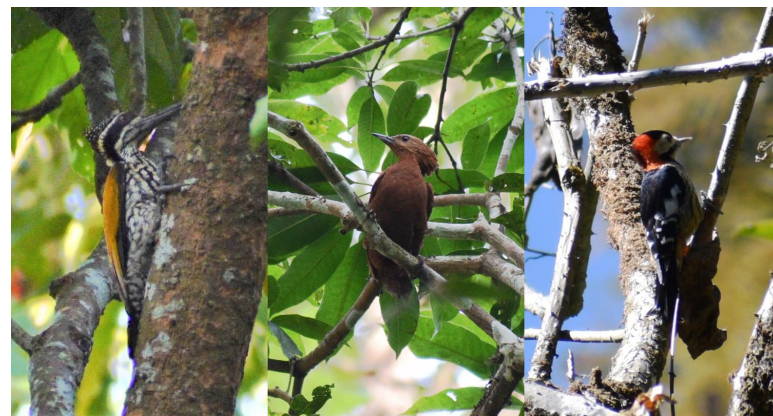


EASTERN HIMALAYA

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Woodpeckers in differently-managed forests of Darjeeling Himalaya



Left to Right: Greater Flameback (*Chrysocolaptes guttacristatus*), Rufous woodpecker (*Micropternus brachyurus*) & Crimson-breasted Woodpecker (*Dryobates cathpharius*) - Aditya Pradhan

Woodpeckers are known for their characteristic foraging and nesting behaviour. They hammer and chisel tree trunks and branches looking for food (primarily insects), and nest holes in dead trees. This group of birds typically inhabits wooded areas, and prefer large, tall and dead/decaying trees which are associated with old and mature forests. Further, woodpeckers are known to modify their environment and provide resources to a wide variety of forest-dwelling animals. Due to their close association with forest ecosystems, woodpeckers are considered to be excellent indicators of forest health and bird diversity. Vibrant colours, drumming behaviour, and loud unmistakable calls allow woodpeckers to be easily monitored, making them effective forest indicator species.

Darjeeling Himalaya is known to harbour 69% of total woodpecker diversity in India, making it a hotspot of woodpeckers in India. Darjeeling Himalaya is characterised by diverse forest management regimes - traditional community - managed agroforests, the privately -

managed tea garden forests, and the government-managed reserve forests and protected areas. Despite their contiguity with one another, these forests differ in forest structure, forestry operations, and standing tree diversity, all of which affect woodpecker community assemblages. Studies focusing on ecology, distribution and diversity of woodpeckers have never been conducted in Darjeeling. There is lack of studies in India to understand the diversity, distribution, or ecology of woodpeckers in differently-managed forests in socio-ecological landscapes. On the other hand, global studies have shown that the representation of woodpeckers is high in human-dominated landscapes. Thus, to understand what the presence and diversity of woodpeckers in the production landscapes of Darjeeling Himalaya indicate, we are currently conducting a systematic study covering all the three differently-managed forests along an elevation range of 250 to 2500m.

We have recorded nine species of woodpeckers: Greater Flameback, Greater Yellownape, Lesser Yellownape, Grey-headed Pygmy Woodpecker, Grey-headed Woodpecker, Bay Woodpecker, Rufous woodpecker, Crimson-breasted Woodpecker, and Darjeeling Woodpecker. Our preliminary observations from the field suggest that few woodpecker species may be restricted to specific habitats that are available in different forest management regimes, while few may be restricted to different elevation ranges. Fieldwork and increased sampling efforts in the coming months will give us a clearer picture on how woodpeckers respond to differently-managed forests of Darjeeling Himalaya.

Aditya Pradhan

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The changing food culture of the Lepchas of Dzongu, North Sikkim



Traditional food items still used for rituals - Pema Yangden

Locality is said to be inextricably linked to indigenous and traditional food cultures. Studies have shown that the majority of the world's rural population continues to engage in small-scale food production but this does not always mean that their diets are healthy, diverse, or with appropriate eating habits. According to researchers, this is because of the global shift to commodity food production and the widespread use of processed foods. The "circularity of food production by smallholder farmers' seems to have been broken by a shift away from primarily subsistence agriculture to subsistence plus commodity agriculture". Similar trends were observed in our studies in the Lepcha Reserve of Dzongu in North Sikkim. The food culture of the Lepcha community now consists of rice as a staple compared to the previously multi-cereal diet. Cultivation of local food crops is rapidly being replaced by cash crops. The current farming system is a settled terrace farming system growing fruits, vegetables, cash crops, and some cereal crops. This also includes the domestication of livestock which plays a vital role in agriculture and the food culture of the communities.

