

ADMINISTRATIVE ORDER

Subject: Project entitled "Development of a predictive geomorphic model as a tool for sustainable river management".

- PI: Dr. Vikrant Jain, Associate Professor, Department of Earth Sciences, IIT Gandhinagar, Ahmedabad-382424.
Co.PI: Dr. Pranab Kumar Mohapatra, Associate Professor, D/o Civil Engineering, IIT Gandhinagar, Ahmedabad-382424.
Co.PI: Dr. Vimal Mishra, Associate Professor, D/o Civil Engineering, IIT Gandhinagar, Ahmedabad-382424.
Co.PI: Dr. Shashank Shekhar, Assistant Professor, Department of Geology, University of Delhi, Delhi-110007.

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 jointly by at an estimated cost of **Rs. 86,10,000/- (Rs. 60,73,200/- to IIT, Gandhinagar and Rs. 25,36,800/- to Delhi University, Delhi)** for a period of three years (2018-19 to 2020-21).

2.0 Objectives:

- To analyse hydrological connectivity between rainfall distribution, river discharge and groundwater in an anthropogenically disturbed system.
- To analyse geomorphic connectivity and its influence on river processes and morphology.
- To identify threshold condition at reach scale through appraisal of reach scale relationships between energy expenditure and geomorphic work.
- To identify threshold condition at site-scale through appraisal of within-reach energy expenditure and its relationship to channel processes and the formation of fluvial landforms at particular sites.
- Analysis of relationships between available energy, energy expenditure and fluvial forms and process across a range of scales and define sensitivity of change in response to external control.
- To integrate all data of threshold and connectivity at different scales for developing a process based geomorphic model.

2.1 Programme:

Future prediction of the landforms in response to external changes is a major scientific challenge because of nonlinear behavior of geomorphic systems. It has been recognized that understanding of nonlinear response of geomorphic system against external forcing is the basic requirement to develop a model for sustainable management of geomorphic system. Currently, little or no understanding exists about the projected future behaviour and form of rivers and other natural systems in India in the scenario of uncertainties associated with climate change and the ever growing impacts of anthropogenic effects. It will require in-depth process understanding in the conceptual framework of geomorphology. Geomorphic sensitivity, connectivity and threshold are such important conceptual parameters which can help to analyse nonlinear behavior of a geomorphic system.

Mishra Copy
S. Shashank Shekhar
Principal Investigator
MoES Project on
"Development of a
River Management"
Department of Geology
University of Delhi, Delhi-110007

Shastri
17.08.18
Contd. P-2

In this project, study is to be carried out in the Yamuna River, which has been significantly affected by anthropogenic disturbances. Pre-existing remote sensing data, Digital Elevation Model (DEM) data, stream power distribution profile; geomorphic classification map and hydrological data will be used. An attempt will be made to develop a new geomorphic model at short time scale to assess system responses to changes due to anthropogenic or natural factors (e.g. land use or climate change), and will be used as a tool in sustainable management of river systems. The project will establish a methodology which can be applied to any other river catchment.

2.2 Implementing Organization:

Indian Institute of Technology (IIT), Gandhinagar and University of Delhi would jointly be implementing this project.

2.3 Estimated Project Cost:

Total estimated cost of the project is **Rs. 86,10,000/- (Rs. 60,73,200/- to IIT, Gandhinagar and Rs. 25,36,800/- to Delhi University, Delhi)** during the period of three years (2018-19 to 2020-21). The year-wise / item-wise fund requirement is given below:

Component – I (IIT, Gandhinagar)

Sl. No.	Item	Budget in Rupees			Total
		1 st Year 2018-19	2 nd Year 2019-20	3 rd Year 2020-21	
A.	Recurring				
i.	Manpower Junior Research Fellow (one) @ Rs. 25,000 + 20% HRA p.m. for 1 st & 2 nd yr. and @ Rs. 28,000 + 20% HRA p.m. for 3 rd yr.	3,60,000/-	3,60,000/-	4,03,200/-	11,23,200/-
ii.	Consumables	1,00,000/-	1,00,000/-	1,00,000/-	3,00,000/-
iii.	Travel & Field work	1,00,000/-	1,50,000/-	1,50,000/-	4,00,000/-
iv.	Other Costs Minor GIS software, IMD data for rainfall, Channel cross section survey,	4,00,000/-	3,00,000/-	---	7,00,000/-
	Total Recurring	9,60,000/-	9,10,000/-	6,53,200/-	25,23,200/-
B.	Overhead	50,000/-	50,000/-	50,000/-	1,50,000/-
C.	Non-Recurring				
i.	Particle Shape Analyser (microscope with video camera)	34,00,000/-	--	--	34,00,000/-
ii.	Kinematic GPS receiver				
	Grand total A+B+C	44,10,000/-	9,60,000/-	7,03,200/-	60,73,200/-

