy initiated the process for student recruitment to its doctoral programme for the academic year 2015-16.





The academy for conservation science at ATREE regularly holds talks, lectures, movie screenings, etc on environmental topics as well as developmental issues



Fundamental courses taught in the first semester include Ecology, Environmental Science, Economics for Environment and Development, Sociology and Anthropology for Environment and Development, basic Math and English. Core and elective courses in second and third semesters of the PhD programme for the 2013 batch students included Practicing Interdisciplinary Research on the Environment, Research Methods in Social Sciences, Research Methods in Natural Sciences and Quantitative Methods. Additionally, elective courses offered in the second and third semesters included Systematic Biology, Plant - Animal Interactions for Conservation, Landscape

Ecology, GIS and Remote Sensing of the Environment, Gender and Environment, Invasive Species – Ecology, Impacts and Management, Environmental Anthropology, Introduction to Political Ecology.

As part of the course work, the Academy invited Yateendra Joshi from World Institute of Sustainable Energy, Pune to offer a course in science communication. The course was designed to improve students' performance in writing reports, submitting research papers to journals, presenting their work in seminars and conferences, writing research proposals for funding and improving their communication skills.

#### STUDENT UPDATES

**Rajkamal Goswami**, a PhD student, earned his doctorate on "Forest cover, hunting and animal abundance across state and community forests of Meghalaya, India."

Five students made their synopsis presentations, three students registered with Manipal University, and another three made their thesis pre-submission presentations at ATREE.



The Academy hosted 41 public talks as part of Talks@ATREE series, a weekly public talk and discussion series that invites researchers, practitioners, journalists, artists and collectives to share their insights on completed research and projects.

Additionally, there were 17 internal talks from doctoral students and researchers from within and outside ATREE.

#### INTERNSHIPS

Twenty nine students from India and abroad interned with ATREE this year.

#### STUDENT ACHIEVEMENTS AWARDS/INVITES

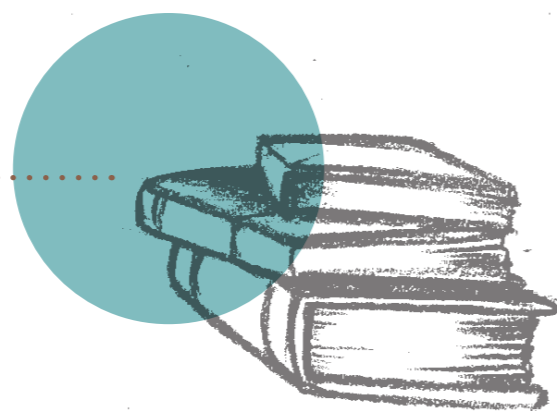
##### CHANDRIMA HOME, PHD BATCH 2009, & HITA UNNIKRISHNAN, BATCH 2011,

Got the Best Student Talk Award at the 2014 Student Conference on Conservation Science, Bangalore for, Predation 'dog'ma: patterns of livestock depredation by a free ranging commensal in the Upper Spiti landscape, Himachal Pradesh; and Historical contestations around an urban lake: lessons learnt for lake management in Bangalore city, respectively.

##### POORNA BALAJI

Delivered a talk 'Balancing Out Forests: Implications of the Forest Conservation Act, 1980 in Southern Odisha, India' at the Seventh South-South conference on 'Inequality, democracy and development under neoliberalism and beyond,' organized by International Development Economic Associates (IDEAs), Council for the Development of Social Science Research in Africa (CODESRIA) and the Latin American Council of Social Sciences (CLACSO), in Bangkok, Thailand, in November 2014.

## Student Publications



**Gururaja, K. V., K. P. Dinesh, H. Priti and G. Ravikanth.** 2014. Mud-packing frog: a novel breeding behaviour and parental care in a stream dwelling new species of *Nyctibatrachus* (Amphibia, Anura, Nyctibatrachidae). *Zootaxa* 3796 (1): 033–061.

–  
**Goswami, R. and T. Ganesh.** 2014. Carnivore and herbivore densities in the immediate aftermath of ethno-political conflict: The case of Manas National Park, India. *Tropical Conservation Science* 7 (3):475–487.

–  
**Kumara, H. N., O. Thorat, K. Santhosh, R. Sasi and H. P. Ashwin.** 2014. Small carnivores of Biligiri Rangaswamy Temple Tiger Reserve. *Journal of Threatened Taxa* 6(12): 6534–6543.

–  
**Unnikrishnan, H. and H. Nagendra.** 2014. Unruly commons: contestations around Sampangi Lake in Bangalore. *Nehru Memorial Museum and Library Occasional Paper. Perspectives in Indian development. New series* 39.

**Priti Gururaj.** Relic forest, tadpoles and foot-flagging frogs. *Sanctuary*. June 2014.

–  
**Goswami, R.** How clean are our forests? *Down to Earth*. 4 December 2014. Also, *Cleanliness beyond cities, celebrities and tokenisms*. *Shillong Times*. 26 November 2014.

