



ANNUAL REPORT
2020-21



AWARDS AND RECOGNITIONS

ATREE was ranked #14 among Water Security Think Tanks and #20 among Environment Policy Think Tanks in the world in the University of Pennsylvania's Global Go To Think Tank Index Report 2020.

ATREE's Weeds to Wealth project was awarded the IF SOCIAL IMPACT PRIZE 2020.

ATREE enters its 25th year of interdisciplinary research focused on policy-oriented research, outreach, and education in the field of environmental conservation and sustainable Development. Rohini Nilekani, noted philanthropist and author, has pledged ₹50 crores (\$6.8 million) to ATREE, ₹25 crores (USD 3.4 Million) is a direct grant, ₹25 crores are matching funds for new grants ATREE raises from other sources. We are immensely grateful for the generosity of Rohini Nilekani.

“

Now more than ever, we require institutions that serve as an important bridge between academics, civil society and policymakers, bringing insights from long term research and data to support relevant decision making and shaping public discourse.

Rohini Nilekani

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ABOUT ATREE

Ashoka Trust for Research in Ecology and the Environment (ATREE) is a research institution in the areas of biodiversity conservation and sustainable development. We focus on applied science through research, education, and action that influence policy and practice on conservation of nature, management of natural resources, and sustainable development. ATREE is recognised as a Scientific and Industrial Research Organisation by the Ministry of Science and Technology, Government of India.

OUR MISSION

To generate rigorous interdisciplinary knowledge for achieving environmental conservation and sustainable development in a socially just manner, to enable the use of this knowledge by policy makers and society, and to train the next generation of scholars and leaders.



Bengaluru (Head Office)
Royal Enclave, Srirampura, Jakkur Post
Bengaluru 560 064, Karnataka, India.
Ph: +91 80 23635555,
info@atree.org | www.atree.org



SUSTAINING AND AUGMENTING OUR NATURAL ASSETS

We have known for quite some time that our major environmental problems are interlinked. Loss of biodiversity, climate change, unsustainable agricultural systems, degradation of soils, land, and water, and the emergence of many infectious diseases have something in common: humanity's ever-increasing incursions into the natural world. However, it is only recently we have come to fully realise that the common origin of these problems also points towards shared, nature-based, solutions such as the the restoration and sustainable use of natural assets to counter biodiversity loss, mitigate climate change, and repair degraded lands and ecosystem services.

ATREE is playing a pivotal role in two national initiatives in the application of nature-based solutions to address our pressing environmental challenges.

One is the National Mission on Biodiversity and Human Wellbeing. The Biodiversity Collaborative, an informal alliance of leading academic and civil society organizations, assembled by ATREE, is working with the Office of the Principal Scientific Adviser to the Government of India and the National Biodiversity Authority to develop and implement a national program on conservation management, and sustainable use of our natural assets to help realize the United Nation's Sustainable Development Goals.

Another large-scale initiative, Alliance for Reversing Ecosystem Service Threats (AREST) is focused on restoration of degraded lands across socio-ecological systems in peninsular India for societal and environmental benefits. Restoration, especially in other parts of India, is also a critical part of the Mission.

The two initiatives described in this report are also designed to enable our country to meet its international obligations under the Paris Agreement for climate change, Convention on Biological Diversity and other international conventions and treaties.

Certainly, as ATREE enters its 25th year of its establishment, it is coming of age as also indicated by other programs in this report. Our achievements are made possible by the unflinching support of our donors, especially, Rohini Nilekani, the Shibulal Family, SMS Foundation, Sandeep Singhal, Devdutt Yellurkur, Aroon Raman, Chitra Phadnis and Vasu Rao, Anthony Killough, and Chris Davidson among others. We are also most grateful to our many friends for their support.

**Dr. Kamaljit S Bawa,
Founder & President, ATREE**



ATREE enters the 25th year of its existence in a very challenging environment. The Covid-19 pandemic has highlighted the clear and ever-present danger of zoonotic disease, a threat that may only become more pronounced as environmental degradation proceeds unchecked. Ecological damage appears an almost inevitable corollary of economic development. The crises anticipated by climate change models appear not only inevitable but imminent. In this scenario, the work at ATREE assumes special importance, with much of the research directed towards sustainability and conservation science.

ATREE's Academy seeks to train the next generation of researchers, who will hopefully provide the inputs that will guide public policy for sustainable development in the future. ATREE's policy centres and regional centres offer a unique environment, in which the results of academic activity can be translated into action on the ground in areas like restoration and water management.

ATREE is uniquely positioned in its 25th year to embark on a new phase of expansion and consolidation, supported by generous and committed donors with a deep interest in ecology and the environment.

Prof. Balaram, Co-chair, ATREE



As we sail through the second wave of a stronger Coronavirus, our belief is even stronger that today or tomorrow, a development path which destroys the environment will be to our own detriment. With that in mind, the ATREE team paid respects to those who lost family members while doing their best to keep safe against the scourge. We adjusted to the reduced mobility, while still producing tremendous outputs largely from our home offices.

As we head into our 25th year, we find ourselves at the very intersection of managing our approaches toward conservation, restoration and development. We look forward to an reinvigorated future.

