National Mission on Himalayan Studies (NMHS)

HIMALAYAN RESEARCH FELLOWSHIP

(FORMAT FOR THE HALF YEARLY PROGRESS REPORT)

[Reporting Period: from April 1, 2016 to September 30, 2016]

Name of the Institution/ University:	Ashoka Trust for Research in Ecology and the Environment (ATREE
No. of Himalayan Research/SPF:	8
No. of Himalayan Junior Research/SRF:	2

Himalayan Research/SPF

SPFs Profile Description:

S. No.	Name of RA	Date of Joining	Name of the PI	Qualification	Thematic areas
1.	Aniruddha Marathe	01/04/2016	Dr. Priyadarsanan Dharmarajan	Masters in Biodiversity	Environmental assessment and management
2.	Barkha Subba	01/04/2016	Dr. Ravikanth G.	Masters in Biology	Sustainable management of land and water resources
3.	Annesha Chowdhury	01/04/2016	Dr. Soubadra Devy	Masters in Zoology	Environmental assessment and management
4.	Shweta Basnett	01/04/2016	Dr. Soubadra Devy	Masters in Biotechnology	Conservation and sustainable use of biodiversity
5.	Manish Kumar	01/04/2016	Dr. Jagdish Krishnaswamy	Masters in Ecology & Environmental Science	Sustainable management of land and water resources
6.	Urbashi Pradhan	01/04/2016	Dr. Soubadra Devy	Masters in Zoology	Environmental assessment and management
7,	Yangchenla Bhutia	01/04/2016	Dr. Ravikanth G.	Masters in Forestry	Conservation and sustainable use of biodiversity
8.	Anirban Datta Roy	01/04/2016	Dr. Nitin Rai	Masters in Wildlife Sciences	Supplementary livelihood options

Progress Report: To be filled for each SPF in separate row.

RA No.	Research Objectives	Achievements	Addressed Deliverables	Location of Field Site with Details, if any
1.	• Preparation of museum collections • Analysis of species richness patterns	• A reference collection of samples already collected to be used in future	One scientific communication about Species richness is almost finished and I will communicate it soon.	Eaglenest Wild life Sanctuary, Arunachal Pradesh.

		work. • Preparation of manuscripts about species richness patterns		
2	• Water Chemistry of three high altitude lakes in Sikkim. • Ecosystem services provided by the lakes	• We did a preliminary survey of the study area, looking at logistics and how best to proceed with sampling in areas far away from any technical facilities. • Application for research permit submitted to the forest department (online as well as hard copy to the concerned authority.) • Permit grant is still under process. • We will begin water sampling of the lakes March 2017 onwards	Study area reconnaissance, arrangement of technical facilities and other logistics.	East Sikkim
3.	• Number of LTEM sites established/investigated/robust data-sets generated. • Extent of scientific evidences generated across key sectors.	• Identification of 15 tea estates and small tea growers • Recconnaisance surveys for biodiversity assessments completed • Permit for research outside protected area and inside tea estate received from West Bengal Directorate of Forests and Darjeeling Tea Association	• Identification of sites for long-term environmental monitoring. • Relevant institutions identified and engaged. • Mainstreaming of long-term monitoring and building scientific evidence base across key sectors achieved.	The study has been identified as the Darjeeling tea-forest landscape lying between 600m and 2100m elevation.
4	To estimate the abundance of selected high altitude *Rhododendron* species in the Sikkim Himalayas	To understand the abundance of the *Rhododendron* species along the elevation gradient we laid our initial plots in Kyongnosla Alpine Sanctuary, located in East Sikkim. Belt transects of 50 x 20m were laid using stratified random sampling method. In all a total of 26 belt transects were laid across the elevation from 3400m to 4200m. The *Rhododendron* species occurring inside the belt were counted and its abundance was measured	• In Subalpine region falling between 3400 to 3800m five Rhododendron species were selected. These species occurred below the treeline below 3900m. The first three species *R.thomsonii*, *R.campanulatum* and *R.hodgsonii* were the species with high abundance and the last two species *R.cinnabarinum* and *R.campylocarpum* were the rare species.Among all *R.campanulatum* were the widest ranging species that occurred from 3400m to 3900m. • In Alpine region falling between 3900m to 4200m we selected five Rhododendron species. The first three species *R.anthopogon, R.aeruginosum* and *R.nivale* were among the dominant ones and the last two species *R.setosum* and	Sikkim is a small mountainous state in the Eastern Himalayan region extending approximately 114 km from North to South and 64 km from East to West, having a total geographical area of 7069 sq.km. The state is located between latitudes of 27° 5' N to 20° 9' N and longitudes of 87° 59' E to 88° 56' E. It has different forest types ranging from lower belt tropical Sal forests to the high alpine scrub. *Rhododendrons* form a dominating species all along the cool temperate, subalpine to the alpine zones