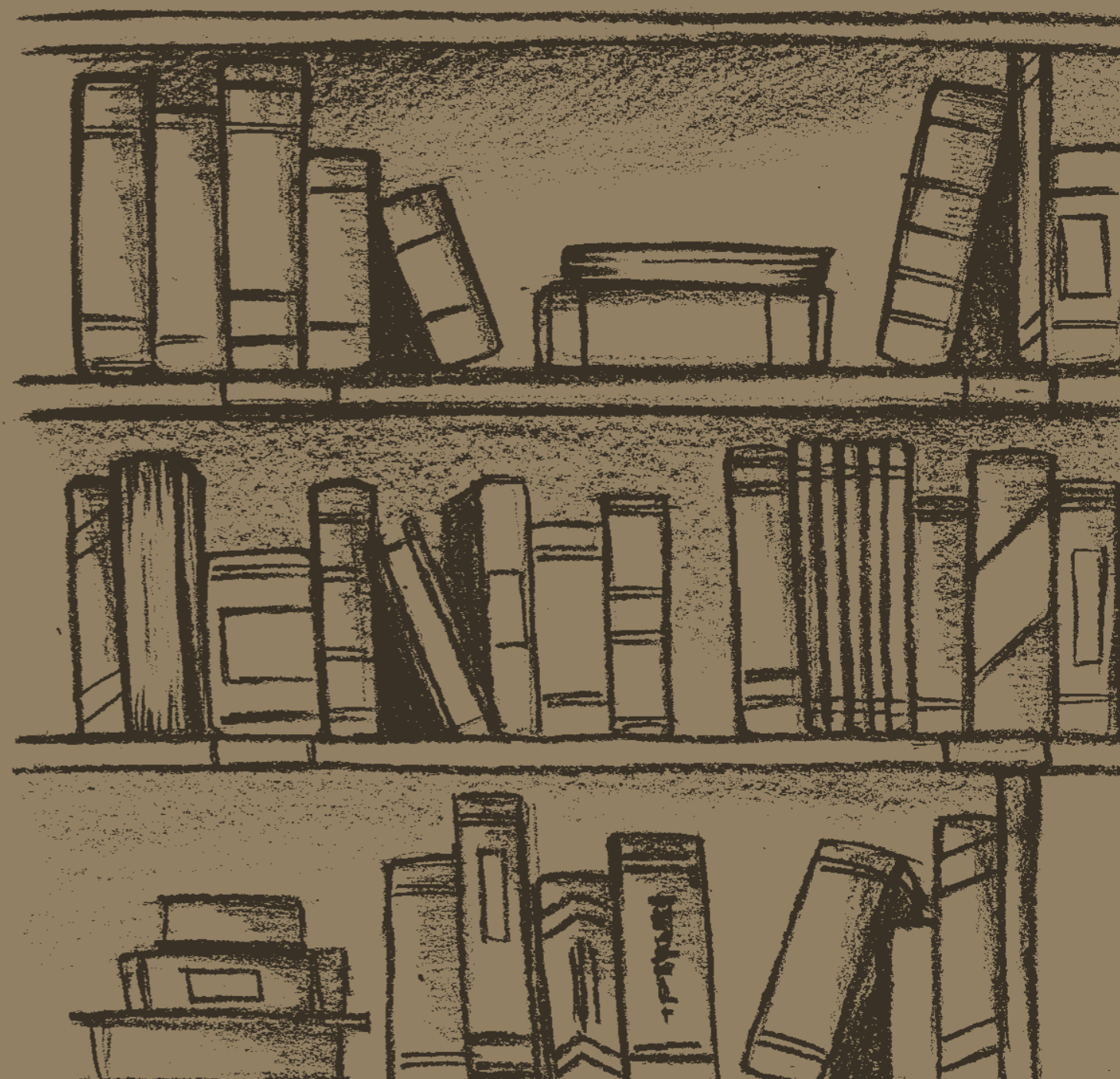
–  
**Pradhan, U.** Sikkim's ecological fragments. *Himal*. December 2014.

–  
**Gururaj, P.** Poster presentation, 'Effects of habitat fragmentation on stream dwelling frogs from Central Western Ghats'. *Michigan Complexity Mini Conference (MCMC), University of Michigan*. 9 May 2014.

## PUBLICATIONS

### BOOKS

1. **T. Ganesh, A. Jesudasan and M. Mathivanan.** 2015. *A Tamil and English field guide to the Wetland Birds of south Tamil Nadu*. Pub.ATREE.
2. **Lele, S. and A. Menon (Eds).** 2014. *Democratizing forest governance in India*. India: Oxford University Press.





