

भारत सरकार/ GOVERNMENT OF INDIA
पर्यावरण वन मंत्रालय और जलवायु परिवर्तन मंत्रालय/MINISTRY OF ENVIRONMENT FORESTS & CLIMATE CHANGE



भारतीय वनस्पति सर्वेक्षण/BOTANICAL SURVEY OF INDIA
निदेशक का कार्यालय/OFFICE OF THE DIRECTOR

सी.जी.ओ. कॉम्प्लेक्स, तृतीय एम.एस.ओ. भवन/CGO COMPLEX, 3RD MSO BUILDING
ब्लॉक एफ, पाँचवां और छठा तल/BLOCK F, 5TH & 6TH FLOOR (ROOM NO. 549-555 & 649-655)

डी एफ ब्लॉक, सेक्टर 1, साल्ट लेक सिटी, कोलकाता – 64/DF BLOCK, SECTOR I, SALT LAKE CITY, KOLKATA – 700 064

No.: भा.व.स./BSI – NMHS/MG/Tech./20916-17

Date: 30.11.2016

सेवा में/To

Sri Kireet Kumar
Scientist G & Nodal Officer
NMHS (MG) – PMU, GBPNIHESD
Kosi Katarmal, Almora-263643

विषय/Sub.: Half yearly progress report update to NMHS (MG)-PMU, GBPNIHESD – reg.

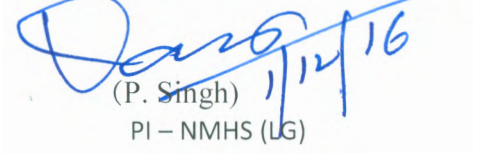
महोदय/Sir,

Kindly refer your letter no. NMHS/MG-2016/HPR13 dated 11.11.2016 on the above subject, I am sending the progress report for six month (1.4.2016 – 31.09.2016) in respect of the project entitled “Multidisciplinary Studies Sustainable Management of Selected National Parks in W. Himalaya” in the prescribed pro-forma (Annex. I & II).

This is for your kind perusal and needful.

सधन्यवाद/Thanking you,

भवदीय/Yours faithfully,


(P. Singh) 1/12/16

PI – NMHS (LG)

Director, BSI, Kolkata

संलग्न/Encl.: उपरोक्तानुसार/As above.

National Mission on Himalayan Studies

PROFORMA FOR THE HALF YEARLY PROGRESS REPORT

(Period from 01-04-2016 to 31-09-2016)

Project Title: Multidisciplinary Studies in Floristic Assessment, Ecological Analysis, Ecosystem Services, Conservation and Sustainable Management of Selected National Parks in W. Himalaya

Sanction No. and date -: Ref. No. NMHS/MG-2016/006/8504-7 Dt. 31-3-2016

Institution Name-: Botanical Survey of India, Kolkata & BSI, NRC, Dehradun

Personal Details -:

Name and Address of the PI-: Dr. Paramjit Singh, Director, Botanical Survey of India, CGO Complex, Salt Lake City, Kolkata-700064
Name and Address of the Co PI-: 1. Dr. B.K. Sinha, Scientist-F, BSI, Kolkata 2. Dr. S.K. Srivastava, Scientist-E, BSI, NRC, Dehradun 3. Dr. Kumar Ambrish, Scientist-D, BSI, NRC, Dehradun

Partner Details-:

Sl. No.	Name/Address	Work assigned to partners	Fund allocated to partners during the period
1.	Dr. Paramjit Singh Director Botanical Survey of India, Kolkata	Floristic Assessment Preparation of Database, Documentation of comprehensive flora	30,07,400
2.	Dr. Chandrasekar, Scientist-D G.B. Pant Institute of Himalayan & Development, Kosi Katarmal, Almora-263643, Uttarakhand	Ecological Studies, Analysis of ecosystem services, Impact of Climate Change on flora and vegetation.	7,96,200

Project Objectives -:

Objective(s) of the Project that will be achieved by the project

- Exploration and inventorisation of floristic diversity
- Estimation of endemism, categorization and reassessment of rare and threatened species of VoF and GHNP based on revised IUCN guidelines.

