

ADMINISTRATIVE ORDER

- Subject:** Project entitled "The Pranmati Basin, Himalayan Critical Zone Observatory (PBHCZO)".
- PI:** Dr. Vimal Singh, Department of Geology, Chhatra Marg, University of Delhi, Delhi-110007
- Co-PI:** Dr.N.C.Pant and Dr. Pankaj Srivastava, Department of Geology, ChhatraMarg,University of Delhi, Delhi-110007
- Co-PI:** Dr. Dileep Kumar Singh and Prof. Neeta Sehgal, Department of Zoology, University of Delhi, Delhi – 110007
- Co-PI:** Prof. Malay Mukul, Department of Earth Sciences, IIT Bombay, Powai, Mumbai-400076
- Co-PI:** Prof. A.L. Ramanathan, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi-110067
- Co-PI:** Dr. Vijay Shridhar and Dr. Kusum, School of Environment and Natural Resources (SENR), Doon University, Kedarapur, Dehradun, Uttarakhand-248001
- Co-PI:** Dr. Pavan Kumar Gayatri, CSIR - National Geophysical Research Institute, Uppal Road, Hyderabad - 500007
- Co-PI:** Dr. S.P. Sati, Veer Chandra Singh Garhwali Uttarakhand University of Horticulture & Forestry, Bharsar-246123, Pauri Garhwal (Uttarakhand)

Sanction of the President is hereby conveyed under Rule 18 of the Delegation of Financial Power Rules 1978 for implementation of the above-mentioned project at an estimated cost of Rs.5,34,52,040/- (Rs. 2,42,48,440/- to University of Delhi, Rs. 60,48,080/- to IIT, Bombay, Rs. 82,66,520/- to JNU, New Delhi, Rs. 94,08,920/- to Doon University, Dehradun, Rs. 23,43,360/- to NGRI, Hyderabad and Rs. 31,36,720/- to VCSGUUHF, Bharsar, Garhwal)for a period of three years (2021-22 to 2023-24).

2.0 Objectives:

Objectives under Phase - I

- To test the relationship between the creep on the hill slope and regolith development.
- To determine water pathways in the critical zone (coarse resolution study).
- To determine rate of soil production and develop its relationship with the topographic curvature.
- To understand weathering kinematics.
- To document biodiversity of aquatic organisms.
- To understand variation in aquatic biological life (Plankton, invertebrates, Fishes) with respect to Flow regimes.
- To understand how weathering of rocks, and route that water takes to flow, enriches the water body.
- To analyze the influence of anthropogenic and natural processes on nutrients flow, with particular attention on plant microbes and soil interaction.
- To study nutrients in water, soil, microbial mass, atmospheric pollutants & climate-altering compounds.
- To develop soil enzymes as an indicator of soil health.
- To investigate microbial functions as indicator of soil health.


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Objectives under Phase – II

- To understand the controls on the CZ thickness and establish ways to predict it.
- To determine relationship between rainfall, discharge, and sediment flux in this terrain. Also, to determine anthropogenic contribution to the sediment flux.
- To determine water pathways in the critical zone and evaluate factors controlling it.
- To compute water budget of Pranmati Gad.
- To study how CZ impacts ecohydrology in the Pranmati Gad.
- To study impact of stream flow due to snow melt and rainfall on fish population, and survival strategies of fishes during low flow conditions?
- To study the impact of physical processes complexity on aquatic food chain.
- To analyze the influence of anthropogenic and natural processes on nutrients flow, with particular attention on plant microbes and soil interaction.
- To characterize physical, chemical properties of aerosol and their variations/deposition on soil and water surface in critical zone.
- To develop suitable bio-indicator and biomarker for determining environmental stresses on soil.

