Sikkim is interspersed with numerous sacred sites among which devithans (abode of goddesses) are a conspicuous feature of the rural landscape. Devithans are small patches of community conserved areas where the local people worship a plethora of deities. Apart from being an ethnic heritage, the basis of their existence is founded on a strong animistic belief system and myths upheld by the indigenous people. The traditional religious customs and rituals performed at these sites provide cultural association of the people with their land. Devithans are not just places of worship but a dynamic site having cross-cutting matrices of cultural politics, social mobility, and ecological value.

33 devithans were surveyed in 9 selected villages in the West district of Sikkim. These were mapped and their features documented. These devithans are semi built small natural open spaces except for three of them which are concrete. These are associated with residing deities and are worshiped to protect the village against natural calamities or wild animals and prevent the outbreak of an epidemic. They are present at the periphery or within the villages since time immemorial. The villagers emphatically state that the reigning deities should be worshiped to acknowledge their ownership of land and water. Around 20 of these devithans occur with natural water sources which further reinforces their presence.

Shamans are regarded as the spirit medium bridging the gap between the common beings and deities. They also locate the devithans which establishes their legitimacy among the believers. The local believers in the villages collectively organise the rituals annually in these spaces for the wellbeing of the whole village. There are limited activities within these spaces and certain taboos governing these devithans.

The devithans exemplify community conserved areas outside protected area regimes. They are rich in biodiversity, have fairly undisturbed habitats and sometimes have water sources. These ecosystems provide cultural services that encompass the attributes of spiritual, aesthetic, recreational and educational features. They serve as an instrument for the communities to establish their autochthony and sense of belonging to their land in a region having a complex social web. The erosion of the belief system in the form of discontinuity of various traditional practices is the greatest threat to the existence of these devithans. According to local communities, the decline in animistic practices with the influence of other religions that do not practice nature worship and the decrease of animal sacrifice are also some factors diluting their presence. The ‘devithans’ which is a part of Sikkim’s rich cultural and social tapestry occupy less space both in the physical landscape and in wider policy-making and academic research. From a conservation perspective, these provide an opportunity for community-based conservation for places that are rich in biodiversity, natural resources, and ecosystem services.
 Assessing food systems in Dzongu, North Sikkim

Dzongu valley located in North Sikkim is known for its rich biodiversity as well as for the rich culture and traditions of Lepchas. As part of the Sustainable and Healthy Food Systems (SHEFS) project ATREE is working on the food systems of Lepchas. The main objectives of the research are

1) To understand the drivers of change in food systems and diet and their impacts on the communities in Sikkim Himalaya (Dzongu, in North Sikkim)
2) To provide policy inputs from the study to various sectors of the Government of Sikkim.

A preliminary assessment of the food systems of 20 villages through mapping exercises and focus group discussions was initiated earlier this year. Food systems have drastically changed in the landscape and there is complete dependence on distant markets for food. Local food is mostly used during festivals and cultural events and are undervalued. There have been larger changes in the agriculture systems due to various policies and schemes of the government where the emphasis has been on cash rather than food. This has led to loss of agrobiodiversity and traditional crops. In the coming months, we will be doing an in-depth analysis and further collection of primary data to understand these changes and their drivers.

Meghalaya: ‘Invisible’ shifting cultivation & paper forests

A research study published in the journal Land in 2019 by one of ATREE’s Ph.D. students found gross misrepresentation of both shifting cultivation and forest cover estimates by government statistics and other research studies in India. Using the West Garo Hills district in Meghalaya as a case study, PhD student Mr. Amit John Kurien along with co-authors Dr. Sharachchandra Lele and Dr. Harini Nagendra primarily focused on conceptualizing a rigorous framework for mapping of shifting cultivation landscapes to then see if their results matched with official statistics and if they revealed flaws of any kind. The study comes in the wake of a special report on shifting cultivation by NITI Aayog in 2018 that criticized existing official statistics of different departments in India for the discrepancies in estimates of shifting cultivation that frustrated policymakers, preventing them from taking informed positions for policymaking and land management.

