



July 2024 Edition

Hello,

Welcome to the newest edition of Branches, ATREE's quarterly newsletter. We are delighted to present the latest updates and insights from our wide range of projects. Discover the innovative methodologies and impactful findings that characterise our ongoing research. Join us on this journey through the branches of knowledge as we aim to create a meaningful difference in our environment and society.

## PROJECT

Community-driven Conservation and Sustainable Management of the Chakpi River Aquatic Resources in Manipur *by Nobin Raja and G. Ravikanth*



## BACKGROUND

The Chakpi River, flowing through Chandel district, Manipur, is a crucial lifeline for the local communities of Lambung, Monsang Pantha, Mantri Pantha and Japhou. Approximately 88.32% of Chandel's population resides in rural areas, depending heavily on the river's resources for their livelihoods. The Chakpi River originates from the Laimaton Cliff of

Tengnoupal Khunou and Shenam Hills at an elevation of 1,755 metres above sea level, primarily fed by natural springs and rainfall. However, climate change-induced alterations in rainfall patterns and increased pressures from a growing population threaten the river's sustainability. The Chakpi River, covering a total catchment area of about 660 square kilometres, plays a vital role in the agricultural and cultural life of Chandel district, fostering connections among the Tarao, Anal and Meitei tribes. Despite its importance, developmental interventions like the Chakpi Dam and hydroelectric projects have raised concerns due to the lack of informed consent from the local communities.

## PROBLEM

Overexploitation of the Chakpi River's resources, including illegal soil extraction and the use of harmful fishing practices such as chemicals and dynamite, has led to significant ecological degradation. Depleting fish stocks and other aquatic resources, coupled with declining water quality, pose a serious threat to the river ecosystem and the livelihoods of the local communities.

## OUTCOMES

1. Ban on chemical and dynamite fishing practices & sand mining
2. Regulation on the extraction of aquatic resources
3. The Chakpi River information centre for the local communities
4. Creation of a community conservation reserve
5. Training Local communities for monitoring resources
6. Providing alternate livelihood opportunities

## PROJECT

*Jal Jungle Jameen in Classrooms – A Digital Repository of K-12 Environment Education Resources - of, by and for the educators in India by Pallavi Varma-Patil, Madhushri Mudke and Ankit Agrawal*



## BACKGROUND

Since 2001, ATREE has been developing innovative K-12 Place-Based Education (PBE) programmes for natural resource conservation, benefitting 2400 teachers and 22,000 rural/urban children in key biodiversity hotspots across India. PBE prioritises experiential, interdisciplinary learning and stewardship of local natural resources. In doing so, it guides young learners to go beyond 'knowing about' nature to actively 'caring for' nature. The unfolding climate crisis and India's acute vulnerabilities to climate change provide a sense of urgency to scale up ATREE's PBE programmes. The project titled *Jal Jungle Jameen in Classrooms* aims to do so by leveraging digital technology to empower K-12 educators in India with PBE curricula and pedagogy inputs.

## PROBLEM

Place-Based Education (PBE) encourages educators to integrate student-led, contextual and relevant environment action into their teaching. Such experiential learning is a sharp departure from the dominant rote-learning approach of Environment Education (EE) at the school level in India. It also finds endorsement in India's new National Education Policy (NEP 2020). However, implementing PBE in schools has its own set of challenges, a crucial one being access to good quality curricular materials that reflect the social and ecological diversity of India. In the last decade or so, India has seen a variety of relevant environmental education resources published in multiple Indian languages by state and non-state actors. But they are not easily accessible – being scattered across different websites, publishers and organisations or lacking meaningful curation to support their use by educators in classrooms.

In this project, therefore, we centre our efforts on developing an open-access, peer-evaluated, curated digital repository of EE resources contextual to India. The repository is targeted for middle school, given the potential of this age group for high-impact change. The work-in-progress repository has a social media presence through an [Instagram page](#). To ensure a ground-up strategy in consolidating EE resources, the project also involves conducting thematic teachers' workshops focusing on the care and conservation of our commons and key natural resources, i.e. Water, Land and Forests (*Jal, Jungle, Jameen*).

## OUTCOMES

Our approach combines three aspects to **reimagine environment education** in times of climate change:

1. Build an **Action-Research framework** to explore the specific benefits and challenges of implementing PBE in India, hence supporting national policy recommendations with on-ground evidence
2. Develop the **digital repository** of relevant resources and pedagogic tools with significant inputs from educators
3. Build a **community** of caring and creative educators to collaborate,



share, discuss and brainstorm. For, we believe that any teaching-learning that has a direct impact on children's choices and actions cannot be an individual pursuit.

