

National Mission on Himalayan Studies

PERFORMA FOR THE HALF YEARLY PROGRESS REPORT

(Period from 01/04/2016.....to 30/9/2016.)

Project Title -: Sustainable use of Sikkim Himalayan Biodiversity for socio-economic development of mountain villages with special reference to *Ophiocordyceps sinensis*, *Hippophae salicifolia*, *Docynia indica* and *Rhus chinensis*: Technology development, alternative livelihood and conservation

Sanction No. and date -: NMHS/MG-2016/005/8502-7

Dated 31-03-2016

Institution Name-: SIKKIM UNIVERSITY

Personal Details -:

Name and Address of the PI-:	Dr. Dhani Raj Chhetri, Associate Professor Department of Botany, Sikkim University
Name and Address of the Co PI-:	Dr. Arun Chettri, Assistant Professor Department of Botany, Sikkim University
	Dr. Ghanashyam Sharma, Program Manager, The Mountain Institute India
	Dr. Bharat Kumar Pradhan, Research Fellow, State Biodiversity Board, Govt. of Sikkim

Partner Details:

Sl No	Name/ Address	Work assigned to partners	Fund allocated to partners during the period
1.	Dr. Dhani Raj Chhetri, Associate Professor Department of Botany, Sikkim University	1. Field survey of the study sites,. Ecological Niche Modelling 2. Bio-chemical analysis of the fruits of <i>Hippophae salicifolia</i> , <i>Docynia indica</i> and <i>Rhus</i>	Rs. 2439500.00

2.	Dr. Arun Chettri, Assistant Professor Department of Botany, Sikkim University	<i>chinensis</i>	
3.	Dr. Ghanashyam Sharma, Program Manager, The Mountain Institute India	1. Development of propagation techniques and transfer of technology for <i>Hippophae salicifolia</i> , <i>Docynia indica</i> and <i>Rhus chinensis</i> 2. Involvement of communities in product exhibition during agricultural and organic fair organized by the State Government. 3. Community involvement in ABS negotiation process.	Rs. 720700.00
4.	Dr. Bharat Kumar Pradhan, Research Fellow, State Biodiversity Board, Govt. of Sikkim	1. Development of Policy guidelines for the entire value chain by involving relevant government and other associated agencies 2. Value chain analysis, establishment of forward and backward linkages, and prospects of Access and Benefit Sharing of the selected species 3. Development of guidelines for the entire value chain in collaboration with the relevant government and other marketing agencies	Rs. 642200.00

Project Objectives

1. Population and habitat assessment, ecological niche modelling and conservation of *Ophiocordyceps sinensis*, *Docynia indica* and *Rhus chinensis* in the Sikkim Himalaya.
2. Impact of climate change on the ecology of the selected species.
3. Value chain analysis, establishment of forward and backward linkages, and prospects of Access and Benefit Sharing of the selected species.
4. Nutritional and nutraceutical analysis of *Hippophae salicifolia*, *Docynia indica* and *Rhus chinensis* for value addition of products.
5. Extraction and development of marketable product from *Docynia indica* and *Rhus chinensis*.
6. Development of Policy guidelines for the entire value chain by involving relevant government and other associated agencies.

Completion in the last six months in % (According to each Deliverables)-:

Sl No	Output/ achievements	Quantifiable Deliverables (as per sanction letter)	Performance in terms of Monitoring indicators	Remarks
1	30%	Ecological Niche Modelling methods developed	Baseline data to be developed	a).Extensive field survey done in Sikkim Himalaya b).Community consultation carried out c). Study sites for the selected species identified in three Districts of Sikkim.

Summary of progress -: (within 200 words)

Regarding the project, roles of each partner Institutes have been identified and clearly delineated. Preliminary field survey has been done extensively in three districts of Sikkim state for identification of study sites. A couple of community consultation programmes have already been conducted (Fig-1). The field survey was to be carried out quickly a little haste because the fruiting season of all the plants concerned had also begun with the beginning of the project period. As a result of these field activities, the study sites for all the species concerned could be selected (Table-1 & Fig-2) and their co-ordinates could be identified. A few fruits of *Docynia* and *Rhus* (Fig-5 & Fig-6) have been collected for study in the laboratory. With the help of local community members, the field observation method for *Ophiocordyceps* species near the Chinese border of Sherethang was also perfected (Fig-3 and Fig-4). However, the extreme terrain and climatic conditions restricted repeated field visits in the sites for *Hippophae* and *Ophiocordyceps*. Work on the standardization of sustainable harvesting method is under process. The purchase committee and project appointment committee has been formed, procurement of equipment is under process and the advt. for appointment of project personnel has already been forwarded for publication. Data on total number of beneficiaries and the progress on organic certification will be gradually generated as we progress further on the project.

Supporting data files/ maps/ tables/ figures of the results to be attached



Fig-1. Community consultation in progress in Lachen, North Sikkim

Table-1. Selected sites in Sikkim for the study of for *Ophiocordyceps sinensis*, *Hippophae salicifolia*, *Docynia indica* and *Rhus chinensis* showing co-ordinates and altitudinal range.