Traditional local foods are now more part of the varied traditional ceremonies of the Lepchas rather than part of their daily diets. The majority of the younger generation are unaware about the significance and values of these foods. Their tastes and preferences lean towards ready-to-eat or processed foods that are readily available. All indigenous food and knowledge may be lost if this trend continues.

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Studying Pangolins in the Tea Plantations of Darjeeling Himalayas



Tea Landscape at Tyrzin Tea Estate - Meghna Limboo

Globally famous for exquisite Darjeeling tea, the stringently maintained tea fields forms a critical habitat for two threatened Asian Pangolins- Indian Pangolin (*Manis crassicaudata*) and Chinese Pangolin (*Manis pentadactyla*). Pangolins are the only scaly mammals and are also the most trafficked mammals in the world. In India both the species are protected under Schedule I of Wildlife Protection Act (WPA-1972). However, conservation in these landscapes is challenging as species conservation is not a priority in these commercial production landscapes, nor do they come under the usual paradigm of wildlife conservation policies.

Pangolins are likely to soon become extirpated across Darjeeling Himalaya unless effective conservation actions are initiated. Pangolin conservation actions in these socio-ecological landscapes are also impeded by lack of information and robust baseline data. To bridge this gap, we are studying these elusive Pangolin in 5 of the tea plantations in Rangbhang valley of Darjeeling Himalayas.

Local people can often provide knowledge and information on these species and local knowledge is increasingly seen as an important source of information for cryptic species like Pangolins. We are also engaging with people living in these sites to compare their knowledge and attitudes towards, these species. The respondents have reported direct sightings, provided information about its population trends in recent years and also provided photographs of direct sightings. According to them, the key threats to the species include human interference, poisoning due to weedicides, accidental drowning in the tubs constructed in tea fields. Ethnozoological practices pertaining to these species were common among

the local people as well as among traditional faith healers.

Pangolins are myrmecophagous (feeding on ants) and excavate burrows. Therefore rapid burrow surveys were also conducted in these landscapes to fully substantiate its presence, access habitat preferences and understand the effect of different environmental parameters. Further surveys will elicit insightful information and the findings of this research will supplement strategic pangolin management plan in Darjeeling Himalayas. We also aim to strengthen community participation for its conservation in these sites.

Meghna Limboo
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Learning from observations - Climate change impacts, adaptation and mitigation



Participants at the exposure visit - Tshering Bhutia

Focusing on climate change adaptation and mitigation practices, a two day exposure visit was organised for the women farmers of Sittong III under Kurseong Sub division of Darjeeling District. 12 women farmers were taken to the Sepi Village, in Rimbick where ATREE has been promoting climate change adaptation and mitigation measures in agriculture, agroforestry, restoration of degraded land and efficient energy since 2014.

The event created a platform for the participants (farmers) to learn about the various aspects of climate change and its impacts, climate smart practices, adaptation and mitigation practices through observations and interactions with the local farmers. This also encouraged them to share, and learn about local innovations for climate adaptation which is expected to build their capacity and motivate them to opt for climate resilient practices. The event was organised as a part of the Norwegian Agency for Exchange Cooperation (NOREC).

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Refresher training on Climate Smart Farming



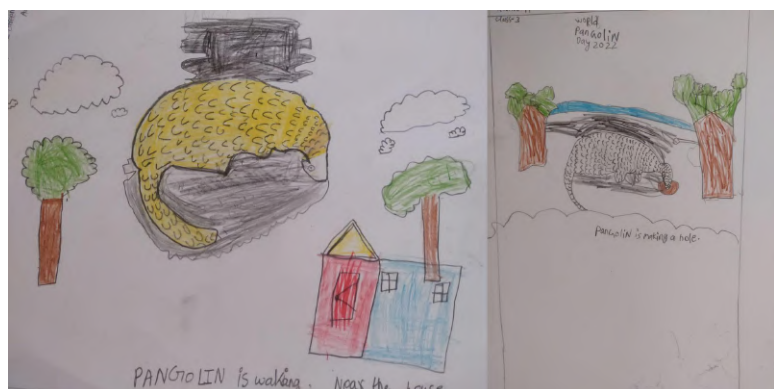
Participants at the Refresher training - Tshering Bhutia

A three day refresher training was conducted for small farmers in Rajahatta village, Darjeeling on climate smart (natural) farming.