- Identification and documentation of economic/ socioeconomic uses of plants occurring within the park area along with future potentials of medicinal plants in the socioeconomy of local peoples.
- Ecological assessment (species richness, community structure, population structure, seasonal changes in plant community structure) of different groups of plants within the park and their role on the ecosystem along with functional dynamics and phenology.
- Impact of Anthropogenic and other factors on the plants.
- To identify the change in vegetation and species population due to climatic change and natural hazards including the assessment and impact of invasive species on indigenous flora.
- Detailed report on floristic and ecological studies along with conservation measures of RET species both *in-situ* and *ex-situ* in the proposed study area.
- To analyse the ecosystem services emanating from the National Park.
- To establish the relationships between the structural and functional parameters of the flora in context with recent natural calamity in Uttarakhand and Himachal Pradesh states and to suggest measures for conservation of the plant diversity in the area.
- Create awareness programme for local community towards the biological conservation and sustainable use of biodiversity.

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

Sl. No.	Quantifiable Deliverables (as per sanction letter)	Output/ achievements	Performance in terms of Monitoring indicators	Remarks
1.	Preparation of plant database (Valley of Flowers National Park and Great Himalayan National Park)	40% complete Herbarium exsiccata of Valley of Flowers and Great Himalayan National Park	40% completed	Documented the plant diversity in Valley of Flowers national park (Angiosperms: 520 taxa; Gymnosperms: 02; Pteridophytes: 29 taxa) based on herbarium and published literature. Further, a total of 104 taxa of bryoflora are also documented from Great Himalayan National Park, Himachal Pradesh
2.	Survey & Exploration of Floristic Diversity of	Tour to Valley of Flowers National Park undertaken w.e.f. 19 – 25 th Sep., 2016 and	10% achieved	Sapling of <i>Pinus wallichiana</i> recorded first time from the Valley of Flowers National Park.

	Valley of Flowers and Great Himalayan National Park	collected 78 specimens of angiosperms (c.29 families), 2 specimens of gymnosperms (2 families) and 42 specimens of lichens (c. 15 families) were collected. The preservation and identification of specimens are in progress Tour to be undertaken from 25 th Nov.,2016 for GHNP, HP		Data of different seasons are required to analyze the entire plant diversity patterns.
3.	Ecological Assessment (Valley of Flowers National Park)	One assessment tour was conducted w.e.f. 19 – 25 th Sep., 2016 and assessed five threatened species and compared with the earlier records (Fig. 1)	25% achieved	Analysis of data collected from Valley of Flowers in progress.
4.	Identification of RET Species (Valley of Flowers National Park)	Five species identified in Valley of Flowers National Park.	10% achieved	

Summary of progress:

i. Botanical Survey of India

Prepared baseline data on plant diversity of Valley of Flowers National Park and Great Himalayan National Park, as detailed below:

Valley of Flowers National Park: Angiosperms: Wadhwa *et al.* (1987) reported 600 species under 308 genera and 95 families of Angiosperms and 29 Pteridophytes from the valley of flowers and its environs. Kala (1993) carried out study on the floristic, ecology and conservation of plants in the valley for a decade and he made an inventory of 520 alpine plants exclusively growing in the Park; Gymnosperms: There is report of only two gymnosperms *Abies pindrow* and *Taxus wallichiana* in the National Park area; Pteridophytes: Wadhwa *et al.* (1987) reported only 29 taxa of ferns from valley of flowers.

b. Great Himalayan National Park: Based on literature, 104 taxa of Bryoflora recorded from Great Himalayan National Park.