## BOOK CHAPTERS

1. **Swamy, S.** and **M. Soubadra Devy.** 2014. *Reshaping neighborhood parks for biodiversity and people: a case of unsung socio-ecological systems in Bangalore, India.* In: Social-ecological systems in transition, Global Environmental Studies (Eds. S. Sakai and C. Umetsu). Pp. 88-103 Japan: Springer.
2. **Thomas, B.K.** 2014. 'Monetary and Multidimensional Poverty in Kerala: A Review of Recent Evidence', In: *Kerala Economy and its Emerging Issues, Kottayam* (eds. Kurian V. M and R. John): SPCS, 238-51.
3. **Thomas, B.K., P. Jamwal, S. Lele & V. Srinivasan,** 2014, 'Thinking About Urban Resilience: The Case of Water Scarcity and Wastewater Reuse in Bengaluru', *Urban Resilience: Proceedings of the Colloquium, Bengaluru: Public Affairs Centre, ISBN 9788188816378.*
4. **Lele, S.** 2014. What is wrong with Joint Forest Management? In: *Democratizing Forest Governance in India* (eds. Lele, S. and A. Menon). Pp. 25-62. New Delhi: Oxford University Press.
5. **Lele, S.** and A. Menon. 2014. Epilogue. In: *Democratizing Forest Governance in India* (eds. Lele, S. and A. Menon). Pp. 402-414. New Delhi: Oxford University Press.
6. **Lele, S.** and A. Menon. 2014. Introduction: Forest Governance beyond Joint Forest Management, Godavarman, and Tigers. In: *Democratizing Forest Governance in India* (eds. Lele, S. and A. Menon). Pp. 1-22. New Delhi: Oxford University Press.
7. Menon, A., V. Lobo and **S. Lele.** 2014. The Commons and Rural Livelihoods: Shifting dependencies and supra-local pressures. In: *Democratizing Forest Governance in India* (eds. Lele, S. and A. Menon). Pp. 376-401. New Delhi: Oxford University Press.
8. **Jamwal, P., B.K. Thomas, S. Lele and V. Srinivasan.** (2014). *Addressing water stress through wastewater reuse: complexities and challenges in Bangalore, India.* In: *5th Global Forum on Urban Resilience & Adaptation.* Organised by ICLEI. Bonn. Germany. 29-31 May 2014.
9. **Maurya, N.** 2015. Development, displacement and health: Tribal women's sufferings from diseases of development. In: *Health and tribes in India challenges and opportunities* Das K.N.(Ed.). Sarup Book publishers (P) Ltd. ISBN is 978-81-7625-983-5.

## PEER REVIEWED PUBLICATIONS

1. Kumara, H. N., **O. Thorat,** K. Santhosh, R. Sasi and H. P. Ashwin. 2014. Small carnivores of Biligiri Rangaswamy Temple Tiger Reserve. *Journal of Threatened Taxa* 6(12):6534-6543.
2. **N. Maurya.** 2014. Science, Society and Risk in the Anthropocene. *Economic and Political Weekly.* 49(41).
3. **Krishnaswamy, J.,** S. Vaidyanathan, B. Rajagopalan, M. Bonell, M. Sankaran, R. S. Bhalla and **S. Badiger.** Non-stationary and non-linear influence of ENSO and Indian Ocean Dipole on the variability of Indian monsoon rainfall and extreme rain events. *Climate Dynamics* DOI: 10.1007/s00382-014-2288-0.
4. Athreya, V., M. Odden, J. D. C. Linnell, **J. Krishnaswamy,** K. U. Karanth. 2014. A cat among the dogs: leopard *Panthera pardus* diet in a human-dominated landscape in western Maharashtra, India. *Oryx* 1 DOI:10.1017/S0030605314000106.
5. **R. Goswami** and **T. Ganesh.** Carnivore and herbivore densities in the immediate aftermath of ethno-political conflict: The case of Manas National Park, India. *Tropical Conservation Science* 7 (3):475-487.
6. David, P., R. Manakandan, **T. Ganesh.** 2015. Frugivory and seed dispersal by birds and mammals in the coastal tropical dry evergreen forests of southern India: a review. *Tropical Ecology* 56(1): 41-55.
7. Ismail, S. A., J. Ghazoul, **G. Ravikanth,** C. G. Kushalappa, R. Uma Shaanker, and C. J. Kettle. 2014. Fragmentation genetics of *Vateria indica*: implications for management of forest genetic resources of an endemic Dipterocarp. *Conservation Genetics.* DOI: 10.1007/s10592-013-0559-7.
8. Ismail, S. A., J. Ghazoul, **G. Ravikanth,** C. G. Kushalappa, R. Uma Shaanker, and C. J. Kettle. 2014. Forest trees in human modified landscapes: ecological and genetic drivers of recruitment failure in *Dysoxylum malabaricum* (Meliaceae). *PLoS ONE* 9(2): e89437.
9. N. Sapna Bai, O. K. Remadevi, T. O. Sasidharan, M. Balachander and **P. Dharmarajan.** 2014. Cuticle degrading enzyme production by some isolates of the entomopathogenic fungus, *Metarhizium anisopliae* (Metsch). *Journal of Bio-Science* 20: 25-32.

10. Savitha M., **Jojo T. D.** and G. Kuriakose. 2014. Interspecific interaction between *Cryptocoryne* sp. and *Ectoparasitiscus suratensis* B. (Pearl Spot) in the estuarine ecosystem of Vembanad Lake in central Kerala. *Heartian Journal of Pure and Applied Sciences* 3(1): 90-98.
11. Senthilkumar, U., R. K. Choudhary, M. Sanjappa, D. Narasimhan, R. Uma Shaanker and **G. Ravikanth.** 2014. Livelihood and revenue: role of rattans among mongoloid tribes and settlers of Andaman and Nicobar islands, India. *Ethnobotany Research and Applications* 12: 141-154.
12. **Shivanna, K. R.** 2014. Reproductive assurance through autogamy in some annual weed species. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences* 84(3): 681-687.
13. **Das, S.,** B. Behera and A. Mishra. 2014. Factors affecting household perception of wetland biodiversity conservation in West Bengal, India. *International Journal of Ecological Economics and Statistics* 34 (3): 72-82.
14. **Nagendra, H.,** and E. Ostrom. 2014. Applying the social-ecological system framework to the diagnosis of urban lake commons in Bangalore, India. *Ecology and Society* 19(2): 67.