Rajahatta village is located in the fringe of Senchel Wildlife Sanctuary where ATREE has been working to improve the capacity of the communities on various aspects of farmland development since 2014. Climate Smart Agriculture was one of the interventions that was introduced to enhance their livelihoods through training, demonstration and need base input support. 23 farmers took part in this training. This is expected to be helpful in fostering a culture of continuous learning and adaptation. This training was conducted under Norwegian Agency for Exchange Cooperation (NOREC) program.

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Celebrating World Pangolin Day 2022 - Pangolin: through the eyes of children



Some of the entries in the drawing competition

World Pangolin Day - on 19th February is celebrated to raise awareness on Pangolins. We have been engaged in ecological research of Chinese Pangolin in the tea gardens of Darjeeling since 2014. Here youth and children are stakeholders and stewards. They form the basis of change in a society. The role they choose to play is crucial for positive societal changes and also for conservation of local biodiversity, including the pangolin.

Keeping this in view, we celebrated the World Pangolin Day - 2022, by holding a drawing competition "Pangolin – through the eyes of children" where children drew and expressed what they knew about pangolins in their local environment. Through this, we expected to enhance awareness about the species amongst the children.

50 children from junior and senior sections of different local schools in the Rangbhang Valley of Darjeeling, participated in the event held on 21st and 22nd February 2022. The drawings were evaluated and the best drawings were given appropriate prizes.

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NMHS project closure workshop and Regional Seminar

As part of the project 'Key ecosystem services and biodiversity components in socio-ecological landscapes of Darjeeling – Sikkim Himalaya: deriving management & policy inputs and developing mountain biodiversity information system' funded by National Mission on Himalayan Studies, Ministry of Forests, Environment and Climate Change, ATREE in collaboration with Sikkim University organised a closure workshop and regional seminar titled 'Insights on maintaining / sustaining biodiversity elements and development of policy framework for socio-ecological landscapes in the Himalaya' on the 20th and 21st of January 2022. The main objectives of the workshop were

- i. to disseminate the findings of the study to the relevant stakeholders, and
- ii. to receive inputs and suggestions on the policy documents (prepared as an output of the project) from various experts from India and outside.

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Capacity building trainings for tourism enterprise



Participants at the training in Rajahatta, Darjeeling - Poonam Rai

Tourism is one of the major drivers of economic development in the Darjeeling hills. There is already a well-established tourism network across the region and recent trends show a significant increase in the number of homestays in rural areas. However, many of the operators are not trained in basic hospitality skills and etiquette. Hence, as part of the NOREC project capacity building of tourism enterprises was conducted.

Community members of Sittong II recognize homestays as a lucrative livelihood activity. Converting their homes to homestays is popular in Sittong however many operators lacked knowledge on business standards, hospitality etiquette, marketing and promotion. A training was conducted on basic hospitality and soft skills which included health & hygiene, housekeeping, customer service, food & beverages, marketing and promotions essential to exhibit a hospitable and safe environment for tourists.

Residents of Rajahatta, another village with the potential to develop as a tourism destination, have also shown interest in the developing homestays. In recent years many farmers have shifted to the roadside/highway to operate restaurants and tea-stalls as an alternative livelihood activity. This was largely due to an increase in wildlife crop depredation as the village is located close to Sanchel Wildlife Sanctuary. Frequent crop raids by wild animals have been ongoing for many years. Various mitigation strategies have failed to deter the animals from entering the fields. Compensation policies and schemes to indemnify the people for the crop losses are meagre and inadequate. Hence community members are abandoning agriculture to seek better opportunities. Introducing rural tourism based on homestays can be a way to provide alternative livelihoods and perhaps an incentive to return to agriculture.

To this end, introductory training sessions were conducted in Rajahatta for aspiring and potential homestay entrepreneurs with the concept of sustainable tourism, basics of operating homestays and helping the community identify and manage a form of tourism that showcases the rural life, art, culture, nature and heritage.

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Some of the installed ICSs- Sanjeeb Pradhan

Training on Bio Briquette Technology for members of SHGs



Participants at the Bio Briquette training- Sanjeeb Pradhan

ATREE - Darjeeling under the Norwegian Agency for Exchange and Cooperation - NOREC, conducted 2 days training on making bio briquettes as an efficient energy technology for domestic use and entrepreneurship. 23 women members of self-help groups in Selpu, in Darjeeling district, West Bengal participated in this training. The training focused mainly on practical demonstration and each individual trainee made at least 5 briquettes during the training. ATREE also provided 3 sets of biomass-based briquette moulding machines to Sittong Lat Multipurpose Women's Cooperative society to undertake production of bio-briquettes at a large scale.