Dr Nitin Pandit, Director, ATREE

BOARD OF TRUSTEES



Dr. Kamaljit S Bawa,
Distinguished Prof. of Biology at the
University of Massachusetts Boston,
Founder & President, ATREE



Prof. Balaram,
Former Director, Indian Institute
of Science, Bangalore



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Dr. R Uma Shaanker,
Prof. Department of Crop Physiology and School
of Ecology and Conservation, University of
Agricultural Sciences



Ms. Rohini Nilekani,
Chairperson, Arghyam Foundation,
Co founder & Director, EkStep



Mr. Sandeep Singhal,
Co-founder and Managing
Director, WestBridge Capital

ENDOWMENTS AND RESEARCH GRANTS

ENDOWMENT DONORS

1. Rohini Nilekani, India
2. The Ford Foundation, USA
3. S.D. Shibulal and Kumari Shibulal, India
4. ATREE Belmont, USA
5. Sehgal Family Foundation, India
6. Bawa Family, Belmont, USA
7. Sarojini Damodaran Foundation, India
8. Raj Khoshoo and Mohini Khoshoo, USA
9. SDTT-ATREE CF (Tata Trusts), India
10. Oak Foundation, Switzerland
11. CISED, India
12. Barr Foundation, USA
13. Rani Dalbir Chaudhary, India
14. Vasudeva Rao and Chitra Phadnis, India
15. Arghyam Foundation, India
16. Kasturi Trust, India
17. Jayshree and Ganesan Balachander, India
18. T. R. Narayanaswamy and Meena Narayanaswamy, India
19. Govt. of Karnataka (Abdul Kalam Award), India
20. TVS Motor Company, India

RESEARCH GRANTS - CONT/ RUNNING GRANTS

1. National Geographic Society, USA
2. Antrix Corporation, India
3. Institute of Bioresources and Sustainable Development, India
4. Advanced Centre for Integrated Water Resources Management, Govt. of Karnataka
5. Office of the Principal Scientific Advisor to the Govt. of India (National Biodiversity Mission),
6. Ministry of Environment, Forest and Climate Change, Govt. of India
7. National Mission on Himalayan Studies, India
8. Charities Aid Foundation (Oracle CSR), India
9. Critical Ecosystem Partnership Fund, USA
10. Tides Foundation, USA
11. SayTrees Foundation, India
12. Norwegian Agency for Exchange Cooperation, Norway
13. Tata Trusts, India
14. Department of Science and Technology, Govt. of India
15. NortonLifeLock India (Symantec Software India), India
16. Utrecht University, Netherlands
17. The National Academy of Sciences, USA
18. The James Hutton Institute, Scotland, UK
19. Sundaram Finance, India
20. Brakes India, India
21. Aroon Raman, India
22. Ministry of Earth Sciences, Govt. of India
23. University of Kassel, Germany
24. Rufford Small Grants Foundation, UK
25. Department of Biotechnology, Govt. of India
26. Wellcome Trust – DBT India Alliance, India
27. National Medicinal Plants Board, India

28. Pel Drukpa Charitable Trust, India
29. United Nations Educational, Scientific and Cultural Organisation, India
30. University of Washington, USA
31. International Foundation for Science, Sweden
32. Azim Premji Philanthropic Initiatives (APPI), India
33. University of Stockholm, Sweden
34. Bharat Rural Livelihoods Foundation, India
35. Defries Bajpai Foundation, USA
36. Swissnex, India
37. United Nations Development Programme, India
38. Hanns Seidel Stiftung, Germany
39. Alliance of Religions and Conservation, UK
40. Bat Conservation International, USA
41. World Wild Fund for Nature, India
42. Cranfield University, UK
43. Zoological Society of London, UK
44. Centre for Ecology and Hydrology, UK
45. National Bank for Agriculture and Rural Development, India
46. Indira Gandhi National Forest Academy, India
47. Norwegian University of Life Sciences, Norway
48. London School of Hygiene and Tropical Medicine, UK
49. Science & Engineering Research Board, DST, Govt. of India
50. Chris Davidson, USA
51. Bengaluru Sustainability Forum, India
52. Anthony Killough, USA

NEW DONORS - YEAR 2020-21

1. Devdutt Yellurkar, USA
2. EdelGive Foundation, India
3. David and Lucile Packard Foundation, USA
4. HCL Foundation, India
5. Indian Council of Forestry Research and Education, India
6. American Jewish World Service, USA
7. International Centre for Clean Water (Akamai CSR), India
8. SVP Philanthropy Foundation, India
9. Oriental Bird Club, UK
10. G.B. Pant National Institute of Himalayan Environment, India
11. SDSN Association, USA
12. Oxfam, India



ACADEMY FOR CONSERVATION SCIENCE AND SUSTAINABILITY STUDIES

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In my ringside view, ATREE is essentially a multi-disciplinary knowledge institution but working at the cutting edge of the interface between knowledge building and society. This makes ATREE a very unique institution in the environmental space combining the highest characteristics of academia committed to critical social action.

Darshan Shanker

NOTE ON THE COVID-19 RESPONSE

Over the last year and a half, the coronavirus pandemic has had far-reaching personal and professional impacts. The Academy swiftly moved to teaching ongoing courses on digital platforms by the first week of April 2020. Additionally, a new 2-credit course was designed during the lockdown. During this period, Nachiket Kelkar, Ovee Thorat, Ronita Mukherjee, and Soumyajit Bhar defended their theses online and were subsequently awarded their PhD degrees. Yes challenges remain - in addition to a few devastating personal losses and health challenges, a number of students have been unable to collect field data vital to their doctoral research during the pandemic.