15. **Kannan, R.,** C. M. Shackleton and R. Uma Shaanker. 2014. Invasive alien species as drivers in socio-ecological systems: local adaptations towards use of *Lantana* in Southern India. *Environment, Development and Sustainability* 16: 649-669.
16. Gururaja, K. V., K. P. Dinesh, H. Priti and **G. Ravikanth.** 2014. Mud-packing frog: A novel breeding behaviour and parental care in a stream dwelling new species of *Nyctibatrachus* (Amphibia, Anura, Nyctibatrachidae). *Zootaxa* 3796 (1): 033-061.
17. **Srinivasan, V.** and S. Kulkarni. 2014. Examining the emerging role of groundwater in water inequity in India. *Water International* 39 (2): 172-86.
18. Sivapalan, M., M. Konar, **V. Srinivasan,** A. Chhatre, A. Wutich, C.A. Scott, J.L. Wescoat, and I Rodríguez Iturbe. 2014. Socio hydrology: use inspired water sustainability science for the Anthropocene. *Earth's Future*, 2, 225-230.
19. Divya Gopal and **Harini Nagendra.** 2014. Vegetation in Bangalore's slums: boosting livelihoods, well-being and social capital. *Sustainability* 6: 2459-2473.
20. Ticktin, T., **R. Ganesan, P. Mallegowda** and **S. Setty.** 2014. Disentangling, again, the drivers of population



decline for two harvested species: a response to Prasad et al. 2014. *Journal of Applied Ecology*. 51: 648–654.

21. **N.A. Aravind**, R.R. Sarma, **M. Munsu** and S. Sen. 2014. In search of *Corilla anax* (Corillidae), rare and endemic land mollusc of the Western Ghats. *Tentacle* No. 22 March 2014: 7–9.
22. **Srinivasan, V.**, D. Suresh Kumar, P. Chinnasamy, S. Sulagna, D. Sakthivel, P. Paramasivam, **S. Lele**. 2014. Water management in the Noyyal river basin: A situation analysis. *Environment and Development Discussion Paper No. 2. Bengaluru: Ashoka Trust for Research in Ecology and the Environment*.
23. **Lele, S.**, R. Venkat Ramanujam, J. Rai, 2015. Co-operative procurement and marketing of tendu leaves in Madhya Pradesh: Image and reality. *Environment and Development Discussion Paper No.3. Ashoka Trust for Research in Ecology and the Environment, Bengaluru*.
24. Hebbar, Gururaja K.V. and **Ravikanth G.** 2015. Morphology, natural history and molecular identification of tadpoles of three endemic frog species of *Nyctibatrachus* Boulenger, 1882 (Anura: Nyctibatrachidae) from Central Western Ghats, India. *Journal of Natural History*. <http://dx.doi.org/10.1080/00222933.2015.1034212>
25. Senthilkumar U, Narasimhan D, Sanjappa M, Uma Shaanker R, and **Ravikanth G.** 2015. Species delimitation in congeners of Genus *Daemonorops* from India using DNA barcodes. *Communications in Plant Sciences* 5 (1-2): 1–8.
26. S.Paul, **H.Nagendra**. 2015. 'Vegetation change and fragmentation in the mega city of Delhi: Mapping 25 years of change'. *Applied Geography*. 58: 153–166.
27. **Jamwal, P.**, T. Md. Zuhail, P. R. Urs, V. Srinivasan and S. Lele. 2015. Contribution of sewage treatment to pollution abatement of urban streams. *Current Science* 108(4): 677–685.
28. Paul, S. and **H. Nagendra**. 2015. Vegetation change and fragmentation in the mega city of Delhi: mapping 25 years of change. *Applied Geography* 58:153–166
29. **Mallegowda, P., R. Ganesan, J. Krishnan and M. Niphadkar.** 2015. Assessing habitat quality of forest-corridors through NDVI analysis in dry tropical forests of south India: implications for conservation. *Remote Sensing* 15(7): 1619–1639.

#### POPULAR PRESS

1. Janardhana K. Thippagondanahalli Reservoir: What Next?. *Prajavani* 26th Feb 2015.
2. Anusree, A. S. and O. Thorat. The grass is greener. *Living Landscapes*. February 2015: 20–23.
3. Pradhan, U. Sikkim's ecological fragments. *Himal*. December 2014.
4. Goswami, Rajkamal. How clean are our forests? *Down to Earth*. 4 December 2014.
5. Goswami, Rajkamal. Cleanliness beyond cities, celebrities and tokenisms. *Shillong Times*. 26 November 2014.
6. Ramachandran, V. Security threat to hornbill. *Down to Earth*. August 2014.
7. Harisha, R. P. Crunchy, juicy devil's backbone. *Down to Earth*. June 2014.
8. P.Gururaj. Relic forest, tadpoles and foot-flagging frogs. *Sanctuary*. June 2014.
9. Jesudasan.A and T. Ganesh. Investment trick. *Down to Earth*. 31 May 2014.
10. Rajkamal Goswami Cleanliness beyond cities, celebrities and tokenisms. *Shillong Times*. 26 November 2014.
11. V.Ramachandran. Security threat to hornbill. *Down to Earth*. August 2014.

