

Eastern Himalaya

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The Eastern Himalayan Water Paradox: Scarcity amidst plenty

A look at the scarcity & disparity of water resources in Darjeeling which lies in the Eastern Himalayan Region.

The Eastern Himalayan Region of India receives more than 2,000 mm of rainfall annually that translates to volume of water available per capita far above the Falkenmark index of 1,000 m³/year. However, there have been several studies and experiences reported of water crisis in this region – a paradox of water poverty in a so-called 'water-rich' region.

Darjeeling in the Eastern Himalaya, belongs to a district by the same name, in the state of West Bengal is one such town experiencing this paradox for decades among many towns and villages in the region. The communities in this town depend on municipal supply, springs, streams and private suppliers for their domestic water needs. The Water Works department of the town Municipal council responsible for supplying water through private piped water supply and public standpipes to households and commercial establishments is obsolete to meet the present demands. It is struggling with a crumbling age-old distribution system built in the 1910s for a population one tenth of the current 120,000. The formal supply coverage by the town municipal council today can barely reach to one fifth of the population and runs for a maximum of an hour twice or thrice a week during the rainy season and barely once a week during dry months. Post-monsoon flows in many of the springs that dot the landscape, which more than 60% of the communities depend on are also depleting due to massive land cover change in the landscapes upstream. These springsheds are mostly managed by the communities living in their vicinity, while much of the catchments are controlled by the state departments. The informal supplies include hand-drawn carts to tanker trucks among others who continue to take advantage of the water paradox throughout the year, sourcing from springs and streams in the outskirts of the town. The more the number of water sources a household has access to, the less vulnerable they are to water scarcity. However, such access is heavily dependent on the financial and social status of a particular household and also their spatial location within the town boundaries.

The persistent water crisis in the town also varies across the seasons due to the seasonality of the monsoons and the floating population. This water crisis

is also said to emerge due to the difficult terrain, posing challenges to storage that is needed for harnessing supply through the dry months. The current municipal infrastructure for water storage is insufficient to tap even a fraction of the annual stream flow in the upper catchments which feed the reservoirs during the monsoon seasons. The floating population includes tourists, and students who are enrolled in the boarding schools of the region. Incidentally the tourist season also overlaps with the dry season adding to the water crisis. The tourists and the boarding school student community significantly contribute to the economy of the town and the region. Hence, the twist to the paradox appears where they provide economic benefits to the region on one hand but add to the water crisis.



Lal Dhiki spring in Darjeeling town centre - by Rinan Shah, 2016

The municipal council's efforts to augmenting water sources to increase their storage and supply capacity haven't been able to keep up with the increase in the demand. The municipality has 32 wards with differences in the number of springs, population density, and distance from the municipal supply source. In addition to the above factors, the fragile political history of the region might also affect the kind of initiatives that the municipality and other state bodies could have taken to handle this crisis. My research work in this region attempts to look at various factors that lead to domestic water scarcity and experiences of the communities. I will be doing it by disentangling the drivers of water scarcity by looking at the various water sources for the region and the changes associated with them. The formal and informal institutions concerned with the water crisis in the region will also be considered for study of this disentanglement.

- Rinan Shah (rinan.shah@atree.org)



Training on Woodcrafts

Opportunity for entrepreneurship for local youth of Manas

Manas National Park, a World Heritage Site, receives thousands of visitors throughout the year. The presence of rich flora and fauna and scenic beauty are key attractions for tourists. However, connecting most local communities with benefits that tourism can potentially bring in is a very big challenge. As a result, the motivation for promoting local products is minimal even though most of the local communities have traditionally made various handicraft products. Additionally, employment and entrepreneurship opportunities are scarce and most young people migrate to metropolitan cities for work often for very low wages and in dismal conditions.



Participants at the Woodcrafts Training Programme
-by Brojo Basumatary

ATREE organized a 15 day training programme on woodcrafts from 3rd to 17th October, 2017 for eight unemployed youngsters from fringe villages of Manas National Park for entrepreneurship in woodcrafts. RWDA – A Space for Creative Expedition, hosted the training at Art Craft Village, Bodofa Cultural Complex, Kokrajhar and engaged 4 resource persons to train them. The training covered drawing, preparation of wood and tools, carving wood into various animals and traditional forms and polishing and varnishing sculptures. An early output of the training was that 4 trainees formed a group to work together and produce woodcraft work. So far they have sold 10 pieces worth Rs. 10,000. The Range Officer of Bansbari Range, Manas National Park has provided space for a workshop as well as sale in the Range Office premises.