ACADEMY HIGHLIGHTS

4

Students registered with MAHE

18

Student publications

8

Popular articles published by students

5

Students received awards/grants

55

Seminars/workshops attended/presented in



BECOMING AN EMOTIONALLY INTELLIGENT RESEARCHER

The Academy organized a two-day virtual workshop titled Becoming an Emotionally Intelligent Researcher anchored by Dr. Shamim Modi. This is the second time that the Academy is conducting this workshop. The 2-day workshop was pedagogically based on learning about personal and social competencies through experiential exercises and discussing its relevance in various research situations.



LOGFRAME ANALYSIS AND ACTIVITY BASED COSTING WORKSHOP

The Academy organized a one day online workshop for students on Logframe Analysis (for project proposals and grants) and Activity Based Costing on 15th May, 2020. This was anchored by senior personnel from the Development Office and administration Dr. Sarala Khaling and Dr. Nitin Pandit.



SEMINAR ON HIMALAYAN SUSTAINABLE DEVELOPMENT AND CONSERVATION

The Academy conducted the second part of the seminar on Himalayan Sustainable Development and Conservation for Naropa Fellowship Ladakh virtually on 30th and 31st July, 2020 for its second batch of fellows. The seminar exposed the importance of documenting natural history and using this knowledge for eco-tourism and the importance of human well-being.



STUDENT ANNUAL SEMINAR (SAS)

The Academy organized its third overall and its first virtual Student Annual Seminar (SAS) from 6th–8th January, 2021. The SAS is designed to provide students a platform to present the progress on their doctoral research objectives to all ATREE faculty and their peers. 28 students presented their work in the SAS 2021.

OUR COMMUNITY CONSERVATION CENTRES (CCC)

ATREE has Community-based Conservation Centres (CCC) to produce research pertinent to and usable by local communities and to provide a space for local communities to engage with us. Our Regional Initiatives work closely with local communities to generate knowledge and contribute solutions that are pertinent to and usable by them. We have four working CCCs:

- Agasthyamalai: Kalakad-Mundanthurai Tiger Reserve (KMTR)
- Biligiri Rangaswamy Temple Tiger Reserve (BR Hills)
- Vembanad Community Environmental Resource Centre (CERC)
- Male Mahadeshwara Hills (MM Hills)



ATREE is a unique organisation that combines a quarter century of experience with a multidisciplinary skillset that is ideally suited to solve some of the most important and challenging problems of the planet.

Mr. Rahul Matthan

AGASTHYAMALAI COMMUNITY CONSERVATION CENTRE



VIRTUAL WILD EDUCATION PROGRAMME

Due to the pandemic, we organised the programme virtually. The four-month long Virtual Wild education programme was launched in August 2020 for 11-15 year olds from the southern districts of Tamil Nadu. It provides a unified nature learning platform enabling hands-on projects and two-way interactions. Thirteen topics with hands-on activities were covered in four months.

PANDEMIC IMPACTS ON LIVELIHOODS

Agriculture and Pastoralism are the two major livelihoods in the region. The pastoralists move their native sheep and cattle through the districts in search of better pasture. The lockdown occurred while they were on the move. We assessed the impact of the pandemic through direct interviews in Tirunelveli, Tenkasi, Thoothukudi, Virudhunagar, and Madurai districts. Key findings from the surveys are:

1. **Impact on meat market** - Meat shop owners bought the animals at a lower price from the shepherds.
2. **Impact on exports** - Meat and dung supply to Kerala was impacted.
3. **Rotational shepherding** - Lockdown affected the movement of pastoralists that work on a rotational basis.
4. **Infrastructure** - Lack of transportation and market shutdown resulted in lack in sales of paddy, banana, millets, and vegetables. could not be sold.



NEW HOME FOR BATS

Our long term monitoring of bats in temples in the southern districts of Tamil Nadu has shown that their population has been declining year by year due to human disturbance. Temples are bat-proofed using nets to prevent bat colonization. ACCC has started a program to construct bat houses, as in countries like Thailand.

A model bat house has been set up in ACCC campus at Manimuthar to see if bats take to such structures. The wooden bat house is 5' tall, 7.5' in breadth and 10' high and erected on cement poles 10' above the ground. This could secure a habitat for bats and the ecosystem services they provide.

ENABLING ECOFRIENDLY COFFEE FARMING IN WILDLIFE HABITAT WHILE IMPROVING LIVELIHOODS



651 Soligas grow coffee in BR Hills. Baseline survey was conducted with 76 farmers in 2020. Results indicated that average landholding is 1.95 acre, 87% of the farmers in BRT cultivate coffee. The study indicated that farmers require training on composting, pest and disease control, yield enhancement, pre and post-harvest techniques, marketing, and soil and conservation.



In 2020 seven webinars and six village level trainings were organised, 337 coffee farmers participated. With the help of Rainforest Alliance, we have trained 17 lead farmers who have spent 107 days with 451 coffee growing farmers to provide training on good agricultural practices.