Sl. No.	Species	Study Sites	Latitude	Longitude	Altitude (m)
1	<i>Hippophae salicifolia</i>	Lachen, North Sikkim	27°44'52.92"N	88°33'3.033"E	2300-3200
2	<i>Hippophae salicifolia</i>	Lachung, North Sikkim	27°41'51.878"N	88°44'57.487"E	2300-3000
3	<i>Ophiocordyceps sinensis</i>	Serethang, East Sikkim	27°20'4.008"N	88°52'11.529"E	4000-4500
4	<i>Ophiocordyceps sinensis</i>	Panch Pokhari Area, North Sikkim	27°38'31.143"N	88°31'50.874"E	4000-4300
5	<i>Rhus shinensis</i> & <i>Docynia indica</i>	Lingee-Sokpay, South Sikkim	27°22'48.284"N	88°26'44.86"E	700-2000
6	<i>Rhus chinensis</i> & <i>Docynia indica</i>	Sumik-Khamdong, East Sikkim	27°17'24.53"N	88°27'49.54"E	700-2000
7	<i>Rhus chinensis</i> & <i>Docynia indica</i>	Ganchung, East Sikkim	27°14'24.869"N	88°37'45.303"E	1000-1800
8	<i>Rhus chinensis</i> & <i>Docynia indica</i>	Linkey-Bering, East Sikkim	27°13'48.692"N	88°39'58.153"E	700-1800

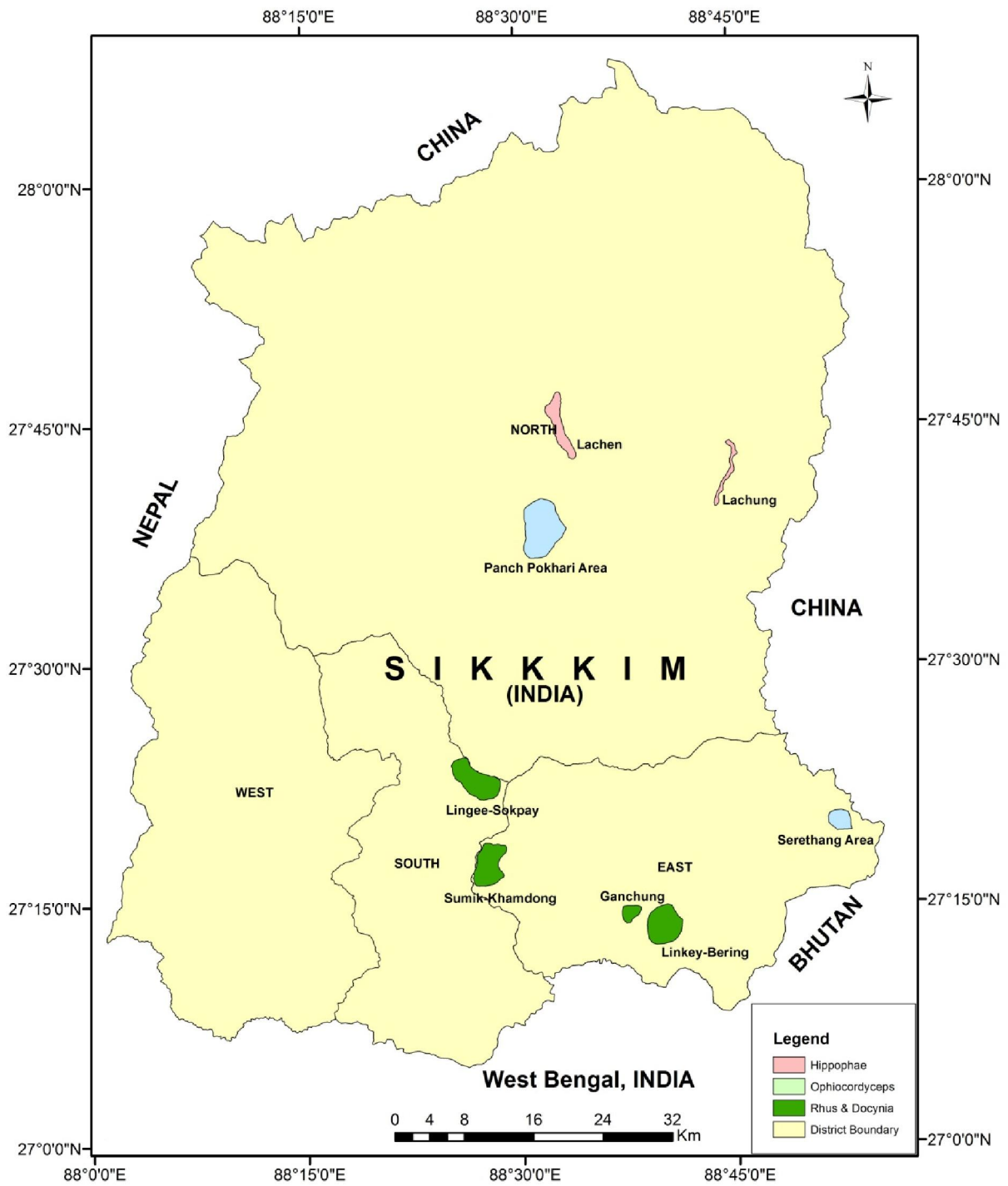


Fig-2. Map showing the study sites for *Ophiocordyceps sinensis*, *Hippophae salicifolia*, *Docynia indica* and *Rhus chinensis* in Sikkim Himalaya



Fig-3 Field observation of *Ophiocordyceps* in progress in Sherethang area, East Sikkim.



Fig-4. Freshly harvested *Ophiocordyceps sinensis*



Fig-5. *Rhus chinensis* plant in fruiting condition in its natural habitat at Lingee-Sokpay in South Sikkim



Fig-6 *Docynia indica* tree under fruiting condition at its natural habitat at Linkey-Bering, East Sikkim

Name of the PI-: Dhani Raj Chhetri

Signature -: 

Date-: 25/11/2016