## OUTREACH & CAPACITY BUILDING

### CITIZEN SCIENCE, KNOWLEDGE PORTALS, GRANTS AND COMMUNITY-BASED CONSERVATION CENTRES (CCCS)





- Arkavathy Water Literacy Campaign was launched as part of the Adapting to Climate Change in Urbanizing Watersheds (ACCUWa) project to help local communities understand, support, participate in and learn from the research. Two 'Community Weather Stations' have also been installed at two milli-watersheds.
- ATREE's Vembanad Community Environmental Resource Centre (CERC) lays great emphasis on community awareness and outreach programmes. Vembanad Bio-blitz, a joint project initiated by ATREE CERC, India Biodiversity Portal, Wipro Foundation and the Jalapaadom schools with an aim to enhance, monitor and document biodiversity of the Vembanad area, was inaugurated last year. ATREE CERC is working with communities in Vembanad to address the prevalent drinking water issues and involve stakeholders to widen lake conservation activities. Six community managed drinking water systems have also been inaugurated.
- ATREE coordinated a study-abroad programme with Earth Institute Center for Environmental Sustainability at Columbia University. This programme offers students a unique opportunity to learn basic skills in ecological field work and apply them to highlight environmental issues using the Western Ghats, one of the world biodiversity hotspots, as a laboratory. Students participated in lectures, fieldwork, laboratory work and exercises. Chosen field-sites were ATREE's community-based conservation centers at Biligiri Rangaswamy Temple (BRT) tiger reserve and Kalakkad Mundanthurai Tiger Reserve (KMTR).
- The conservation education programme was set up by ATREE and WIPRO, which is aimed at developing teaching modules that facilitate teachers and students to interact through field-based activities and learn about Biodiversity and its importance.
- Other outreach activities included a two-day workshop on the identification of knowledge gaps in ecosystem services in the South Asian context attended by 30 participants from India, Bangladesh, Nepal, Bhutan, USA and Singapore. A three-day workshop, co-hosted by Bombay Natural History Society and ATREE, on conservation strategy across countries for the critically endangered white-bellied heron was also organized and attended by conservationists,



ATREE conducted the study-abroad programme with Earth Institute Center for Environmental Sustainability at Columbia University

government and non-government representatives from Bhutan, India, Myanmar and China.

- In a bid to foster responsible in-depth reporting on environmental and developmental issues in India, the Forum for Environmental Journalists in India (FEJI)-ATREE media fellowship, set up in 2013, was extended to journalists, for the second time. This engagement has resulted in a wide array of reportage on environmental issues and ATREE's work.
- To popularize the India Biodiversity Portal (IBP), ATREE organized several campaigns and workshops, where participants were trained in the identification and documentation of trees. Additionally, IBP ATREE team delivered lectures in various colleges and schools in a bid to augment biodiversity documentation and dissemination through IBP.
- The Critical Ecosystem Partnership Fund (CEPF) for the Western Ghats, for which ATREE is the regional implementation team, not only engaged in networking with grantees and donors, but also led efforts to highlight the importance of the conservation of the Western Ghats, a world biodiversity hotspot.

- The 11th TN Khoshoo Award was presented to Prof Mahesh Rangarajan for his contribution to our understanding of nature-society interactions through his ideas and scholarship on history, politics and environment. Instead of a lecture, a panel discussion was conducted featuring Prof Mahesh Rangarajan, researcher and historian, and Director of Nehru Memorial Museum and Library, New Delhi; Praveen Bhargav, Managing Trustee, Wildlife First; and Vidya Athreya, Research Associate, Centre for Wildlife Studies and Wildlife Conservation Society-India chapter. The discussion was moderated by Jairam Ramesh, former Union Minister for Environment as well as Rural Development, who was also the Chief Guest for the event. Another award bearing the Khoshoo title - The Earthian Khoshoo Award 2014 was presented to Indian Institute of Science, Bengaluru and RajakiyaKanya Madhya Vidyalaya, Sasaram, Rohtas.

- The Annual Vembanad Fish Count was conducted with an aim of creating awareness about the state of fishery resources of the Vembanad lake. A participatory water quality monitoring exercise in Vembanad is ongoing where the fisher folk and local people, who have been trained to measure water quality at regular intervals, display it over water quality boards set up in village corners and upload the same on to the project website and India Biodiversity Portal.



Prof Mahesh Rangarajan being presented the TN Khoshoo Memorial award (L-R) Dr Kamaljit Bawa, Prof Mahesh Rangarajan, Raj Khoshoo, Shri Jairam Ramesh

# PEOPLE

## SENIOR MANAGEMENT

- Ganesan Balachander, Director
- Sridhar Ramaswamy Iyengar, Deputy Director, Finance and Administration
- Sarala Khaling, Regional Director, Gangtok
- Nitin Rai, Fellow and Academy Convenor
- Sharachandra Lele, Senior Fellow and Centre Convenor, Centre for Environment and Development
- Jagdish Krishnaswamy, Senior Fellow and Centre Convenor, Suri Sehgal Centre for Biodiversity and Conservation

## FACULTY AFFILIATIONS

### CENTRE FOR ENVIRONMENT AND DEVELOPMENT

#### LAND, WATER AND LIVELIHOODS

- Shrinivas Badiger, Fellow and Programme Leader
- Bejoy Thomas, Fellow
- Priyanka Jamwal, Fellow
- Veena Srinivasan, Fellow
- Durba Biswas, Fellow (Fellow since June 2015)

#### FORESTS AND GOVERNANCE

- Sharachandra Lele, Senior Fellow and Programme Leader
- Nitin Rai, Fellow
- Siddappa Setty, Fellow
- Swati Shresth, Fellow; (left ATREE in December 2014)