The coffee beans were assessed to be of fair- average quality with potential to get organic certification although they reported a moisture content of 14%. FBO has been constituted, facilitating the sale of 149 tons of coffee at the rate of Rs.190 per kg in 2021, amounting to Rs. 84,097 per household.

BILIGIRI RANGASWAMY TEMPLE TIGER RESERVE, (BR HILL)





VEMBANAD COMMUNITY ENVIRONMENTAL RESOURCE CENTRE (CERC)

RESOURCE MAPPING AND SITE IDENTIFICATION OF POTENTIAL CLAM RELAYING ZONES AND FISH SANCTUARIES

Black clam (*Villorita cyprinoides*) is an important fishery resource for the traditional fishing community in the Vembanad Lake. ATREE CERC is involved with clam conservation since 2013 and is coordinating governmental efforts for clam relaying -introduction of baby clams- to enhance production in areas of poor clam production. ATREE CERC has conducted a resource mapping exercise to identify the potential sites for clam relaying and mangrove afforestation in Vembanad (Alappuzha) and Ashtamudy (Kollam) estuaries.

ONLINE CONSULTATION ON IMPACT OF COVID ON BACKWATER TOURISM IN VEMBANAD

An online consultation meeting was organized to discuss the livelihood crisis in the tourism and houseboat industry due to the Covid 19 lockdown and the measures to revive the sector. Representatives of tourism industry, houseboat owners, and policy experts participated.

AWARENESS ON ETHICAL FISHING PRACTICES IN VEMBANAD AND ASHTAMUDI

Communication Education and Public Awareness is an important step to ensure wetland conservation. Along with the fisheries department, ATREE CERC has organized widespread awareness classes for the traditional stakeholders in Vembanad and Ashtamudi. bring awareness about the ecological significance of the wetlands and motivate them not to indulge in illegal fishing practices.

TUBER CROPS TO ENSURE FOOD SECURITY DURING PANDEMIC AND LOCKDOWN

Tuber crops used to be common in household diets and were known for their nutritional value. They need less management, are better suited for climate, have a good shelf life, and have scope for value addition. To ensure food security during the pandemic and lockdown crisis, traditional tuber crops like yam, dioscorea, and Colocasia were promoted to the homesteads and to the available fallow land in Muhamma village.



VOCAL TO LOCAL: INDIGENOUS DIETARY PRACTICES AND DIVERSITY OF WFP

The voice of indigenous food systems on locally available wild food plants (WFP) and consumption is important to sustain interrelated food problems of malnutrition and disease. The study used Community perceptions to assess importance of WFP use among the forest-dwelling communities and interrelations with human well-being in eight villages.

The taxonomical distribution and diversity of 126 species were assessed. ~28 species of leafy vegetables are used by 80-100% of households for more than 20 days a year. The communities also use 120 wild edible herbs and root species as medicine. The study would help to evaluate the potential of WFPs use as future food in indigenous dietary systems and therapeutic practices.

INVASIVE SPECIES MANAGEMENT: LIVELIHOOD AND HARVEST IMPACTS

We have adopted a novel approach that uses Lantana, a hostile invasive plant, for making crafts. For this we trained 350 people of Soliga indigenous community and established decentralised Lantana Craft Centers (LCC) in MM Hills. In 15 years around 350 artisans have produced more than 80 varieties of lantana crafts including life-size elephant sculptures, and earned Rs. 1.2 crores.

In MM Hills, we have estimated lantana biomass between 30-50 tons per hectare. An analysis was done to understand the effect of Lantana harvest with respect to distance from the villages. We found that elevation had a positive impact on Lantana density, and artisans played a significant role in reducing Lantana density around 2 kms radius of their villages.



NORTH EAST INITIATIVE

ATREE's Eastern Himalayas (EH) aims to develop multi-functional landscapes in Northeast India that protects biodiversity, maintains ecosystem with integrity and promotes the well-being of its people. ATREE's interventions in the Eastern Himalayas target strategies for development that foster biodiversity conservation and human well-being. This initiative establishes economically and socially empowered local communities, resilient institutions, and human resources to meet the environmental challenges.



NATIONAL MISSION ON HIMALAYAN STUDIES

The project is supported by the Ministry of Environment, Forest and Climate Change through G.B. Pant Institute of Himalayan Environment and Sustainable Development as part of the National Mission on Himalayan Studies.



HIGH CONSERVATION VALUE AREAS

Identifying, assessing, delineating and mapping areas with High Conservation Values (HCV) and developing management recommendations/ plans for them in SECURE Himalaya project landscapes in North and West districts of Sikkim



SUSTAINABLE AND HEALTHY FOOD SYSTEM

The study is a part of an on-going Sustainable and Healthy Food system (SHEFS) project. The objective of this study is to understand the changes in the local food systems in Sikkim by undertaking this pilot research in Dzongu Valley of North Sikkim.



FOOD FUTURES

In an ongoing effort to address the issue of loss of traditional food crops and the change in food habits and dietary habits which has further perpetuated the loss of agro-biodiversity in the region, ATREE is making efforts to pilot an initiative of linking local, endemic and seasonal food with tourism in Darjeeling Hills.