## PROJECT

Land tenure and forest governance in the southern Konkan region of Maharashtra in colonial and postcolonial periods *by Shalmali Sawant, Venkat Ramanujam, Madhura Niphadkar and Atul Joshi*



## BACKGROUND

The southern Konkan region of Maharashtra, a narrow, low-lying land strip along the western coast of Maharashtra, forms a unique mosaic of large tracts of forested land under private ownership, agricultural croplands, monoculture plantations and small scattered government forest reserves. The privately owned forested lands, with around 3000 sq. km area, adjoin the Western Ghats biodiversity hotspot. These forests harbour diverse floral and faunal assemblages and also act as crucial corridors for large mammals along with aiding the livelihood of landholders.

## PROBLEM

Private forest owners are typically more vulnerable to land use changes for immediate economic benefits. These forest lands are increasingly being converted to commercial monoculture plantations. Our study aims to understand the formation of these land-use mosaics by peeking into the past and exploring the colonial and post-colonial history (1800s–present) of the region to understand forest governance and land-use changes through archival sources. We referred to archival records at the Maharashtra State Archives in Mumbai to construct the land-use history of the study region.

## OUTCOMES

Our study finds that the Southern Konkan was an important centre for shipbuilding during the Maratha rule in the 18th century with well-

maintained teak (*Tectona grandis*) reserves. After the British takeover in 1818, these teak reserves were quickly utilised but other woodlands were largely left in the control of private landowners.

This was contrary to the British government's extensive acquisition of forests from other parts of India. The early British period saw large-scale clearance of forests with the establishment of shipbuilding industry along with the expansion of agriculture for revenue generation. The British government couldn't succeed in southern Konkan largely due to the influence of local landlords, administrative difficulties associated with topography and poor potential revenue generation. The high dependence of agricultural activities on forest produce also played a key role in retaining private rights over these forests. The economic potential of horticulture, favourable topography and the land tenure system seem to have resulted in increasing forest conversion for horticulture in the region.

## PROJECT

A blue ant from the deep woods of Siang Valley by *Sahanashree R. and Priyadarsanan Dharma Rajan*



## BACKGROUND

While exploring a tree hole about 10 feet above in a steep cattle track in the remote Yinku village of Siang Valley in Arunachal Pradesh, something sparkled in the twilight. In the dim light available, two insects were sucked into an aspirator by the researchers. In contrast to the common red, black or brown ants, it was a stunning blue ant. This new species was identified as belonging to the rare genus *Paraparatrechina* and was named *Paraparatrechina neela*. The specific epithet *neela* means blue in most Indian languages.

## APPROACH

Nestled within the Himalayan biodiversity hotspot, Arunachal Pradesh's Siang Valley is a world of unparalleled wealth and diversity. Its misty forests and towering mountains are a treasure trove of biodiversity. Much of it is yet to be explored. This ant was collected during an expedition to the Siang Valley to resurvey its biodiversity after the century-old 'Abor expedition'. Accompanying a military expedition, a group of British colonial scientists set out in 1911 to document the natural history and geography of the valley, and they called it the 'Abor expedition'. This expedition managed to explore and map large parts of the Siang Valley region and catalogued every plant, frog, lizard, fish, bird, mammal and insect they found. Their discoveries were published in several volumes from 1912 to 1922 in the *records of the Indian Museum*.

Now, a century later, a team of researchers from ATREE and a documentation team from Felis Creations Bangalore have embarked on a series of expeditions under the banner 'Siang Expedition' to resurvey and document the region's biodiversity. This expedition is funded by the National Geographic Society through the Wild Life Conservation Expedition Grant. The previous expedition was during winter, and the diversity of insects collected was very low. To compensate for this, we planned multiple expeditions in different seasons and used multiple methods to collect a broad diversity of insect groups. As part of the collection exercise, dung-baited pitfall traps and open dung baits were used for dung beetles, pitfall traps, a Winkler extractor and aspirators were used for ants, and yellow pan traps, malaise traps, and sweep netting for parasitic wasps.

## OUTCOMES

In this expedition, the ATREE entomologist's team including Sahanashree R., Ranjith A. P., Seena N. Karimbumkara and Priyadarsanan Dharma Rajan discovered a new subfamily, six new genera, and more than 40 new species belonging to ants, dung beetles, bees and parasitic wasps. Among these, *Paraparatrechina neela* stands out for its distinctive metallic-blue colouration. This discovery marks the first documented occurrence of the genus in Arunachal Pradesh and represents the first addition to the *Paraparatrechina* genus in the Indian subcontinent in 121 years. Notably, *Paraparatrechina aseta* was the only previously known species from the Indian subcontinent.

The remarkable discovery of the blue ant received extensive **worldwide media coverage**, ranking among the top 5% of research outputs, according to Altmetric. It was featured in over **63 news outlets and 3 blogs, including prestigious platforms like Nature, The Independent, EurekAlert, Science Daily, and Forbes. In India, the discovery was covered by leading news organisations such as The Hindu, Deccan Herald, NDTV, and News 18, as well as in 10 different languages, including Kannada, Malayalam, French, Spanish and Italian.** This



widespread attention highlights the discovery's substantial impact and global interest.