2.1 Programme:

The outer skin of the Earth today is scarred by the anthropogenic activities occurring at unprecedented rates and is under pressure due to the growing population. It has become a challenge in front of society to understand what would be the effect of human interference with this Earth's Critical Zone (CZ) and whether this CZ would be able to sustain the life in future. The project work is first of its kind in which investigators having diverse expertise will jointly attempt to understand the functioning of the CZ and its interaction with life. The focus of the project is to establish a CZ-Observatory in a Himalaya region-Pranmati Basin. The variety of data from Geomorphology, Structural Geology, Pedology, Geochemistry, Hydrology, Geophysics, Zoology, and Environmental Science will be generated. Continuous monitoring and collection of new datasets would be carried out by installing various sensors, weirs, RTK-GNSS network and also by collecting samples for geochemical and isotope studies at close intervals. Moreover, the high-resolution topographic data and subsurface data would be generated using Terrestrial scanner and time domain electromagnetic investigations respectively. The outcome of the study is expected to throw light on how CZ functions in a dynamic terrain like Himalaya where tectonic and climatic forces interact with each other and humans are making their presence felt.

2.2 Implementing Organization:

The project will be jointly implemented by Delhi University; Indian institute of Technology (IIT), Bombay, Mumbai; Jawaharlal Nehru University, New Delhi; Doon University, Dehradun; National Geophysical Research Institute (NGRI), Hyderabad and Veer Chandra Singh Garhwali Uttarakhand University of Horticulture & Forestry, Bharsar (Uttarakhand).

2.3 Estimated Project Cost:

Total estimated cost of the project is Rs.5,34,52,040/- (Rs. 2,42,48,440/- to University of Delhi, Delhi, Rs. 60,48,080/- to IIT, Bombay, Rs. 82,66,520/- to JNU, New Delhi, Rs. 94,08,920/- to Doon University, Dehradun, Rs. 23,43,360/- to NGRI, Hyderabad and Rs. 31,36,720/- to VCSGUUHF, Bharsar, Garhwal) for a period of three years (2021-22 to 2023-24). The year-wise / item-wise fund allocation is given below:


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I. University of Delhi, Delhi

Sl. No.	Item	Budget in Rupees			
		1 st Year 2021-22	2 nd Year 2022-23	3 rd Year 2023-24	Total
A.	Recurring				
i.	Manpower Project Scientist-B (one) @ Rs.56,000/- + 24% HRA p.m. Junior Research Fellow (five) @ Rs.31,000/- + 24% HRA 1st & 2nd yr. and @ Rs. 35,000/- + 24% HRA p.m. for 3rd yr. Technical Assistant/Field Assistant (one) @ Rs.20,000/- + 24% HRA p.m.	8,33,280 23,06,400 2,97,600	8,33,280 23,06,400 2,97,600	8,33,280 26,04,000 2,97,600	24,99,840 72,16,800 8,92,800
ii.	Consumables	14,00,000	14,00,000	12,50,000	40,50,000
iii.	Travel	4,00,000	4,00,000	4,00,000	12,00,000
iv.	Other Cost (for DNA Analysis & Chemical analysis)	8,00,000	8,00,000	6,70,000	22,70,000
	Total Recurring	60,37,280	60,37,280	60,54,880	1,81,29,440
B	Overhead	50,000	50,000	50,000	1,50,000
C.	Non-Recurring				
i.	Refrigerated microbial shaker	59,69,000	--	--	59,69,000
ii	Server				
iii	Workstation				
iv	TDR				
v	Portable Water analysis kit				
vi	Inland fish cage (Hapa)				
vii	Water Proof Wader with boots (insulated)				
viii	Electro fisher				
ix	Portable cryocan (10L)				
x	Rotospin				
xi	Vortex shaker				
xii	Discharge Meter				
xiii	Nanodrop				
xiv	Deep Freezer (-80°C)				
	Total Non-Recurring	59,69,000	--	--	59,69,000
	Grand total A+B+C	1,20,56,280	60,87,280	61,04,880	2,42,48,440

II. IIT, Bombay

Sl. No.	Item	Budget in Rupees			
		1 st Year 2021-22	2 nd Year 2022-23	3 rd Year 2023-24	Total
A.	Recurring				
i.	Manpower Research Associate - I (One) @ Rs. 47,000 + 24% HRA p.m.	6,99,360	6,99,360	6,99,360	20,98,080
ii.	Consumables	1,00,000	1,00,000	1,00,000	3,00,000
iii.	Travel	2,00,000	3,00,000	3,00,000	8,00,000
iv.	Other Cost Monuments for GNSS survey points	2,00,000	---	---	2,00,000
	Total Recurring	11,99,360	10,99,360	10,99,360	33,98,080
B.	Overhead	50,000	50,000	50,000	1,50,000
C.	Non-recurring RTK GNSS System with supporting software and Laptop	25,00,000	---	---	25,00,000
	Grand total A+B+C	37,49,360	11,49,360	11,49,360	60,48,080