CENTRE FOR ENVIRONMENT
AND DEVELOPMENT (CED)





ENABLING INTEGRATED WATER RESOURCES MANAGEMENT IN KARNATAKA

India has more than 18% of the world population but only 4% of the world's renewable water resources with 2.4% of the world's land area. Integrated Water Resources Management (IWRM) has emerged during the last decade as our freshwater resources are being placed under pressure from population growth and rising demand for water, as well as increasing pollution levels. Two week residential Management Development Programmes have been organised by ATREE for entry-level and mid-career water engineers in the Karnataka State Water Resources Department. These training programmes have been organized with the support from Advanced Centre for Integrated Water Resources Management.

ANALYZING THE TRANSFORMATIVE POTENTIAL OF CFR RIGHTS

This project aims to study whether and under what conditions Community Forest Resource (CFR) management provision of the Forest Rights Act, 2006 can realize its transformative potential, i.e., enhance livelihoods equitably, empower communities and conserve/regenerate forests. The study is being conducted in 6 villages in eastern Maharashtra working in partnership with civil society organizations (CSOs) that have supported these villages. By evaluating multi-dimensional outcomes in villages with several years of CFR management, this study hopes to make a distinctive contribution in terms of both estimating the potential and identifying challenges and required support policies for successful CFR management.



Atul Joshi and Shruti Mokashi with the staff of partner CSO in the CFR area of a village in Yavatmal district, Maharashtra.



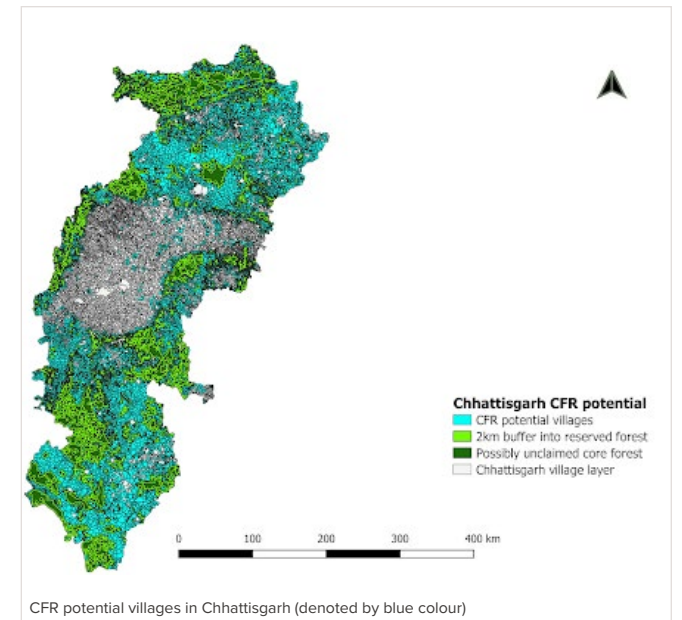
Sharachchandra Lele meeting community representatives at Khairkheda Village, Kanker District, Chhattisgarh

ESTIMATING AND MAPPING CFR POTENTIAL

A study to determine how much forest land might be eligible for Community Forest Resource (CFR) rights claims under the Forest Rights Act, 2006. The study used a combination of Census of India data and maps, and Geographic Information System (GIS) techniques to estimate (a lower bound for) the potential area that could come under CFR rights in four important central Indian states. In these states, ~60,000 villages could potentially claim CFR rights over an area of at least ~1,83,000 km². A [report](#) detailing the results of this study was published. WebGIS [portal](#) is being developed to publicly display the results.

COMMUNITY FOREST RESOURCE RIGHTS IMPLEMENTATION IN CHHATTISGARH

This study, supported by Oxfam India, sought to understand the nature of community forest resource (CFR) rights and the land titles that were recognized in Chhattisgarh in two broad phases (pre-2019 and since 2019). It highlighted the limitations of the rights recognized in the first phase, and made recommendations to strengthen the process in the ongoing second phase of CFR implementation. Discussions have now begun with the Bastar district administration for building capacities of the district bureaucracy as well as village community representatives in CFR rights recognition and CFR management planning.





SUSTAINABLE USE OF NATURAL RESOURCES TO IMPROVE HUMAN HEALTH AND SUPPORT ECONOMIC DEVELOPMENT (SUNRISE)

SUNRISE project funded by NERC broadly supports the realisation of the SDGs by improving livelihoods and wellbeing. ATREE is collaborating with UK Centre for Ecology & Hydrology (UKCEH) to monitor water quality and ecological health, evaluate benefits and implement decentralised solutions to rejuvenate the lakes. Lakes are highly valued by urban communities for multiple benefits. However, they are highly vulnerable to pollution from wastewater and urban run-off, especially in rapidly growing cities where wastewater treatment infrastructure does not keep pace with the growth of the city. UKCEH and ATREE are working on a case-study in Bangalore, India, to highlight the multiple benefits of restoring urban lakes.



ENTERPRISE BASED CONSERVATION MODEL AND SUSTAINABILITY; LESSONS LEARNT

Our studies indicated that tenure plays an important role in bringing community participation in conservation, sustainable use of forest resources and helps to establish sustainable business models. Forest Rights Act (FRA) of 2006 was used to empower forest dependent communities with rights to access forests. Our work facilitated the provisioning of forest rights to 77 Gram Sabhas that includes 83 villages, 5433 families with 21,732 members. ATREE implemented decentralized enterprise-based conservation models with respect to NTFPs and agricultural products that led to an income generation of Rs. 5.4 Lakhs to tribal community during 1997-2000. Later, three decentralized processing units were established in 2017 with an annual turnover of 10 Lakhs.