-Brojo Basumatary (brojo.basumatary@atree.org)

Citizen Science Initiatives in Northeast India

The Assam Biodiversity Portal (ABP) Project has been progressing steadily. In this quarter 1 Regional Meeting, 4 District Workshops and 3 Bio-Blitz events were organized. The regional meeting was held at Jorhat with government officials, NGOs,



Bio-Blitz participant documenting biodiversity at Daboka Reserve Forest, Nagaon - by Chandan Bhuyan

biodiversity experts and academicians from local colleges participating from 9 districts of upper Assam (Lakhimpur, Dhemaji, Tinsukia, Dibrugarh, Sivasagar, Charideo, Majuli, Golaghat & Jorhat). In total over 200 people have attended these events and 1,300+ observations of species have been contributed this quarter. The ABP project is now in its final phase with mainly events in Barak Vally remaining (Southern Assam).

Additionally, a workshop and Bio-Blitz was held in Roing in collaboration with Bombay Natural History Society to initiate a citizen science movement in the Mishmi Hills of Arunachal Pradesh as part of the Northeast India Biodiversity Portal initiative. Sustaining the interest of participating citizens to contribute and use these biodiversity portals meaningfully was one of the biggest challenges faced. The momentum is slow but biodiversity documentation requires each and every citizen to participate since there are many times as many citizens as there are scientists and researchers!

-Rohit George (rohit.george@atree.org)

Farmers' conclave - International Mountain Day

Forty-five farmers from fringe villages of Sanchel Wildlife Sanctuary, Singalila National Park and the villages around Sukiapokhari town in Darjeeling district came together to discuss mountain agriculture, their challenges in the face of environmental (climate change, ecosystem loss and degradation) and economic changes. Change in weather patterns leading to change in time of flowering, fruiting and maturing of major crops have resulted in farmers coping with changes in cropping patterns. This is further made difficult by loss of crops, both food and cash by increase in crop depredation by wild animals. Water scarcity in farming emerged as a prominent issue mainly due to the drying up of springs which is a problem for crops particularly those sown and grown in winter. Further, dry winter spells have increased with decrease in winter rain. Most farming systems in the hills/mountain are dependent on the monsoon rains but the rain patterns have changed with more intense rain days rather than the steady rains experienced by the landscape in the past.



Agricultural fields prepared for sowing in Rajhatta village
-by Tshering Bhutia

Various government sponsored schemes in the agriculture sector are available in the Block Development Offices but these have not been accessed by farmers as there is a lack of awareness about these schemes. Moreover, many of these schemes have criteria and conditions that can't be fulfilled by marginal and small landholders in the hills/mountains.

Outmigration and emphasis on family planning have severely affected hill/mountain farming because of the dearth of human resource in agriculture systems that are still un-mechanized. With ongoing outmigration, the landscape may face "rampant urbanization" that would leave no space/scope for improving key ecosystems or agriculture in the near future.



Maize fields in Gurдум
- by Tshering Bhutia

"There will be no one in agriculture after the present generation", expressed one of the farmers from Singalila National Park.

There is an urgent need to have a paradigm shift in planning for sustainable farming systems in the hills/mountains - a system that will be able to cope with both environmental as well as economic changes.

- Dr. Rinzi Lama (rinzi.lama@atree.org) and Tshering Dorjee Bhutia (tshering.bhutia@atree.org)



Does Tenzi Sherpa reflect our conservation intervention success?

An introspection

Park Guides are important local stewards who have the capacity to influence visitors through their knowledge of the Park as well as through appropriate messages and behavior that support conservation. Park guides mandatorily accompany visitors in Singalila National Park (SNP). SNP is a strong hold of the Red Panda, and has seen an exponential growth of tourism in the last 20 years. Our assessment of tourism in SNP identified inadequately trained local guides as one of the major challenges to sustainable tourism and conservation. In 2014-15 we took up a capacity building programme for these guides in response to the dire need for appropriate intervention to use the local guides as agents of delivering knowledge for conservation.