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III. (JNU), New Delhi

Sl. No.	Item	Budget in Rupees			
		1 st Year 2021-22	2 nd Year 2022-23	3 rd Year 2023-24	Total
A.	Recurring				
i.	Manpower Junior Research Fellow (two) @ Rs.31,000/- + 24% HRA 1st & 2nd yr. and @ Rs. 35,000/- + 24% HRA p.m. for 3rd yr. Technical Assistant/Field Assistant (one) @ Rs.20,000/- + 24% HRA p.m.	9,22,560 2,97,600	9,22,560 2,97,600	10,41,600 2,97,600	28,86,720 8,92,800
ii.	Consumables	4,00,000	3,00,000	3,00,000	10,00,000
iii.	Travel	2,50,000	2,50,000	2,50,000	7,50,000
iv.	Other Cost Analysis of Isotope and dissolved trace metal and REE analysis Secondary data collection	1,00,000 2,00,000	1,00,000 ---	1,00,000 ---	3,00,000 2,00,000
	Total Recurring	21,70,160	18,70,160	19,89,200	60,29,520
B.	Overhead	50,000	50,000	50,000	1,50,000
C.	Non-recurring				
i.	AWS HOBO (5 sensors)	20,87,000	---	---	20,87,000
ii.	Tough Book				
iii.	Discharge meter				
iv.	Water level recorders				
v.	Multi-parameter analyzer				
	Grand total A+B+C	43,07,160	19,20,160	20,39,200	82,66,520

IV. Doon University, Dehradun

Sl. No.	Item	Budget in Rupees			
		1 st Year 2021-22	2 nd Year 2022-23	3 rd Year 2023-24	Total
A.	Recurring				
i.	Manpower Junior Research Fellow (three) @ Rs.31,000/- + 16% HRA 1 st & 2 nd yr. and @ Rs. 35,000/- + 16% HRA p.m. for 3 rd yr. Technical Assistant/Field Assistant (one) @ Rs.20,000/- + 16% HRA p.m.	12,94,560 2,78,400	12,94,560 2,78,400	14,61,600 2,78,400	40,50,720 8,35,200
ii.	Consumables	5,00,000	5,00,000	5,00,000	15,00,000
iii.	Travel	1,50,000	1,50,000	1,50,000	4,50,000
iv.	Other Cost Chemical Analysis of samples.	2,00,000	2,00,000	2,00,000	6,00,000
	Total Recurring	24,22,960	24,22,960	25,90,000	74,35,920
B.	Overhead	50,000	50,000	50,000	1,50,000
C.	Non-recurring				
i.	Soxlet extractor standard(Buchi)	15,00,000	---	---	15,00,000
ii.	Air Sampler	3,23,000	---	---	3,23,000
	Grand total A+B+C	42,95,960	24,72,960	26,40,000	94,08,920

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V. CSIR-NGRI, Hyderabad


Sl. No.	Item	Budget in Rupees			
		1 st Year 2021-22	2 nd Year 2022-23	3 rd Year 2023-24	Total
A.	Recurring				
i.	Manpower Junior Research Fellow (one) @ Rs.31,000/- + 24 % HRA 1 st & 2 nd yr. and @ Rs. 35,000/- + 24% HRA p.m. for 3 rd yr.	4,61,280	4,61,280	5,20,800	14,43,360
ii.	Consumables	2,00,000	1,00,000	1,00,000	4,00,000
iii.	Travel	1,50,000	1,50,000	50,000	3,50,000
	Total Recurring	8,11,280	7,11,280	6,70,800	21,93,360
B.	Overhead	50,000	50,000	50,000	1,50,000
	Grand total A+B	8,61,280	7,61,280	7,20,800	23,43,360