VALUE CHAIN OF GUM-RESIN FROM BOSWELLIA SERRATA IN TEMPLE MARKETS OF THE WESTERN GHATS

Pilgrims travel from all over India to visit several popular temples across various protected areas of the Western Ghats. Pilgrims of all three centers offer gum-resin from *Boswellia serrata* to the deities. The powdered gum-resin (locally called dhoopa), sold in the temple markets of three selected study sites in protected areas, is sprinkled on hot charcoal to emit aromatic incense. Focus group discussions with ~200 gum-resin harvesters and about 250 individual surveys with the value chain actors were conducted to identify the challenges and suggestions to the gum-resin market. Core consideration of this study relates to the re-establishment of a buying or marketing agency to provide a more significant and fairer share of the value to the local harvesters.

An aerial photograph of a deep, narrow valley. A wide, muddy-brown river flows through the center of the valley, winding slightly to the right. The valley walls are covered in dense, vibrant green forest. In the background, mountain ranges are visible, partially shrouded in white mist or low clouds. The overall scene is lush and scenic.

(SURI SEHGAL) CENTRE
FOR BIODIVERSITY AND
CONSERVATION (CBC)



BIO-RESOURCES AND SUSTAINABLE LIVELIHOOD IN NORTH EAST INDIA

Northeast India is rich in biodiversity that has huge economic value but are threatened by many factors associated with population growth, infrastructure development, ineffective policies and poor governance. The multi-institutional project coordinated by ATREE has three major components, a) documentation of biodiversity and its bioresource potential, b) integrative taxonomy of Lauraceae and c) strengthen human resources to address modern challenges of biodiversity and sustainability to document selected biodiversity. During this project, several species have been discovered, and a series of workshops and courses have been conducted. Communication products have been developed to involve the general public.



SAVING THE FISH FROM MEKONG TO MEGHALAYA

The objective of this project is to establish community-based Fish Conservation Zones (FCZs), define ecological flows and hydrological parameters and include it in the management of FCZs. Till date, one FCZ has been established with the approval and support of the community in each state wherein a stretch of the river is being protected by the community. Hydrological monitoring is underway in both sites with water level and rainfall being recorded. Community perceptions and river health assessments have also been conducted in these villages.

SOURCE-SINK DYNAMICS OF RABIES TRANSMISSION THROUGH WHOLE GENOME ANALYSIS

The project sampled 319 dogs between October 2017 and August 2018 in and around Pune. Composite brain tissues were subjected to Rapid Lateral Flow Assay test and 157 positive samples were selected for RNA extraction and genomic studies. We used high throughput DNA sequencing Illumina HiSeq platform to study evolution and mutations in rabies virus. This is the first whole genome-based phylogenetic and mutation analysis of rabies derived from dog specimens of Indian region. Like other RNA viruses, Lyssaviruses exhibited high rates of mutation due to a lack of proofreading activity in the L gene. Individual isolates generated from this study could be unambiguously assigned to the Arctic-like lineage which is estimated to have evolved between 1725–1815. Our study shows a sustained circulation of viral variants and speedy divergence that apparently contributes to the sustainment of the enzootic cycle of domestic rabies in Pune city.

INTEGRATING POLLINATORS INTO URBAN AGRICULTURE FOR HEALTHY AND LIVEABLE CITIES

It is estimated that pollinators account for ~40% of the global supply of nutrients. It is imperative to understand patterns of consumption of pollinator dependent crops in India. Bengaluru, with a representation of diverse socio-economic classes, cultural backgrounds and dietary habits, offers an ideal setting to estimate dependence on pollinator-mediated foods. An online survey assessed the extent of pollinator dependence and explored the scope, willingness and constraints for establishing pollinator-integrated edible gardens.

Pollinator-dependent foods make up 60% of the diet of Bangaloreans, 7% of food consumed is dependent on pollinators for seed production, and 3% is partially dependent on pollinators. A majority of respondents had home gardens. 32% of garden-owners grew vegetables and fruits. 80% of respondents without edible gardens expressed interest in growing their own food.



THE BANNI GRASSLANDS IN A TIME OF CHANGE: ECOLOGICAL AND SOCIOECONOMIC RESILIENCE IN A COUPLED HUMAN-NATURAL SYSTEM

Banni has a long history of nomadic pastoralism and is an important habitat for wildlife and migratory birds. *Prosopis juliflora* has altered the habitat for birds and animals and reduced grazing area for livestock. This project aims to understand the dynamics of the spread of *Prosopis*, understand the plant's ecological and socioeconomic impacts, and evaluate various management options.

An overview of camera trap data collected from 240 sampling points across the landscape shows differential influence of *Prosopis* on space use by meso-carnivore species. *Prosopis* has species-specific impacts on the rodent community, which is the principal prey of meso carnivores.

“

ATREE celebrates 25 years of significant contribution to the environmental sector. In this past year, ATREE has stepped up on many funds, including the CSEI, which will look at putting its decades of research and also new knowledge into more focused application through strategic partnerships with community and bazaar.

ATREE now has committed itself to having even more impact as environmental challenges become ever more complex and critical.