			R.wightii were the rare ones	
5	• Assess spatial and temporal variability in precipitation patterns across Sikkim Himalayas • Predict hydrological responses of springs and streams in the context of climate variability and climate change in the Sikkim Himalayas	• Maintaining five long-term monitoring sites for springs and streams. • Each site has one automatic discharge measuring station, automatic raingauges and soil moisture sensors. • Automatic weather stations maintained at 3 sites	• Maintaining stations for temporal and spatial monitoring of rainfall and streamflows across elevation gradients in Sikkim. • Detailed protocol for database management, quality control and data processing completed. • Satellite-based gridded rainfall products like TRMM and GPM were used to understand the spatio-temporal variability in rainfall across Sikkim.	Details of sites are: • Kyongnosla alpine sanctuary, East Sikkim • Fambongloh wildlife sanctuary, East Sikkim • Kanchendzonga National Park, West Sikkim • Mukter Dhara, Kamrang, South Sikkim • Gaddi khola, Gaddi, South Sikkim
6.	● To understand role of fragmented habitats outside protected areas in supporting biodiversity through higher order interaction such as pollination and dispersal	Literature review completed (see attachment). Field survey and site selection	Literature Review on:* • Forest fragments and ecosystem services • Bees as indicators • Case of orange pollination in Sikkim *Please find attached for more details.	EAST West Pendam, Pachek,Samdong, Kokaley, Patuk, Suntaley, Najitam, Bhansari and Rabdang (total 15 orchards) WEST Thambong, Sailigolai, Zoom, Namprick, Kabirthang and 4th mile. (Total 9 orchards) SOUTH Turuk, Tirikhola, Pabong and Kamrang (total 9 site)
7	Understanding the regeneration status of various Oak species in the forest of Sikkim Himalaya	Marked individuals for seed collection. Two to Five individuals per species were marked given their presence in the marked 0.1 hectare plots.	1. Seven different species of Fagaceae were found distributed along different elevation gradient. 2. The species comprised of three different genus I. Castanopsis II. Quercus and III. Lithocarpus Following are the list of species recorded. *1. Castanopsis indica* *2. Castanopsis tribuloides* *3. Castanopsis hystrix* *4. Lithocarpus fenestratus* *5. Lithocarpus pachyphyllus* *6. Quercus lamellosa &* *7. Quercus glauca*.	The Protected and Reserved forest of Sikkim, covering 900m to 3200m elevation. Following Protected and Reserved forest were visited to mark the trees. 1. FambongLho Wildlife Sanctuary, 2. Rabom Reserve Forest and 3. Kanchendzonga National Park (KNP) 4. Dzongu Reserve Forest 5. Maenam Wildlife Sanctuary Barsey Rhododendron Sanctuary
8	• What are the potential areas across the eastern Himalayas where supplementary livelihood options could be implemented? • What are the primary income generating eco-tourism related activities that can be implemented in these areas?	Based on extensive discussions and a review of current literature and media reports, we tried to identify biodiversity rich areas within the eastern Himalayas where rapid development threatens large scale changes among local communities. A short review based on the literature review has been prepared. This will form the basis for	● Identified north-central Arunachal Pradesh as a potential area in the eastern Himalayas where supplementary livelihood options could be implemented. ● High biodiversity values of Siang valley and relative isolation of tribal communities make it an important area for biodiversity conservation. ● Rich bird diversity, presence of rare bird species and increasing	We propose to conduct field surveys in north and central parts of Arunachal Pradesh. These surveys will determine the eventual finalization of the field site

		the next stage of the work which will comprise of a field survey in prospective field sites in northeast India	interest from ornithologists and birdwatchers suggest that bird-based ecotourism could be a good option for these areas. • Large scale threats to biodiversity from dams and increasing globalization of these upland areas are starting to cause economic and social changes that can be balanced by ecologically responsible tourism initiatives.	