### SURI SEHGAL CENTRE FOR BIODIVERSITY AND CONSERVATION

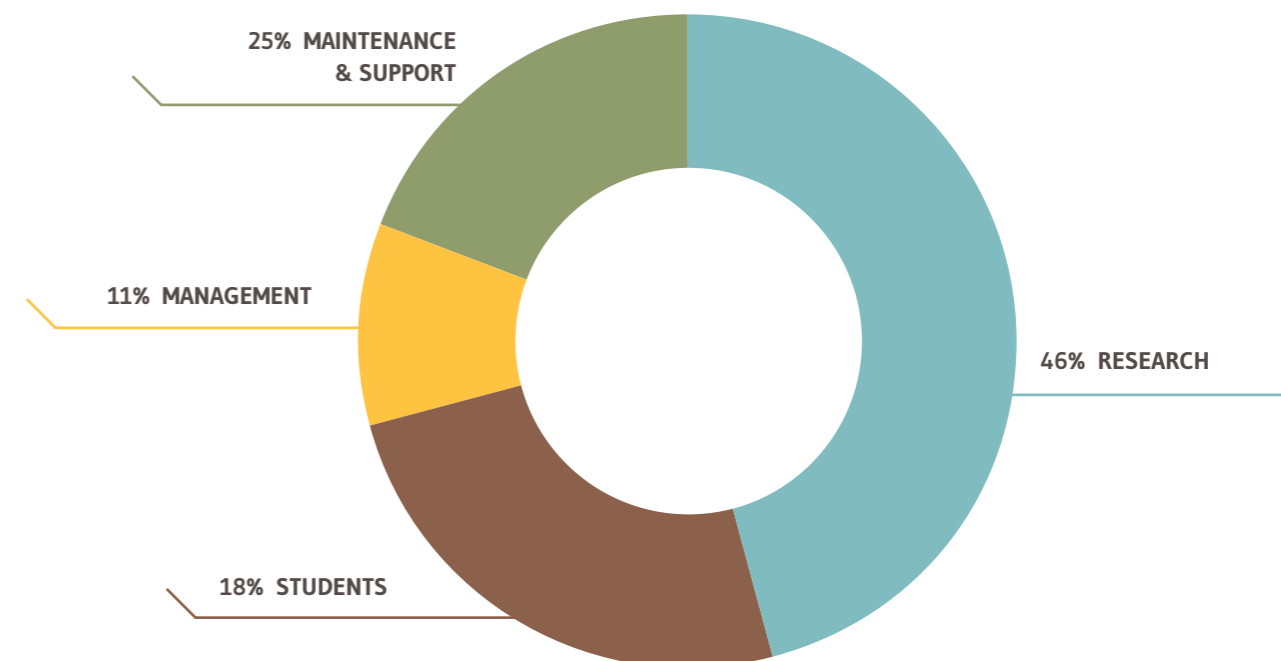
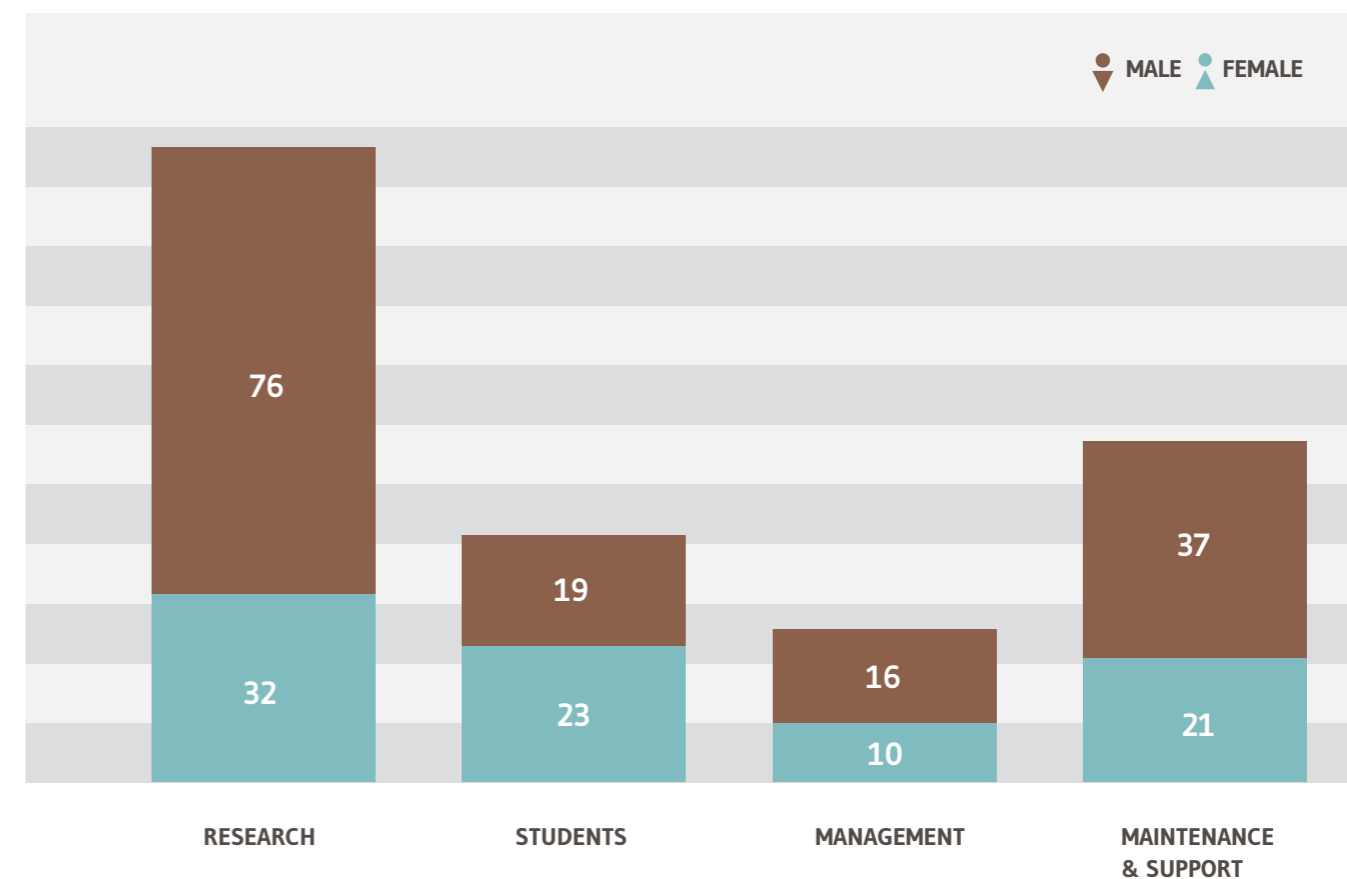
#### ECOSYSTEMS AND GLOBAL CHANGE