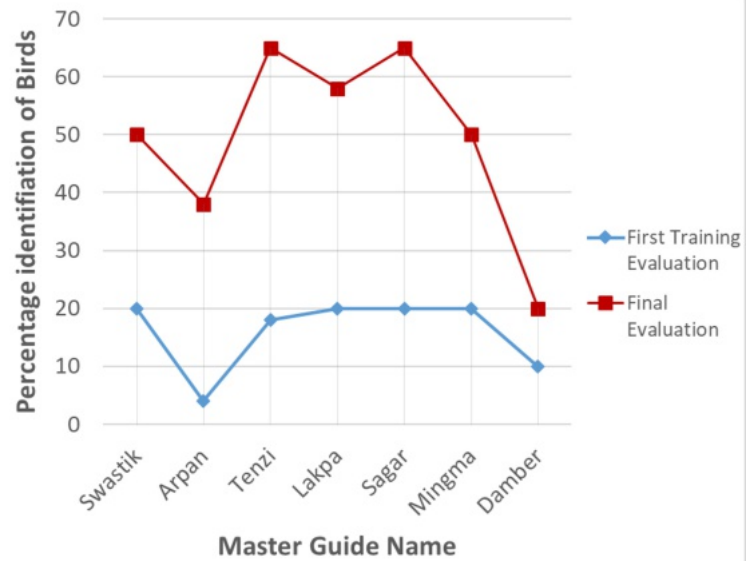


Figure 1. Capacity of local guides in bird identification post training.

Tenzi Sherpa was one of the local guides trained as a Master guide. There were six more guides who received this intensive one-year training with Tenzi. This training was done in phases and included periodic refresher courses and evaluations, a comprehensive training on first aid and rescue at the Himalayan Mountaineering Institute, an English speaking course and field trainings on flora and fauna identification. As many as 49 other local guides were also trained by these Master guides.

All the trainees showed improvement in their knowledge base as the training progressed (Figure 1). Tenzi topped the progress chart followed by Sagar. Tenzi pursued building his career as a local guide but Sagar did not.

Today, 2 years after the training Tenzi is a well-known guide, popular, confident and much sought after by travel agencies for his capacity to identify birds, flora and his understanding on subjects related to the Park. He and a few other trainees weaved a worthy livelihood out of the training programme.

Therefore is Tenzi an indicator of our intervention success? Did this training address the issue of tourism impacts on Red Panda conservation in SNP? How effective has this capacity building programme been in the larger conservation context of SNP?

Eastern Himalaya Naturenomics Forum



Figure 2. Tenzi Sherpa and others during their training in Himalayan Mountaineering Institute.
-by Dr. Sunita Pradhan

Tenzi and six others are products of the capacity building programme in Singalila - an early indicator that most of them are improving in the job with a probability of influencing the conservation problem of tourism impact in Singalila. A "good" guide like Tenzi makes 20-25 trips and guides an average of 55 visitors annually in SNP.

Hence, seven Master guides and 49 guides trained from our programme would guide an average of 2,800 visitors. This scale is not adequate when it is pitted against the 9,000+ annual visitors to the Park. Though the capacity building programme for the local guides was an appropriate site specific intervention, it did not match the scale of the problem SNP is experiencing. Moreover, we have little idea how this is influencing the visitors and thus the larger context of conserving the Red Panda and the region.

Recent government initiatives to make paved roads in Singalila is likely to encourage more visitors. Now, one of the ways by which the landscape can be fortified is by aggressive awareness and capacity building of local stewards and institutions in a scale that will effectively address the problem. Tenzi and other trained guides have built their livelihood but the initiative has to go further to bring about changes in how tourism is practiced in SNP.

- Dr. Sunita Pradhan (sunita.pradhan@atree.org)



ATREE participants at Eastern Himalaya Naturenomics Forum

ATREE-Regional Office, Eastern Himalaya-Northeast India participated in the Eastern Himalayan Naturenomics™ Forum (EHNf) 2017. EHNf is a platform started by Balipara Foundation which provides a platform to foster multi-disciplinary collaboration and innovation in Northeast Himalayas. The key theme of EHNf 2017 was Rural Futures. As part of this Forum there were 16 posters exhibited, 7 talks from ATREE researchers and staff. Additionally, ATREE researchers also Co-chaired 4 panel discussions.

- Dr. Sarala Khaling (sarala.khaling@atree.org)

Grants

1 Key ecosystem services and biodiversity components in socio-ecological landscapes of Darjeeling - Sikkim Himalaya: Deriving management & policy inputs and developing mountain biodiversity information system from National Mission On Himalayan Studies, G.B. Pant National Institute of Himalayan Environment and Sustainable Development with Department of Zoology, Sikkim University as the lead organisation

2 Coordination Grant from Rainforest Alliance for coordinating the Rung Dung Khola River Watershed Action Plan.

- Dr. Sarala Khaling (sarala.khaling@atree.org)

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.

For more information contact

Dr. Sarala Khaling
Regional Director
sarala.khaling@atree.org

Rohit George
rohit.george@atree.org