

## **National Mission on Himalayan Studies (NMHS)**

### **Himalayan Research Fellowship**

(FORMAT FOR THE HALF YEARLY PROGRESS REPORT)

**[Reporting Period: from September to December 2016]**

<b>Name of the Institution/University:</b>	Dr Y. S. Parmar, UHF ,Nauni , Solan, HP
<b>No. of Himalayan Research Associate</b>	2
<b>No. of Himalayan Junior Research Fellows</b>	3

### **Himalayan Research Associate**

#### **H-RAs Profile Description:**

<b>S.No.</b>	<b>Name of RA</b>	<b>Date of Joining</b>	<b>Name of the PI</b>	<b>Qualification</b>
1.	Dr. Tanvi Kapoor	06.10.2016	Dr. S K Bhardwaj	PhD Environmental Science
2.	Dr. Reetika Sharma	19.09.2016	Dr. S K Bhardwaj	Ph D Microbiology

**Progress Report:**

<b>RA No. and Project Title</b>	<b>Research Objectives</b>	<b>Achievements</b>	<b>Addressed Deliverables</b>	<b>Location of Field site with Details, if any</b>
HRA-001 (To develop strategies for adoption of renewable energy technologies for energy conservation and security).	<ol style="list-style-type: none"> <li>1. To generate database on present energy scenario in HP.</li> <li>2. To estimate the potential of various renewable energy technologies being used in the state.</li> <li>3. To quantify the biomass production and its energy generation potential in the state.</li> <li>4. To study the impact of traditional fuel consumption in households on indoor air quality</li> </ol>	<ol style="list-style-type: none"> <li>1. A pretested questionnaire was prepared to conduct survey for studying energy consumption pattern.</li> <li>2. Survey was conducted to study the energy consumption pattern of rural households in three different blocks of Shimla district.</li> <li>3. It was observed that fuel wood and LPG were the main source of energy in the study area.</li> <li>4. From the primary survey of different villages in Shimla district it was observed that about 90 percent of rural population preferred fuel wood as main source of energy.</li> <li>5. Further, it was revealed from the study that 85 percent of the people use LPG for cooking purpose and biogas was not used at all in the selected area.</li> <li>6. About 88.5 percent of the people accepted that there is a great need of solar light to reduce the electricity consumption.</li> </ol>	<ol style="list-style-type: none"> <li>1. Database on renewable energy sources.</li> <li>2. Energy conservation and security guidelines.</li> </ol>	<ol style="list-style-type: none"> <li>1. Four districts in different agro-climatic zones of Himachal Pradesh were selected for the study namely Shimla, Kullu, Hamirpur and Kinnaur.</li> <li>2. Three blocks in each district were selected. Shimla (Basantpur, Theog, Mashobra), Kullu (Kullu, Nagar, Banjar), Hamirpur (Hamirpur, Bhoranj, Nadaun) and Kinnaur (Pooh, Kalpa, Nicchar)</li> <li>3. A survey was conducted to find out energy consumption pattern in three blocks of Shimla district.</li> </ol>
HRA-003 (Environmental compatibility of infrastructure development including	1. Environmental Impact Assessment of hydroelectric power projects of the state of Himachal Pradesh.	1. In the face of rising risks due to the rapid development of hydropower projects which is one of the major infrastructural sectors in Indian Himalayan Region (IHR), present study was conducted to assess the effect of Gaj Hydroelectric Project located at Kangra (HP)	1. Prediction of environmental compatibility of different infrastructural sectors in Indian	1. Gaj Hydroelectric Project located at village Gharoh near Dharamshala in the Kangra district in Himachal Pradesh, which is a run-of-river scheme utilizing inflows of Gaj Khad

<p>border roads and climate resilience of core infrastructure and basic services delivery assets)</p>	<p>2. Environmental Impact Assessment of industrial activities in Himachal Pradesh.</p> <p>3. Environmental Impact Assessment of national highways construction and expansion in Himachal Pradesh.</p> <p>4. Environmental Impact Assessment of urbanization in Himachal Pradesh.</p> <p>5. Environmental Compatibility Assessment of basic services delivery assets of the state of Himachal Pradesh.</p>	<p>on the environmental quality.</p> <p>2. A detailed survey of the site was conducted on the basis of which impact and non-impact area within the total project area was selected which was analyzed qualitatively and quantitatively for terrestrial biodiversity by standard quadrat method.</p> <p>4. The samples were collected from the selected sites by rapid sampling and were further identified and analyzed for floristic diversity.</p> <p>5. Various parameters like circumference at breast height (cbh) for each tree individual, frequency, frequency class, density and abundance were calculated with the help of standard formulas for each species in selected plots to assess the impact due to proposed infrastructural intervention on the biodiversity.</p> <p>6. The indicators based on relative basal area, density, frequency as Importance Value Index and Shannon index of the general biodiversity will be calculated for the site thereafter.</p> <p>7. A pretested questionnaire was prepared and the local communities, working staff of the project were interviewed for the collection of baseline data on socio-economic status of inhabitants due to impact of the selected site.</p>	<p>Himalayan Region (IHR).</p> <p>2. Effect of infrastructural sectors on socio-economic status of inhabitants of the Himalayan Ecosystem.</p>	<p>and Leond Khad, tributary of Beas River, was selected for the study.</p> <p>2. It has total installed capacity of 10.5 MW with three 3.0 MW units/turbines with a catchment area of 59.6 Sq km and is owned by Himachal Pradesh State Electricity Board (HPSEB).</p>
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## Himalayan Junior Research Fellows