- Priyadarsanan Dharma Rajan, Senior Fellow and Programme Leader
- Ankila Hiremath, Fellow and Co-Programme Leader
- Abi Tamim Vanak, Fellow
- Aravind N. A., Fellow
- Ravikanth G., Fellow
- R. Ganesan, Fellow
- T. Ganesh, Senior Fellow

#### ECOSYSTEM SERVICES AND HUMAN WELL-BEING

- Jagdish Krishnaswamy, Senior Fellow and Programme Leader
- Siddhartha Krishnan, Fellow
- Soubadra Devy, Fellow

## GENDER DIVERSITY



\*The figures represent the number of ATREE employees as of 31 March 2015



## FUNDING PARTNERS

### ENDOWMENTS

(Received in financial year 2014-15)

- Ms. Rohini Nilekani, Bengaluru, India
- Sehgal Family Foundation, USA
- Shibulal Family, Bengaluru, India
- Bawa Family, Belmont, USA

### RESEARCH GRANTS

(Sanctioned in financial year 2014-15)

- Department of Biotechnology, Govt. of India
- Collaborative Adaptation Research Initiative in Africa and Asia (International Development Research Centre, Canada and Department for International Development, UK)
- Lancaster University, UK
- Wipro, Bangalore
- Laboratoire d'Economie des Ressources Naturelles, INRA, France
- Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement, ("CIRAD"), France
- Columbia University, USA
- U.S. Agency for International Development
- Department of Anthropology, University of Wyoming (UOW), USA
- The International Centre for Research in Agroforestry (CGIAR centre), Nairobi
- Rufford Small Grants Foundation, London
- Pacific Asia Travel Association (PATA) Foundation, Thailand
- Science & Engineering Research Board (SERB), Department of Science and Technology, Govt. of India
- Bombay Natural History Society (BNHS)
- Karl Kübel Stiftung für Kind und Familie (KKS), Germany
- Conservation Leadership Programme, managed by a consortium of donors including BirdLife International, Fauna & Flora International and The Wildlife Conservation Society



## FINANCIAL STATEMENT

### INDEPENDENT AUDITOR'S REPORT

To the Board of Trustees of Ashoka Trust for Research in Ecology and the Environment (ATREE).

### REPORT ON THE FINANCIAL STATEMENTS

We have audited the accompanying financial statements of Ashoka Trust for Research in Ecology and the Environment (ATREE) Bengaluru 560 064, which comprise the Balance Sheet as at March 31, 2015 and the Income and Expenditure account, Receipts and Payments account and a summary of significant accounting policies for the year then ended.

### MANAGEMENT'S RESPONSIBILITY FOR THE FINANCIAL STATEMENTS

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance and cash flows of the Entity in accordance with the accounting principles generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

### AUDITOR'S RESPONSIBILITY

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### OPINION

- In our opinion and to the best of our information and according to the explanations given to us, the financial statements of ASHOKA TRUST FOR RESEARCH IN ECOLOGY AND THE ENVIRONMENT {ATREE} for the year ended March 31, 2015 are prepared, in all material respects, in accordance with the accounting principles generally accepted in India; that proper books of accounts have been maintained by the trust, so far as appears from our examination of those books; and that the Balance Sheet, Income and Expenditure Account and Receipts and Payments account dealt with by this report are in agreement with the books of accounts.