Rohini Nilekani

CENTRE FOR SOCIAL & ENVIRONMENTAL INNOVATION (CSEI)





Photo Courtesy: "Adventures in City Farming" by Siddhartha Sikdar, via Flickr

GREEN CITIES

Indian cities are faced with water shortages, polluted water bodies and overloaded landfills. Almost 70% of wastewater in India flows back into the ecosystem without being treated or reused. If this wastewater is treated properly, it can be reused to recharge aquifers and invest in greening projects.

The goal of the Green Cities Initiative is to increase freshwater availability to 6 million people and preserve 10,000 Ha of degraded land and water bodies by 2030.

The Green Cities Initiative is focused on building an innovation ecosystem that can restore and sustain the interconnected green, blue and grey infrastructure in cities, working with builders, architects and citizen groups.

FOOD FUTURES

50% of India's farmers have smallholder rainfed farms. Of the irrigated area, groundwater contributes over 70% of net irrigated area, but there is increasing concern that groundwater is being depleted. Incomes from agriculture are stagnating. The goal of the Food Futures Initiative is to boost water security and restore degraded land to improve 150,000 livelihoods in 2000 villages by 2030.

Simplistic approaches to expanding water availability often miss the "zero-sum" nature of the game. As the focus has shifted from building structures to demand management and water budgeting, the Initiative is co-creating digital and paper tools to help grassroots civil society organisations budget and plan for water better.



Photo courtesy: "Drought Affected Area in Karnataka" by Pushkarv, via Wikimedia Commons



Photo Courtesy: Soliga community members outside their home, Aparna Nambiar, CSEI

INVASIVES

Lantana camara is a highly invasive weed that has taken over 40% of Indian forests, displacing native species. Lantana reduces regeneration of native species, affecting movement and foraging by wildlife and increasing human-wildlife conflict. It also increases the risk of fire. It is, however, notoriously difficult and expensive to remove the weed and restore native vegetation.

The goal of the Invasives Initiative is to create livelihoods for 10,000 people through the removal of invasives and restoration of 500,00 hectares of land.

The approach is to "mine" Lantana turning it into a resource that pays for its removal while creating livelihoods via artisanal crafts and commodity products. To avoid unintended consequences, the Initiative emphasises careful institutional design as well as partnerships with restoration organisations.

CENTRE FOR POLICY DESIGN (CPD)



For the last two decades, ATREE has been engaged in generating rigorous interdisciplinary knowledge to inform policy and practice towards conservation and sustainability. Sustaining India's landscapes and ecosystem services while addressing chronic poverty and inequality, requires rigorous interdisciplinary knowledge about how these interconnected socio-environmental systems work; but we also need translation of the knowledge to spur implementation of innovative solutions.

Scaling transformative solutions will require innovative policy instruments, and improved governance at multiple levels. To achieve this, ATREE has set up a new Centre for Policy Design (CPD) that will work collaboratively with a range of stakeholders to tackle

ecological and developmental problems such as invasive species, climate change, water scarcity and access, water pollution and degraded land restoration. The Centre will focus on developing climate and ecosystems friendly solutions for achieving equitable development in India and south Asia.

The Centre will build new capabilities in regulatory, innovative financing, and institutional design at ATREE, as well as augment existing capabilities in capacity building, stakeholder-led environmental governance, data visualisation and story-telling, and decision-support systems. This includes (but is not limited to) cross-cutting issues related to the demand side, such as behavioural change, drivers of consumption and efficiency, and environmental governance.

OUR INITIATIVES

ALLIANCE FOR REVERSING ECOSYSTEM SERVICE THREATS (AREST)

The AREST partnership between the Columbia University, International Center for Agroforestry (ICRAF), Environmental Defense Fund (EDF), Foundation for Ecological Security (FES) and ATREE will implement ecosystem restoration across semi-arid and sub-humid zones of peninsular India. The alliance will collaborate on scientific evidence-based assessments of carbon sequestration potential and other co-benefits from restoration such as biodiversity conservation, hydrological security and rural employment. In the process, we will identify the most socio-ecologically responsible restoration interventions on four types of ecosystems. These are lands infested with invaded species

(mainly Lantana), open and natural habitats, riparian zones and degraded agricultural lands. We will also identify financial mechanisms and design policy recommendations to meet India's restoration targets. These are India's Nationally Determined Contributions (NDCs) under the Paris Agreement which includes a pledge for an additional carbon sink of 2.5-3 billion tonnes of CO₂ equivalent from forest and tree cover (known as NDC3) and restoration of 26 MHa of degraded land. The commitments, when systematically and scientifically planned contribute to India's other international pledges such as the Sustainable Development Goals (SDGs) and the Aichi Biodiversity Targets.

NATIONAL MISSION ON BIODIVERSITY AND HUMAN WELL-BEING (NMBHWB)

India's varied ecosystems, across land, rivers and oceans, feed our people, enhance public health security, and shield us from environmental disasters. While the precise economic value of all ecosystem services provided by biodiversity may not be known, estimates suggest our forests alone yield Rs 128 trillion per year. India's Ministry of Environment, Forest and Climate Change is planning to launch an ambitious National Mission on Biodiversity and Human Well-Being (NMBHWB). This Mission is one of the nine national missions approved by the Prime Minister's Science, Technology and Innovation Advisory Council in 2018.