## PROJECT

Engaging Stakeholders to secure the future of Kannamangala Lake by  
*Dr Seshadri K. S. and Shree Varsha*



## BACKGROUND

Lakes in Bengaluru are vital oases of biodiversity and ecosystem services. Historically, these lakes were irrigation tanks constructed across waterways and hold significant socio-ecological importance. However, with urbanisation, these tanks have transformed into lakes, becoming reservoirs of sewage and stormwater. Their management has also become uniform, with raised bunds, walking tracks and planted trees around them. Consequently, people's associations with these lakes have transformed significantly.

## PROBLEM

The lakes are now fenced to prevent encroachment, creating barriers for historical lake users like - cattle herders and fishermen. This leads to the alienation of stakeholders from the lake. Research shows that key decisions about lake management are often not inclusive, with a few people making decisions for the majority. Excluding people from the decision-making process can alter their perception of a lake and its significance. As a result, the lake fades from people's minds, leading to apathy when its existence is threatened.

## APPROACH

Our approach to this challenge is to address the alienation by encouraging stakeholders to appreciate the multifaceted nature of the lake. With support from Tata Elxsi, ATREE is engaged in the restoration of Kannamangala Lake in eastern Bengaluru. We are conducting a series of stakeholder engagement activities to help people experience the lake through thematic guided walks, facilitated by a researcher and nature educator. Our objectives

are to facilitate learning and rekindle an appreciation for the lake. We hope these activities will rebuild a sense of ownership and community among the stakeholders.

## OUTCOMES

So far, we have conducted thematic walks where participants learn to appreciate trees by understanding their ecology, forest dynamics and seasonality. We have organised night walks to search for fireflies, helping people understand their role in the lake ecosystem and appreciate the darkness. Early morning bird walks have provided great learning experiences, inspiring many participants to take up birdwatching as a hobby. Most recently, we engaged people in clearing plastics from the lake and classifying them into different categories. Nearly 60 kilos of plastic were collected, sorted and transported to a local waste processing unit. By engaging stakeholders through these activities, we aim to foster a deeper connection with Kannamangala Lake and ensure its conservation for posterity.

## PROJECT

Diversity for Restoration *by K. S. Arpitha, Milind Bunyan and G. Ravikanth*



## BACKGROUND

Restoring degraded land is a major global challenge and concern. The United Nations Decade on Ecosystem Restoration has drawn political and scientific attention to the importance of land and ecosystem restoration. This has led to an upsurge in mass tree-planting programmes that lack socio-ecological perspectives. To address this issue, the Diversity for Restoration (D4R) tool was developed by 'The Alliance of Bioversity and CIAT' as an online decision support tool. D4R helps landowners and managers make tailored decisions on choosing the most appropriate species to plant and keeping an account of site-specific conditions, location and restoration goals at the forefront. The tool predicts suitable habitats of specific species under present and future



climatic conditions using data on plant traits and habitat suitability modelling. D4R provides nuanced recommendations and aims to maximise the prospects of restoration efforts. Currently, the tool contains information on 250 species from across the Western Ghats, including details on over 100 functional and physiological traits.

## PROBLEM

Despite the rising numbers of restoration-focused initiatives, many have failed or have had a low impact. These failures stem from poor inter- and intra-specific diversity, species-site mismatches and uncertainties surrounding land tenure. The selection of species and seed sourcing are commonly driven by the availability of plant material, mostly resulting in the selection of a few well-known species that are often exotic to the region. Choosing trees that are not the 'right' fit for the site can lead to increased mortality, ecological imbalance or a rise in monocultures.

## SOLUTIONS

We suggest strengthening six key points based on the challenges that we identified:

- (a) devising and implementing appropriate legislation,
- (b) improving outreach programmes to enhance responsible ownership,
- (c) expanding free spay-neuter programmes,
- (d) increasing the capacity and geographical coverage of animal shelters,
- (e) legislating, prohibiting and controlling intentional and unintentional feeding of dogs and
- (f) using a combination of non-lethal and lethal techniques for controlling dog populations, as per requirement.

For these steps to be effective, it is essential to strengthen relevant institutions and (re)formulate policies based on scientific evidence.

## WAY FORWARD

The D4R tool is versatile and in line with the forest landscape restoration (FLR) approach. It is designed to aid tree planting initiatives for a variety of purposes, including biodiversity conservation and agroforestry models. We intend to verify the tool's results and assess how well it aligns with the specific site conditions and restoration goals in different locations throughout the Western Ghats.



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ATREE, Royal Enclave, Srirampura, Jakkur Post, Bangalore 560 064  
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