Place: Bengaluru

Date: 10 July 2014

For G. Anantha & Co.  
Chartered Accountants  
Frn: 005160S  
Rani N. R.  
Partner  
M. No. 214318

# Ashoka Trust For Research In Ecology And The Environment (Atree)

Royal Enclave, Srirampura, Jakkur Post, Bangalore - 560 064, India

BALANCE SHEET AS AT 31ST MARCH 2015				(INR IN LACS )	
SOURCES OF FUNDS		31st March 2015		31st March 2014	
Corpus Fund		3,975.93		3,662.66	
General Fund		73.27		71.75	
<b>UTILISED RESERVES</b>					
• Project Assets		934.42		841.78	
• Other Assets		24.30		30.67	
• Land and Building		404.39		411.40	
Project Fund		1,675.79		1,683.60	
<b>TOTAL</b>		<b>7,088.10</b>		<b>6,701.86</b>	
<b>SOURCES OF FUNDS</b>					
<b>FIXED ASSETS</b>					
• Project Assets		934.42		841.78	
• Other Assets		24.30		30.67	
• Land and Building		404.39		411.40	
<b>INVESTMENTS</b>					
Corpus Investments		3,975.93		3,664.63	
Other Investments		1,512.71		1,628.38	

CURRENT ASSETS AND LIABILITIES				
Advances		15.45		22.78
Other Current Assets		13.45		13.18
Cash and Bank		209.43		90.69
<b>Gross Current Assets</b>		<b>238.33</b>		<b>126.65</b>
<b>Less: Current Liabilities</b>		<b>1.89</b>		<b>1.65</b>
<b>Net Current Assets</b>			<b>238.33</b>	<b>125.00</b>
<b>TOTAL</b>			<b>7,088.10</b>	<b>6,701.86</b>

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2015					(INR IN LACS )	
PARTICULARS		31st March 2015		31st March 2014		
<b>INCOME</b>						
Project income		1,473.95		1,407.13		
Interest Income		34.86		35.43		
Other Income		5.58		4.16		
<b>TOTAL</b>		<b>1,514.39</b>		<b>1,446.72</b>		
<b>EXPENDITURE</b>						
Staff Cost and Welfare		835.50		721.62		
Travel		156.97		121.38		
Operating and Program Expenses		520.13		600.52		
Depreciation		18.10		17.57		
<b>TOTAL</b>		<b>1,514.39</b>		<b>1,446.72</b>		
<b>Surplus/Deficit</b>			<b>(16.31)</b>		<b>(14.37)</b>	



RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2015					(INR IN LACS )
PARTICULARS		31st March 2015		31st March 2014	
<b>RECEIPTS</b>					
<b>Opening Balances</b>					
(Cash & Cash equivalents)		5,383.71		4,887.06	
Project Grants		1,122.99		1,059.47	
Corpus/Endowments		237.86		542.31	
Interest and other income		516.79		449.01	
<b>TOTAL</b>		<b>7,261.35</b>		<b>6,937.85</b>	
<b>PAYMENTS</b>					
Fixed Assets		111.81		84.06	
Staff Cost and Welfare	836.51		738.78		
Travel	152.57		132.40		
Operating and Program Expenses	503.96	1,493.04	598.92	1,470.10	
<b>Closing Balances</b>					
(Cash & Cash equivalents)		5,656.50		5,383.70	
<b>TOTAL</b>		<b>7,261.35</b>		<b>6,937.86</b>	

ATREE is recognized 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

##### BANGALORE (MAIN)

Royal Enclave  
Srirampura, Jakkur Post  
Bangalore 560064, Karnataka  
Tel: +91-80-23635555 (EPABX)  
Fax: +91-80-23530070

##### ATREE REGIONAL OFFICE

**EASTERN HIMALAYAS**  
Khangsar House  
Above Brahmakumari Building  
Development Area  
Gangtok 737101, Sikkim  
Tel/Fax: +91-3592-206403

##### NEW DELHI (LIAISON AND DEVELOPMENT)

C-86, 2nd floor, B K Dutt Colony  
New Delhi 110003  
Tel: +91-11-24603134

##### ATREE COMMUNITY BASED CONSERVATION CENTRES (CCC) AND FIELD ACADEMIES

##### BILIGIRI CCC

BR Hills, Chamrajanagara District  
Karnataka 571441  
Contact person:  
**Sidappa Setty**  
**C. Madegowda**  
Tel: +91-82262-44076

##### AGASTHYAMALAI CCC

Agasthyamalai, Community-based  
Conservation Centre (ACCC)  
3/199D, Mukkavar  
Manimutharu Main Road  
Manimutharu, Ambasamudram  
Tirunelveli 627421, Tamil Nadu  
Contact person:  
**M. Mathivanan**  
Tel: +91-4634-291809, 293387  
Mob: +91-94880-63750, 90251-32414

##### MM HILLS CCC

Keeranholi Village, MM Hills Post  
Kollegal Taluk, Chamrajanagara  
District, Karnataka 571490  
Contact person:  
**Harisha**  
Mob: +91-99863-48919

##### KANAKPURA CCC

Doddamaralwadi, Kanakapura Taluk  
Ramanagara District  
Karnataka 562121  
Contact person:  
**Kavitha A**  
Tel: +91-80-23635555 Ext: 106

##### VEMBANAD COMMUNITY ENVIRONMENTAL RESOURCE CENTRE

Ammankovil Street, Mullackal  
Alapuzha 688001, Kerala  
Contact person:  
**T D Jojo**  
Tel: +91-477-2251818  
Mob: +91-94470-73308

#### PROJECT OFFICES

##### ASSAM PROJECT OFFICE

House no. 19, Bhagadutta Path  
Outal, Mother Teresa Road  
Zoo Narengi, Gitanagar  
Guwahati 781021  
Mob: +91-98540-37084

17/B Cooch Behar Road  
Above Himalayan Nursery School  
Darjeeling 734101, West Bengal  
Tel/Fax: +91-354-2252177

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