VI. Veer Chandra Singh Garhwali Uttarakhand University of Horticulture & Forestry,
Bharsar, Garhwal

Sl. No.	Item	Budget in Rupees			
		1 st Year 2021-22	2 nd Year 2022-23	3 rd Year 2023-24	Total
A.	Recurring				
i.	Manpower Junior Research Fellow (one) @ Rs.31,000/- + 8% HRA 1 st & 2 nd yr. and @ Rs. 35,000/- + 8% HRA p.m. for 3 rd yr:	4,01,760	4,01,760	4,53,600	12,57,120
	Technical Assistant/Field Assistant (one) @ Rs.20,000/- + 8% HRA p.m.	2,59,200	2,59,200	2,59,200	7,77,600
ii.	Consumables	94,000	1,54,000	1,54,000	4,02,000
iii.	Travel	1,50,000	1,50,000	1,50,000	4,50,000
iv.	Other Cost Installation of weirs (for continuous discharge measurement)	1,00,000	---	---	1,00,000
	Total Recurring	10,04,960	9,64,960	10,16,800	29,86,720
B.	Overhead	50,000	50,000	50,000	1,50,000
	Grand total A+B	10,54,960	10,14,960	10,66,800	31,36,720

Components	1 st Year 2021-22	2 nd Year 2022-23	3 rd Year 2023-24	Total
University of Delhi, Delhi	1,20,56,280	60,87,280	61,04,880	2,42,48,440
IIT, Bombay	37,49,360	11,49,360	11,49,360	60,48,080
JNU, New Delhi	43,07,160	19,20,160	20,39,200	82,66,520
Doon University, Dehradun	42,95,960	24,72,960	26,40,000	94,08,920
NGRI, Hyderabad	8,61,280	7,61,280	7,20,800	23,43,360
VCSGUUHF, Bharsar, Garhwal	10,54,960	10,14,960	10,66,800	31,36,720
Total	2,63,25,000	1,34,06,000	1,37,21,040	5,34,52,040

2.4 Time Schedule: 03 Years (2021-22 to 2023-24).


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2.5 Description and proposed programme to be implemented by :

This project will be implemented by the PI as per details given below.

Task	1 st Year	2 nd Year	3 rd Year
Recruitment of Staff			
Purchase of instruments and equipment's			
Installation of weirs			
Collection of data			
Integration of results			
Publication of results			
Initiation of Phase-II			

3.0 The expenditure will be booked under the following Budget Head:


'3425'	Other Scientific Research (Major Head)
60.200	Assistance to Other Scientific Bodies (Minor Head)
52	Research Education and Training Outreach
52.00.31	Grant-in-Aid-General

4.0 Other Terms & Conditions:

- Allocation of budget is tentative and subject to changes after review of progress, both physical and financial as recommended by the Committee of Experts.
- **The grantee organisation will maintain separate audited account for the project and the entire amount of grant will be kept in an interest bearing bank account.** The interest earned / accrued should be reported to MoES (financial year wise) while submitting the Statement of Expenditure/Utilization Certificate. As per Rule 230(8) of GFR 2017, all interest or other earning against Grant-in-aid released to the grantee Institution should be mandatorily remitted to the Consolidated Fund of India immediately after finalization of the account. It should not be allowed to be adjusted against future release.
- A list of equipments procured and other assets created for this project from the funds released shall be provided to MoES in the prescribed format as per GFR. The ownership in the physical and intellectual assets created or acquired out of MoES funds shall vest in MoES.
- All equipments / assets procured out of MoES grant shall be maintained by the grantee institute and will be available for use by other researchers.
- All equipments / assets procured from MoES funded shall be maintained in the stock register of the grantee institute and should not treat such assets as their own assets in their Book of Accounts but should disclose their holding and using such assets in the Notes to Accounts specifically. No asset/equipment shall be diverted and /or disposed off without prior approval of the competent authority in MoES.
- Codal provisions as conveyed in GFR, manual on Policies and Procedures for purchase of Goods and GoI instructions issued from time to time for services and requisition of research personnel shall be ensured.