### H-JRF's Profile Description

S.No.	Name of H- JRF	Date of Joining	Name of the PI	Qualification
1.	Radhika Pathania	7-10-2016	Dr S K Bhardwaj	Pursuing PhD in Environmental Science
2.	Aditya Rana	06-09-2016	Dr S K Bhardwaj	Pursuing PhD in Environmental science
3.	Kartikey Sahil	22-09-2016	Dr S K Bhardwaj	Pursuing PhD in Environmental Science

#### Progress Report:

H-JRF No.	Research Objectives	Achievements	Addressed Deliverables	Location of Field site with Details, if any
H-JRF006 (To mitigate the greenhouse gas emission through waste management)	<p>1. Source specific quantification and characterization of urban solid waste of different towns of Himachal Pradesh</p> <p>2. Bio recycling of biodegradable urban solid waste through composting</p> <p>3. To evaluate the effect of urban solid waste compost on horticultural crop production and to work out their chemical fertilizer equivalence</p>	<p>1. A survey was carried out in urban and semi urban areas of Dharamshala municipality to assess the status of solid waste management in the town.</p> <p>2. A stratified random sampling technique was used to estimate the urban solid waste of Dharamshala town.</p> <p>3. Survey of the selected houses were carried out using pre-structured proforma for collecting the primary data on waste generation, quantification and composition of urban solid waste of Dharamshala town was determined on wet weight basis.</p> <p>4. Scientific balance with a capacity of 5kg (for household building) was used to</p>	<p>Eco-friendly waste management</p> <p>Database on solid waste management</p>	<p>On the basis of agro-climatic zones different towns have been selected for the study namely Dharamshala, Shimla, Solan, Ghumarwin and Hamirpur cities under different districts i.e Kangra, Shimla, Solan, Bilaspur and Hamirpur.</p>

	<p>4. To calculate the greenhouse gas potential from urban solid waste</p> <p>5. To study the energy generation potential of urban solid waste</p>	<p>determine the actual quantity of organic waste generated at house hold generation sources.</p> <p>5. The individual components were segregated manually at generation sources and weighed. The individual component after segregation and weighing was characterized as biodegradable and non-biodegradable</p> <p>6. Based on house-hold survey the per capita waste generation rate will be calculated.</p>		
<p><b>2. H-JRF008</b> (To develop sustainable ecotourism in Himalayan region)</p>	<p>1. Evaluation and assessment of the existing ecotourism sites for sustainability.</p> <p>2. Assessment of the environmental and social impacts of various ecotourism activities.</p> <p>3. Identification of potential ecotourism sites in the state.</p>	<p>1. A survey was conducted at Chewa (District Solan) ecotourism site for detailed analysis of sustainability of the site with respect to its carrying capacity.</p> <p>2. A pretested questionnaire was prepared and the visitors, local community, managers of tourist establishments were interviewed for the collection of baseline data on ecotourism impact assessment at the site.</p> <p>3. Assessment of the environmental and social impacts of various ecotourism activities at the site will be done using calculated Tourism Carrying Capacity (TCC) and Physical Carrying Capacity (PCC) and Effective real carrying</p>	<p>Sustainable ecotourism in the Himalayan region. Delineation of potential ecotourism sites in Himachal Pradesh. Recommendation of strategies for sustainable ecotourism in Himachal Pradesh.</p>	<p>Chewa (District Solan) Ecotourism sites was selected for the study.</p>

		<p>capacity (ERCC).</p> <p>4. Multi-Criteria Decision Making (MCDM) methods such as Analytical Hierarchy Process (AHP) and the Geographic Information System (GIS) as an integrated technique will be used to assess suitable land use and determination of suitable areas for new ecotourism sites based on bio-physical characteristics of the land ecosystems and socio-economic data.</p>		
<p><b>3. H-JRF007</b> (To study air, water and soil pollution in selected towns of Himachal Pradesh).</p>	<p>1. To study the different air pollutants and air toxic levels in selected towns.</p> <p>2. To prepare inventory for the various air pollutants measured in selected towns.</p> <p>3. To study the sources and extent of pollution in water.</p> <p>4. To study sources and extent of pollution in soil.</p>	<p>1. A survey was carried out to collect the samples of air and water in Mandi town and Baddi-Barotiwala-Nalagarh (BBN) region of Himachal Pradesh.</p> <p>2. The towns had been selected purposely on the basis of residential, commercial, industrial, traffic and tourist activities for the monitoring of the air and water pollutants.</p> <p>3. The data was recorded for eight hours at each location of the selected town during post-monsoon (December-January) season by using Respirable dust sampler (Cat. No MBLRDS-002) and Environmental Perimeter Air Station (EPAS).</p> <p>4. The observations recorded for air pollutants were respirable suspended particulate matter (PM<sub>10</sub>), NO<sub>2</sub>, SO<sub>2</sub>,</p>	<p>Inventory of air pollution. Reduction in greenhouse gas emissions.</p>	<p>On the basis of agro-climatic zones different towns are selected for the study namely Mandi, Dharamshala, Solan, Shimla, Kullu, Rekong peo, Kangra, Una, Ponta sahib and BBN region.</p>

		<p>Volatile Organic Compounds (VOCs) and the water samples collected from different sampling sites will be analyzed for following parameters viz. pH , EC, TDS BOD, COD and heavy metals.</p>		
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