Based on analysis of fieldwork and Landsat 8 satellite data from 2014 our colleagues highlighted the following: Indian mapping studies that estimate shifting cultivation never clearly defines what shifting cultivation is and what all land-covers it constitutes when remote-sensed mapping is undertaken. Prejudiced categorizations such as ‘wastelands’, and ambiguous ones such as ‘current jhum’, ‘abandoned jhum’ make for incomprehensible definitions in mapping studies.

They point out that in Meghalaya the average active cultivation period in shifting cultivation is for 2 years and covers a total of 18% area of the district while fallsow separately cover 21% making shifting cultivation the single largest land-use (39%). This indicates its continued reliance by the rural Garo community. They also point out that most studies also completely ignore the tree plantation land-use class widely present in Northeast India in general. In fact, none of the multiple government statistics examined including The Wastelands Atlas of India, Directorate of Economics and Statistics, Forest Survey of India, among other research studies revealed the types of plantations in the landscape. Our colleagues find that, in fact, commercial horticultural plantations (cashew, areca, rubber) amount to a total of 30% of the landscape again showing the importance of this land-use in people’s lives. It also appears that most of these were otherwise being classified by agencies such as FSI as some forests or another.

Most research studies don’t make clear what a forest is and what it is being mapped for. Official estimates use inadequate or legal definitions of forest making actual forest cover figures difficult to discern. Contrary to popular notions of large forest expanse in West Garo Hills, our colleagues find that old-growth forest (defined as relatively undisturbed vegetation areas greater than 20 years of age) is only 9.7% thus calling into question not only FSI estimate of 79% forest cover but also their quality of interpretation and accuracy as well the official
understanding of shifting cultivation and forests. Importantly, the study also finds that shifting cultivation is certainly intensifying and that the extent of tree-plantation crops is positively correlated with shortened fallow periods (high intensity of land-use). This indicates that plantation expansion on hills occurs at the cost of land allocated for shifting cultivation leading to intensification, and possibly lowered production.

From a policy perspective, the authors call for an attentive revision of India’s official land-use mapping protocols because of the uncertainties and lack of clarity in the end goals of mapping, definitions of land categories, and unreliable estimation techniques. Full paper available here: https://www.mdpi.com/2073-445X/8/9/133

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Looking for the elusive White-bellied Heron, Ardea insignia

As part of our threatened species programme we are documenting the presence of White-bellied Heron (WBH) in new sites of Arunachal Pradesh. In March 2019 WBH was recorded from Tawa River of Kamlang Tiger Reserve (KTR), Arunachal Pradesh as part of the Tiger Monitoring Programme of the Forest Department. This was the first record of WBH in Arunachal Pradesh outside of the Namdapha Tiger Reserve.

Surveys have been initiated for the new population of WBH along the Lang and Tawa rivers. WBH is known to prefer an undisturbed riparian habitat in Namdapha, and KTR has such habitats with its impenetrable terrains for humans and daunting river tributaries that have abundant fishes for the species. Survey at Tawa River resulted in signs that could belong to the species but these are highly speculative as of now. Shallow depth, a combination of still and rapid water currents, gravels and boulder banks, broad-leaved hilly forest constitute the characteristics of Tawa River which is similar to the scientifically described WBH habitats elsewhere. This area originally belonged to the Miiju Mishmi tribe who depended on the resources of these forests. The communities migrated to the nearby villages which were closer to urban areas. They still believe that the land belongs to their ancestors and occasionally visit the river for fishing during winter.

We do not know about the interactions of the communities with WBH when they shared the same habitat. Did the Heron coexist with the people or did the habitat become conducive once the people left? The stretch of rivers inside KTR will be surveyed rigorously in order to find out how these habitats sustain the population of a species that is elusive and very low in number.

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Training on environmental friendly agriculture practices

A training on ‘Environment-friendly Agricultural practices’ was organised at Suruk village of Kalimpong District from 2-6 December 2019 as part of the National Mission on Himalayan Studies (NMHS) funded project entitled ‘Key Ecosystem services and Biodiversity components of the socio-ecological landscape of Darjeeling-Sikkim Himalaya: Deriving management & policy inputs and developing mountain biodiversity information system’.