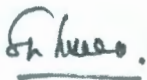
ii. G.B. Pant National Institute of Himalayan Environment & Sustainable Development

A field survey was conducted during 19 – 25th Sep., 2016 at Valley of Flowers National Park for the fulfillment of the objectives of the project assigned to GBPNIHESD, viz. ecological assessment of floristic diversity, status assessment of threatened, endemic and medicinal plants, analysis of floristic changes and analysis of possible loss of plants in relation to climate and anthropogenic aspects.

A total of 78 specimens of angiosperms (c.29 families), 2 specimens of gymnosperms (2 families) and 42 specimens of lichens (c. 15 families) were collected. The preservation and identification of specimens are in progress.

Five threatened species namely *Polygonatum verticillatum* (L.) Alloni (1.71 ± 0.41 ind/m²), *Dactylorhiza hatagirea* (D. Don) Soo. (1.76 ± 0.38 ind/m²), *Fritillaria roylei* Hook. (0.42 ± 0.8 ind/m²), *Podophylum hexandrum* Royle (0.78 ± 0.02 ind/m²) and *Malaxis muscifera* (Lindl.) Kuntze (1.00 ± 0.02 ind/m²) were analyzed for status assessment and data was compared with earlier records (Kala, 2005) to define the floristic changes (Fig. 1.). There was found massive decrease in the density of *Dactylorhiza hatagirea*, *Fritillaria roylei*, *Polygonatum verticillatum*, *Podophylum hexandrum*, while the density of *Malaxis muscifera* was increased when compared to earlier recorded density.

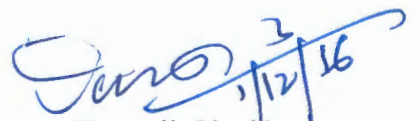
The diversity of *Polygonum polystachyum* Wallich ex Meissn. (2.49 ± 0.62 ind/m²) was found in higher density and may be a major invasive plant in the valley. One sapling of *Pinus wallichiana* A.B. Jackson was also recorded during exploration and considered as a new addition to Valley of Flowers National Park. It was found at an altitude of 3527 m a.s.l. in latitude 30° 43' 40.4'' N, longitude 79° 36' 07.7'' E (Photo. 1).



(S.K. Srivastava)
Co-PI (NRC-BSI)



(B.K. Sinha)
Co-PI (HQ-BSI)



(Paramjit Singh)
PI (Director – BSI)

Online Webpage Information of NMHS Project [MG]

1. **Project Title:** Multidisciplinary Studies in Floristic Assessment, Ecological Analysis, Ecosystem Services, Conservation and Sustainable Management of Selected National Parks in W. Himalaya
2. **Name of PI:** Dr. Paramjit Singh, Director, Botanical Survey of India, CGO Complex, Salt Lake City, Kolkata-700064
3. **Project Partner Details:**

S. No.	Name of the Partner	Roles & Responsibilities	Budget sanctioned
1.	Dr. Paramjit Singh Director Botanical Survey of India, Kolkata	Floristic Assessment	30,07,400
2.	Dr. Chandrasekar, Scientist-D G.B. Pant Institute of Himalayan & Development, Kosi Katarmal, Almora- 263643, Uttarakhand	Ecological Studies	7,96,200

4. Project Activities Chart:

PROJECT ACTIVITY	TIMEFRAME	DELIVERABLE
Project Activity 1 Appointment of JRF/RA/Field Asstt.	Q1 ----- Q2. Selection procedure of JPF conducted in Sept. 2016. Three JPF selected. Q3. Joining of three JPF in Oct., 2016	Three JPF selected. No candidate turned up for Field Assistant post. Now it is under process
Project Activity 2 Purchase of tour articles Laboratory Material	Q1 ----- Q2. Quotations for purchase of various equipment are invited and it is under process.	Under process
Project Activity 3 Collection / Compilation of Literature and secondary data	Q1 ----- Q2. ----- Q3. Collection and compilation of Literature and secondary data.	Collection and computerisation of Literature and secondary data compiled.
Project Activity 4 Processing of Collected specimens and analysis of	Q1.----- Q2. One field tour to Valley of Flowers conducted wef. 19-25 Sep., 2016. Collected 78 specimens. Processing and	Collection of plants in one season completed.

ecological data	identification of specimens are in progress.	
Project Activity 5 Sampling of data collection and ecological studies of Identification of specimens and analysis	Q1.----- Q2. Identification of plants collected from Valley of Flowers National Park is in progress. Ecological data collection completed and analysis is in progress.	Identification of plant specimens in progress. Ecological data analysis is in progress.