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Training of Efficient Energy Technology: Improved Cook Stove

Fuelwood is still the main source of energy in rural areas of Darjeeling for cooking, space heating and preparing livestock feed. With an objective to promote energy efficient technology to communities, ATREE with technical support from Namsaling Community Development Centre, (NCDC) Ilam, Nepal, conducted 5 days Improved Cook Stove (ICS) installation training. During this training participants were able to learn about

selection of appropriate soil, and other required materials for brick making process, and were able to make over 200 bricks. They also learnt about different models of ICS and materials required for installation. As part of the training 5 units of 2 pot ICS were installed in 5 houses.

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Dzo Tyuim Harvest Festival 2021



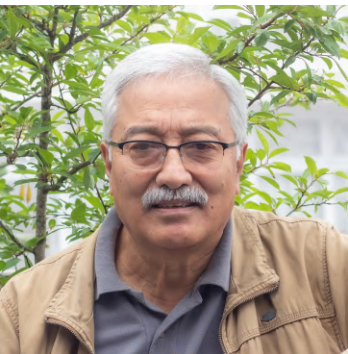
Traditional Folk dance performed by Lepcha youth during the festival
- Pema Yangden

Dzo Tyuim festival celebrates the annual harvest festival by bringing forgotten cultural practices and traditions to light. From November 12th to November 14th, 2021, the celebration was held in Lingthem, a beautiful village in Dzongu North Sikkim, and was organised by local youth and entrepreneurs. ATREE, through the SHEFS project supported, the festival through communication products. Traditional paddy harvesting practices, exhibitions, local foods, traditional sports and customs were among the highlights of the festival. During the festival, ATREE exhibited the findings from the SHEFS project in Dzongu. Several local women

Self Help Groups demonstrated, exhibited, and sold local cuisine. All the food was made with locally sourced ingredients and prepared locally. Homestay operators were encouraged to promote local food as a means of boosting the economy through this kind of sustainable tourism event. In addition, many new homestays were successfully established in the region.

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Known Unknowns: Bon Pradhan



Mr. Bon Pradhan a resident of Darjeeling is a businessman and a self-taught amateur photographer who developed interest in nature photography while photographing wildflowers. He started his career in a travel agency and got

introduced to the richness of the natural environment around Darjeeling and Sikkim with ornithologists like Robert L. Flemming Jr. (author of Birds of Nepal) and Oleg Polunin (author of Flowers of the Himalaya). He became an avid reader of the flora and fauna of the region and developed a keen interest on moths after his participation in National Moth Week in 2021. He is now involved in photo documenting moths around his home and learning about the various species found in Darjeeling. With his [4,685 observations of 644 species on iNaturalist](#) he is by far the highest contributor among citizen scientists from this region. He has these contributions in less than a year.

Grants

1. "Transforming lives through Efficient Energy Technologies and Restoration of degraded lands in the Tea landscape of Darjeeling" NortonLifelock, as part of their CSR initiative.
2. Value-Added Products from Invasive Plant Species for Improving Livelihoods of Marginalised Communities in Indian Himalaya In Collaboration with Kashmir University and NIT Srinagar funded by the Himalayan Bioresources Mission, Department of Biotechnology.
3. Strengthening resilience and reducing vulnerabilities of rural communities of Africa and Asia. Norwegian Agency for Exchange Cooperation (NOREC) program
4. Field Validation of the People's Biodiversity Registers of 3 Biodiversity Management Committees from Papum Pare, East Siang and East Kameng Districts of Arunachal Pradesh. Arunachal Pradesh Biodiversity Board
5. Survey and conservation of woodpeckers in differently-managed forests outside protected areas of Darjeeling Himalaya, India' - Oriental Bird Club Conservation awarded to Aditya Pradhan
6. Bats of Darjeeling-Sikkim Himalaya: effect of forest patch-sizes on species diversity. Bat Conservation International Student Scholar Award 2022 to Thangsuanlian Naulak

ATREE's mission is to promote socially just environmental conservation and sustainable development by generating rigorous interdisciplinary knowledge that engages actively with academia, policy makers, practitioners, activists, students and wider public audiences. ATREE's Northeast / Eastern Himalayas Programme has a direct presence in the Darjeeling and Sikkim Himalaya with a range of local partners in the other states of North East India.

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