The objective of the training was to enhance the capacity and skills of 67 farmers to implement farming practices that are environment friendly. The participants were trained through a series of theoretical, practical and discussion sessions. Each participant was encouraged to practically demonstrate components discussed during the training. The training included sessions with an integrated approach to agriculture management. This included soil and soil nutrient management, crop management, insect pest and disease management, and soil moisture conservation. The training emphasised on utilisation of locally available resources/materials and encouraged the cultivation of diverse traditional crops, which are often believed to be suitable and resilient to changing weather patterns experienced in the region.

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Developing entrepreneurial skills in Darjeeling

In Eastern Himalayas, ATREE is promoting different local enterprises—Improved Cook Stoves micro-enterprise, Community Managed Tourism, Honey enterprise and Mustard oil enterprise for enhancing the livelihoods of local communities. The mustard enterprise which was initiated in 2018 is one of the latest pilot interventions of ATREE-Darjeeling in collaboration with the National Bank for Agriculture and Rural Development (NABARD). Mustard was historically grown in the fringe villages of Singalla National Park used for food (leaves and stem) and oilseed but in the later years, cash crops like potatoes and peas replaced this crop. In the following years, unpredictable weather patterns and crop depredation lead to a severe decrease in productivity and therefore farmers were ready to try mustard as an alternative crop. Mustard is also considered climate resistant and its flowers support pollinators. There are 193 farmers involved in this enterprise. This group will be registered as a Farmer Producer Organisation. In the trial year, the enterprise produced 526 kilograms of oil seeds and extraction of oil from these is ongoing. This is a pilot initiative for ATREE’s conservation and livelihoods work to function at an institutional level and not at the household level like it has been doing in the past.

Outreach workshops for biodiversity documentation

Outreach workshops were held to train local communities and students from rural schools for biodiversity documentation in various sites of Kalimpong district of West Bengal and East and South districts of Sikkim.

7 workshops were organized to train local people for biodiversity documentation through the use of their Smart phones with an android application called “iNaturalist”. iNaturalist is a citizen science project and an online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe.

The objectives of the workshops were:

I. To inform the general public about biodiversity and enlist their help in documenting the biodiversity of their area.

II. To build linkages between amateur nature enthusiasts, students and the general public with researchers, academicians, and other experts to effectively document biodiversity and

III. To identify individuals who can be active participants in documenting biodiversity in their region.

A total of 253 participants attended these workshops and 153 observations were uploaded as part of these trainings.
As part of a larger biodiversity documentation project, ATREE is documenting bats in the socio-ecological landscapes across Sikkim-Darjeeling Himalaya. Preliminary information was collected from the local communities from their knowledge of these species on roosting and foraging sites. These were then searched during the day for mist-netting in the evenings. We also used a bat sound recorder to ascertain the presence of bats. In this preliminary period, we were successful in documenting 4 species of bats - Cynopterus sphinx, Rhinolophus luctus, Rhinolophus affinis, Hipposideros sp. and Taphozous. Detailed surveys will be conducted to document this little-studied group of mammals in Sikkim and Darjeeling.

Sanjeet Pradhan a native of Kurseong, has joined the Darjeeling Project Office as Coordinator for the Food Future Initiative. Sanjeet has an MSc. in Forestry from Kumaun University, Nainital. From 2017 until October 2019, he worked with UNDP as the Technical Expert - Forest & Water in a Swiss Agency for Development and Cooperation (SDC) supported project. Before this, he worked as the Regional Coordinator with Tetra Tech ARD for the Forest-PLUS project supported by USAID. He also worked with WWF India for almost 8 years as the Assistant Landscape Coordinator for Kanchendzonga Landscape Programme, project SERVE (Save the Environment & Regenerate Vital Employment).

Food Future Programme supported and in collaboration with the Centre for Social and Environmental Innovation ATREE was initiated for Darjeeling and Sikkim from December 2019. Key objectives of the initiative are: 1) To promote local, endemic and seasonal food in Darjeeling-Sikkim Himalaya by linking to tourism 2) To make an attempt to change the demand side of local tourism (to sustainable standards) using food tourism as a tool. 3) To incentivise the preservation of local food traditions by linking with tourism.

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 Office has a direct presence in the Darjeeling and Sikkim Himalayas and Assam, and works with a range of local partners in the other states of north east India.