Note: Data, table and figures may be attached as separate source file (.docx, .xls, jpg, .jpeg, .png, .shp, etc.).

Himalayan Junior Research/SRF

H-JRFs Profile Description:

S. No.	Name of JRF	Date of Joining	Name of the PI	Qualification	Thematic areas
1.	Vidyadhar Atkore	01/04/2016	Dr.Jagdish Krishnaswamy	Masters in Biodiversity	Sustainable management of land and water resources
2	Rinan Shah	01/04/2016	Dr. Shrinivas Badiger	Masters in Climate change and Sustainability studies	Sustainable management of land and water resources
3.					

Progress Report: To be filled for each JRF in separate row.

JRF No.	Research Objectives	Achievements	Addressed Deliverable	Location of Demonstration/ Study Site with Details
1.	• Quantify the relationship between biophysical factors on fish community structure (richness and relative abundance). • Evaluate the impact of altered flow regime below the dams on the certain life-history and reproductive guilds of fishes. • Study the impact of on dams genetic diversity of key native fish species. • Examine the species recovery downstream of a dam	Exploration of dummy data on quantifying the relationship between species richness/abundance and stream characteristics (channel morphology, average velocity, water temperature, dissolved oxygen, disturbance level). Literature review on fish guilds and important life-history traits. Ongoing literature review Literature review completed (see attachment). Exploratory data analysis on dummy dataset is ongoing. Exploratory data analysis on dummy dataset is ongoing	• Gathering secondary data on current patterns in diversity and distribution of fish communities in the region. • Exploration of dummy data on quantifying the relationship between species richness/abundance and stream characteristics. • Compiling literature review on fish guilds and important life-history traits. • Reviewing literature on genetic methods	Arunachal Pradesh
2.	• To understand the causes and effects of the domestic water scarcity in the eastern Himalayan towns. • The causes entail the biophysical and human induces changes in and around the water sources as well as the region to which the water is supplied and the extent of water utilization. • The effects will be assessed in terms of the availability and accessibility of water and the definition of well-being and sufficiency for the ommunities. • The political and economic drivers for the manifestation of scarcity will be investigated	• Pilot visit with the Supervisor to the primary field site i.e. Darjeeling and the probable field site for comparison, Gangtok (24th to 28th June 2016). Planning for another visit in February 2017. • Completed the comprehensive exam which is a mandate for a registration as a PhD candidate (2nd November 2016). • Approval of the concept note, presently carrying out a literature review and working on the synopsis for research proposal presentation to be held by March 2017	An understanding of the institutional structure in the two field sites which provides safe drinking water	The primary study site is the Darjeeling Municipal Town in West Bengal. The water sources for the town are the Municipal supply (private household connection and public standpipes), springs and private water supply (tankers or households selling/sharing their excess water). The municipal as well as the private water suppliers are also dependent on the springs which might be as close to the town or as far as 10-15 kilometres. The frequency of supply is very low – once a week during the lean months and twice to thrice a week during the monsoon months. The town has 32 wards which are spread across an area of 10.57 sq. km. The Municipal supply acquires its supply from the reservoirs in the Senchal Wildlife Sanctuary. A probable second site for a comparative case study would be Gangtok, Sikkim. It is the capital city of Sikkim and is a glacier dependent one for its water source. The development trajectory as well as the political history is

				very different from that of Darjeeling. These are some of the factors that would be used to carry out a comparison
3.	• • •	• • •		

Note: Data, table and figures may be attached as separate source file(.docx, .xls, jpg, .jpeg, .png, .shp, *etc*.).

(Signature of Registrar/ Head of Department)

Report (hard copy) should be submitted to:

The Nodal Officer, NMHS-PMU
G.B. Pant National Institute of Himalayan Environment and Sustainable Development (GBPNIHESD)
Kosi-Katarmal 263 643, Almora, Uttarakhand

Report (soft copy) should be submitted to:

E-mail: nmhspmu2016@gmail.com