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- This sanction is subject to the condition that the grantee organization will furnish to the Ministry of Earth Sciences, financial year wise Utilization Certificate (UC) in the proforma prescribed as per GFR 2017, audited statement of expenditure (SE) along with up to date progress report at the end of each financial year duly reflecting the interest earned / accrued on the grants received under the project and DBT details of the manpower as per the enclosed performa.
 - Expenditure, Advance and Transfer (EAT) module of PFMS should be activated for the grants released under the project and expenditure under the project shall be monitored through EAT module.
 - While submitting Utilisation Certificate/Statement of Expenditure, the organisation has to ensure submission of supporting documentary evidences with regard to purchase of equipment/capital assets as per the provisions of GFR 2017. Subsequent release of grants under the project shall be considered only on receipt of the said documents.
 - The Position of project staff is co-terminus with the duration of the project & MoES would have no liability towards such manpower costs beyond the duration of the project.
 - Overhead expenses are meant for the host institute towards the cost for providing infrastructural facilities and benefits to the staff employed in the project, etc.
 - While implementing the programe all relevant procedures will be followed and the Ministry shall be apprised of the progress of the project from time to time.
 - The account of the grantee organisation shall be open to inspection by the sanctioning authority and audit (both by C&AG of India and Internal Audit by the Principal Accounts Office of the MoES), whenever the organisation is called upon to do so, as laid down under Rule 236(1) of General Financial Rules 2017.
- 5.0 This issues under powers delegated to this Ministry and with the concurrence of IFD vide their Dy. No. 88(R)/IFD/6108/2021-22/REACHOUT dated 16.06.2021 and with the approval of the Secretary, MoES vide Dy. No. 6108/Secy/2021 dated 17.06.2021.


21/6/2021
(Deen Dayal)

Under Secretary to the Govt. of India

To,

The Pay and Accounts Officer, Ministry of Earth Sciences, New Delhi-110003

Copy to:

1. The Principal Director of Audit (Scientific Department) AGCR Building, I.P. Estate, New Delhi 110002.
2. The Registrar, University of Delhi, Delhi-110007
3. Dr. Vimal Singh, Department of Geology, Chhatra Marg, University of Delhi, Delhi-110007
4. Dr.N.C.Pant and Dr. Pankaj Srivastava, Department of Geology, Chhatra Marg, University of Delhi, Delhi-110007

5. Dr. Dileep Kumar Singh and Prof. Neeta Sehgal, Department of Zoology, University of Delhi, Delhi – 110007
6. The Director, Indian Institute of Technology (IIT) Bombay, Powai, Mumbai- 400076
7. Prof. Malay Mukul, Department of Earth Sciences, IIT Bombay, Powai, Mumbai- 400076
8. The Registrar, Jawaharlal Nehru University, New Delhi-110067
9. Prof. A.L. Ramanathan, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi-110067
10. The Registrar, Doon University, Kedarpur, Dehradun, Uttarakhand-248001
11. Dr. Vijay Shridhar and Dr. Kusum, School of Environment and Natural Resources (SENR), Doon University, Kedarpur, Dehradun, Uttarakhand-248001
12. The Director, CSIR - National Geophysical Research Institute, Uppal Road, Hyderabad - 500007
13. Dr. Pavan Kumar Gayatri, CSIR - National Geophysical Research Institute, Uppal Road, Hyderabad - 500007
14. The Registrar, Veer Chandra Singh Garhwali Uttarakhand University of Horticulture & Forestry, Bharsar-246123, Pauri Garhwal (Uttarakhand)
15. Dr. S.P. Sati, Veer Chandra Singh Garhwali Uttarakhand University of Horticulture & Forestry, Bharsar-246123, Pauri Garhwal (Uttarakhand)
16. Cash Section, MoES, New Delhi.
17. Controller of Accounts, MoES.
18. JS&FA / JS / Sc. G (GRI) / Dir (F) / AD (OL) / IFD, MoES.
19. PPS to Secretary, MoES.
20. Sanction Folder/ File copy.


21/6/2021

(Deen Dayal)

Under Secretary to the Govt. of India