Component – II (Delhi University)

Sl. No.	Item	Budget in Rupees			Total
		1 st Year 2018-19	2 nd Year 2019-20	3 rd Year 2020-21	
A.	Recurring				
i.	Manpower Junior Research Fellow (Two) @ Rs. 25,000 + 30% HRA p.m. for 1 st & 2 nd yr. and @ Rs. 28,000 + 30% HRA p.m. for 3 rd yr.	3,90,000/-	3,90,000/-	4,36,800/-	12,16,800/-

ii.	Consumables	50,000/-	50,000/-	50,000/-	1,50,000/-
iii.	Travel & Field work	50,000/-	1,00,000/-	1,00,000/-	2,50,000/-
	Total Recurring	4,90,000/-	5,40,000/-	5,86,800/-	16,16,800/-
B.	Overhead	40,000/-	40,000/-	40,000/-	1,20,000/-
C.	Non-Recurring Automatic digital water level recorder	8,00,000/-	--	--	8,00,000/-
	Grand total A+B+C	13,30,000/-	5,80,000/-	6,26,800/-	25,36,800/-

Component - I & Component -II	1 st Year 2018-19	2 nd Year 2019-20	3 rd Year 2020-21	Total
II.T. Ghandhinagar	44,10,000/-	9,60,000/-	7,03,200/-	60,73,200/-
Delhi University, Delhi	13,30,000/-	5,80,000/-	6,26,800/-	25,36,800/-
Grand Total	57,40,000/-	15,40,000/-	13,30,000/-	86,10,000/-

2.4 Time Schedule: 03 years (2018-19 to 2020-21).

2.5 Description and proposed programme to be implemented by :

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

Project Stage	Stage I	Stage II	Stage III	Stage IV
	1 st Year	2 nd Year	3 rd Year	3 rd Year
Project Management	██████████	██████████	██████████	██████████
JRF / Purchasing	██████████	██████████	██████████	██████████
Data Analysis	██████████	██████████	██████████	██████████
Field Work	██████████	██████████	██████████	██████████
Lab Work	██████████	██████████	██████████	██████████
Output	██████████	██████████	██████████	██████████
Communication	██████████	██████████	██████████	██████████

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

- 3425ⁱ 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
- 52.00.35 Grants for creation of Capital Assets

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. The interest thus earned will be treated as a credit to the grantee organisation, which will be adjusted towards future release of grant.

Contd. P-4

Prastava
17.0.18

- 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 Modes 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.
 - **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.**
 - 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 programme 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. 204/IFD/5703/2018-19/REACHOUT dated 27.07.2018 and with the approval of the Secretary, MoES vide Dy. No. 5703/Secy/18 dated 16.08.2018.


(Archana Srivastava)

Under Secretary to the Govt. of India

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

Contd. P-5

Copy to:

1. The Principal Director of Audit (Scientific Department) AGCR Building, I.P. Estate, New Delhi 110002.
2. The Director, Indian Institute of Technology (IIT), Gandhinagar – 382424.
3. Dr. Vikrant Jain, Associate Professor (Earth Sciences), Department of Earth Sciences, IIT Gandhinagar, Ahmedabad-382424.
4. Dr. Pranab Kumar Mohapatra, Associate Professor, Department of Civil Engineering, IIT Gandhinagar, Ahmedabad-382424.
5. Dr. Vimal Mishra, Associate Professor, Department of Civil Engineering, IIT Gandhinagar, Ahmedabad-382424.
6. Dr. Shashank Shekhar, Assistant Professor, Department of Geology, University of Delhi, Delhi-110007.
7. Cash Section, MoES, New Delhi.
8. Controller of Accounts, MoES.
9. AS&FA / JS / Sc. G (GRI) / Dir (F) / AD (OL) / IFD, MoES.
10. PPS to Secretary, MoES.
11. Sanction Folder/ File copy.

Archna Srivastava
17.8.18

(Archna Srivastava)
Under Secretary to the Govt. of India