5. Equipment Details:

i. Botanical Survey of India

S. No.	Name of Equipment	Use of Equipment	Cost (in INR)	Remarks
1	SLR Camera with accessories 2 nos	To take the photographs of plant species, forest and vegetation types	1,85,998.00	It is under Process
2.	GPS - 4 nos	Recording GPS data for each plant species	90,800.00	It is under Process
3.	Printer Laser-jet – One	For printing day to day work, reports, data base prepared etc.	41,499.00	It is under Process
4.	Laptop	Feeding details of the secondary information and exsiccata of all the specimens collected from both localities	66,000.00	It is under Process
5	Field Gear Equipment	Field Survey and collection of plants	49,259.00	It is under Process

Note: Above items are yet to be purchased.

ii. G.B. Pant National Institute of Himalayan Environment & Sustainable Development

S. No.	Name of Equipment	Use of Equipment	Cost (in INR)
1	SLR Camera with accessories 1 nos	To take the photographs of plant species, forest and vegetation types	2,50,000.00

Note: Purchase order issued to lowest quoted firm.

6. Manpower Details:

i. Botanical Survey of India

S. No.	Name	Qualification	Designation	Salary
1.	Ms. Shalini Singh	M.Sc.	Junior Project Fellow	16000+20%HRA
2.	Mr. Rajnikant	M.Sc.	Junior Project Fellow	16000+20%HRA
3.	Mr. Kapil Kharakwal	M.Sc.	Junior Project Fellow	16000+20%HRA

ii. G.B. Pant National Institute of Himalayan Environment & Sustainable Development

S. No.	Name	Qualification	Designation	Salary
1.	Ms. Monika Bisht	M.Sc.	Junior Project Fellow	16000+10%HRA

6. The roles and responsibilities of the partners and budget:

Name of the Partner: G.B. Pant Institute of Himalayan & Development, Kosi Katarmal, Almora-263643, Uttarakhand

- Role of Partner (as mentioned in the proposal)
- Ecological assessment of floristic diversity and ecosystem services emanating from the National Parks
- Status assessment of plant diversity, including endemic, threatened and medicinal plants in the target region.
- Analysing floristic changes in the Park area.
- Analysing possible loss of plants in relation to climate and anthropogenic aspects (along with BSI)
- Providing awareness training about the plant diversity and sustainable plant utilization (along with BSI).

Sample Online Webpage for Project Information/ Summary Sheet:

Project Title: Rejuvenation of Springs and Spring-fed Streams in Mid-Himalayan Basins using Spring Sanctuary Concept

1. Project Details		
Sanction Date:	31-03-2016	
Project Category:	LG	
Year:	2015-2016	
Project Duration:	3 Years	
BTGs:	Sustainable Management of Land and Water Resources	
Project Site/ State/ Districts/ Villages Covered:	Kosi Basin (Kumaon Region), Ir God Watershed-Headwaters of Paschim Nayar basin (Garhwal Region), Sanj River Watershed of Himachal Pradesh, Senki Watershed of Arunachal Pradesh (NE Region)	
Organization/ Implementation Agency:	Garhwal Unit, G.B. Pant Institute of Himalayan Environment and Development (GPEHED)	
Project Partners:	S.No.	Name
	1.	Hydrological Response Unit (HRU), State Government
	2.	ITT Corvahan
	3.	Indian Institute of Meteorology, Pune
4.	National Institute of Hydrology, Roorkee	
		Roles & Responsibilities