The Mission will strengthen the science of restoring, conserving, and sustainably utilizing India's natural heritage; embed biodiversity as a key consideration in all developmental planning, particularly in agriculture, ecosystem services, health, bio-economy, and climate change mitigation; and establish a citizen and policy oriented biodiversity information system. The ongoing spread of COVID-19 places this Mission among the most significant national initiatives. This crisis has exposed the dysfunctional relationship between humanity and nature, and we must urgently address the issues it has laid bare, the Mission offers a comprehensive framework, integrated approaches, and widespread societal participation.

TN KHOSHOO MEMORIAL AWARD, 2020

The award is instituted by ATREE in the name of the late, great environmental science pioneer and former trustee, Dr Triloki Nath Khoshoo, to recognise individuals who have made marked contributions to the field of ecology and environment. Ms. Rohini Nilekani, trustee, ATREE, presented Licipriya Kangujam the award for having 'achieved monumental impact' while campaigning for climate change. Ms. Nilekani is the founder-chairperson of Arghyam Foundation and Rohini Nilekani Philanthropies.

The theme for this year's award ceremony was 'the Science and Art of Outreach for the Environment' - how communication can be approached through multiple avenues. Dr Nitin Pandit, Director, ATREE, in introducing this year's theme reflected on how the 'role of poetry, song and dance, storytelling, myth and other historical artefacts' and how such community based communications formed the essence of outreach in traditional scientific knowledge. He spoke about the need to scale scientific knowledge using new technologies in a manner that would inspire 'mass movements'.

The memorial lecture was delivered by Grammy Award winning musician and environmentalist Mr. Ricky Kej. In his address followed by a Q&A session, he stressed the importance of music and the arts in delivering impactful communication, and the need to constantly calibrate communication, in whatever form it is delivered, according to demographic and cultural specificities.



FINANCIAL STATEMENTS

(INR in Lacs)

Balance Sheet as at 31st March 2021				
Particulars	31st March 2021		31st March 2020	
	Source of Funds			
Corpus Fund		5,613		5,653
General Fund		96		96
Utilised Reserves				
Project Assets		1,438		1,404
Other Assets		35		34
Land and Building		893		905
Project Fund		1,710		1,037
Total		9,785		9,129
Application of Funds				
Fixed Assets				
Project Assets		1,438		1,404
Other Assets		35		34
Land and Buildings		893		905
Investments				
Corpus Investments		5,594		4,861
Other Investments		70		69
Current Assets and liabilities				
Advances	59		99	
Other Current Assets	67		54	
Cash and Bank	1,630		1,707	
Gross Current Assets	1,756		1,860	
Less: Other current Liabilities	1		4	
Net Current Assets		1,755		1,856
Total		9,785		9,129

Income & Expenditure Account for the year ended 31st March 2021		(INR in Lacs)	
Particulars	31st March 2021	31st March 2020	
Income			
Grants	2,099	1,725	
Interest	332	523	
Donation & other income	-	85	
Total	2,431	2,333	
Expenditure			
Centre for Environment and Development			
Forests & Governance	62	67	
Water, Land & Society	233	237	
Climate Change Mitigation & Development	91	103	
Suri Sehgal Centre for Biodiversity and Conservation			
Ecosystem Services and Human Wellbeing	301	355	
Biodiversity Monitoring & Conservation Planning	639	488	
Landscapes, Livelihoods & Conservation	262	305	
Centre for Social and Environmental Innovation			
Centre for Policy Design	15	8	
Academy for Conservation Science and Sustainability Studies			
Salaries-Programme Support	67	74	
Salaries/Consultancy-Institutional Support	383	379	
Staff Welfare	46	5	
Administrative Expenses	83	91	
Depreciation	25	21	
Total	2,445	2,345	
Surplus/(Deficit) during the year	(14)	(12)	

Receipts & Payments Account for the year ended 31st March 2021		(INR in Lacs)	
Particulars	31st March 2021	31st March 2020	
RECEIPTS			
Opening Balances			
(Cash & Cash equivalents)	6,637	6,287	
Receipts during the year			
Project Grants	2,448	1,888	
Corpus/Endowments	110	637	
Interest	447	483	
Donation and other income	32	85	
Total	9,674	9,380	
PAYMENTS			
Fixed Assets	48	301	
Centre for Environment and Development			
Forests & Governance	67	67	
Water, Land & Society	230	247	
Climate Change Mitigation & Development	106	105	
Suri Sehgal Centre for Biodiversity and Conservation			
Ecosystem Services and Human Wellbeing	295	336	
Biodiversity Monitoring & Conservation Planning	589	560	
Landscapes, Livelihoods & Conservation	265	328	
Centre for Social and Environmental Innovation			
Centre for Policy Design	15	8	
Academy for Conservation Science and Sustainability Studies			
Salaries-Programme Support	67	74	
Salaries/Consultancy-Institutional Support	383	380	
Staff Welfare	46	5	
Administrative Expenses	78	91	
Closing Balances			
(Cash & Cash equivalents)	7,247	6,666	
Total	9,674	9,380	



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THANK YOU FOR THE SUPPORT

The progress we've reported on was made possible by the generous support of donors and partners. Conserving biodiversity is a collaborative effort and human partnerships, as mirrored in the natural world, are the key. Thank you for backing us.