

Ministry of Population and Environment (MoPE)
Department of Hydrology and Meteorology (DHM)
Community Based Flood and Glacial Lake Outburst Risk Reduction Project
CFGORRP/DHM

Terms of Reference

To analyze the existing sediment samples for developing into a knowledge product for wider dissemination

1. Background

Community Based Flood and Glacial Lake Outburst Risk Reduction Project (CFGORRP) is a joint undertaking of the Government of Nepal (GoN), Global Environment Facility (GEF) and the United Nations Development Programme (UNDP). The project is being implemented by the Department of Hydrology and Meteorology (DHM) under the Ministry of Population and Environment (MoPE) as the lead Implementing Agency. Department of Water Induced Disaster Prevention (DWIDP), Department of Soil Conservation and Watershed Management (DSCWM) and Department of National Park and Wildlife Conservation (DNPWC) are the three collaborating partners of the project.

The CFGORRP/DHM has two outcomes: The First Outcome / Component I focuses on the Imja Glacial Lake Outburst Flood (GLOF) risk reduction in Solukhumbu (covering Chaurikharka, Namche and Khumjung VDCs including high risk settlements covering an area of 50 downstream of Imja lake) and the Second Outcome / Component II is aimed at reducing the flood risk in Terai and Churia covering 8 Village Development Committees (VDCs) namely Sarpallo and Nainhi in Ratu (in Mahottari district), Tulsipur and Pipra Pra Pi in Gagan (in Siraha district), Dighawa and Pakari in Khando (in Saptari district) and Hadiya and Jogidaha in Triyuga Watersheds (in Udayapur district).

The project has four outputs under Component II, (a) Sediment control and stabilization of hazard-prone slopes & river banks through structural and non-structural mechanisms; (b) Flood Proofing of Water and Sanitation Systems in Selected VDCs in Target River Basins; (c) Institutionalization of flood risk management skills and knowledge; (d) Flood preparedness training for district and VDC representatives, NGOs, CBOs and local communities in 4 flood-prone districts.

2. Context

It has been well understood that Churia Originating Rivers are extremely flashy in nature and carry large amount of sediment from the hills and then deposits in the southern low land because of typical geological and terrain condition. Sediment transportation behaviors have now been dramatically changed due to impact of land-use/land-cover change and other interventions.

CFGORRP/DHM has published Sediment Monitoring Protocols for Churia Originating River Systems. The protocols aims to guide, define and standardize Trend Monitoring, Baseline Monitoring, Effectiveness Monitoring and Impact Assessment Monitoring. Based on the protocol, the Field Coordination Office (FCO) of CFGORRP/DHM has established a well-

equipped standard sediment processing laboratory at Lahan, Siraha. Suspended sediment samples are being collected in the laboratory by well-trained gauge readers (14 persons). The readers have adopted Depth Integrated sampling: Equal Incremental Method (EWI) method using standard wade sampler to collect the samples from project target five Rivers. The project has more than 200 samples of 3 years (2014-2016) suspended load sediment in terms of parts per million (ppm) as well as peak flow discharge of Ratu, Gagan and Khando rivers in 2016 and precipitation data of 2016 from 14 rain gauge stations to be analyzed

CFGORRP/DHM therefore intends to hire a service provider/consultant to analyze the existing sediment samples and come up with a knowledge product for wider dissemination.

3. Objectives of the Assignment

The main objective of the assignment is to analyze the suspended sediment samples collected at FCO and come up with a knowledge product for sharing for wider dissemination.

Specific objectives of the assignment include:

- Based on the review of existing available literature and use, select the most appropriate method for suspended sediment analysis of Churia Originating River System.
- Based on the analysis of the sediment and precipitation data, develop and frame the outcome of results into a knowledge product for national level sharing for wider dissemination.

4. Scope of Works

The scope of works include inter-alia, but not limited to the followings:

- Review the existing sediment Monitoring Protocols for Churia Originating River Systems prepared and published by CFGORRP/DHM.
- Undertake literature review of different appropriate tools/methodology/techniques of sediment analysis such as SWAT model, CCHE2D model, HEC-RAS or other relevant tool and based on the review, select the best one to suit the current study.
- Analyze the three year period (2014/2015/2016) sediment data collected at FCO, Lahan.
- Generate different types of results such as volume of sediment per year in each river, volume of sediment at different cross-section, formulate relations of the sediments pattern in upstream, mid-stream and downstream of the target river systems.
- Share the initial findings of the analysis to FCO team for inputs. Based on the inputs develop and frame the outcomes of the results into a knowledge product (in the form of an info-graphic poster or any suitable form) for sharing during a national consultative meeting for wider dissemination.
- Submit the database and the knowledge product to CFGORRP/DHM for further publication.

5. Geographical Coverage

Churia Originating River Systems: Ratu River (Mahottari), Gagan River (Siraha), Khando River (Saptari) and Hadiya and Kong rivers (Udayapur) are the base geographical area of study of sediment analysis.

6. Duration of the Assignment

The duration of this assignment is of one month including the submission of final deliverables and the tentative timeline as:

Timeline	Activities
2 weeks	Soliciting technical and financial proposal from service providers/ consultants
1 week	Review proposal and selection of service providers/consultants
1 week	Contract agreement with service provider/consultant
1 week	Submit a copy of inception report with work plan and timeline for delivery of output
2 weeks	Submit a copy of draft report for review and inputs
1 week	Submit a copy of final report after incorporating all comments and feedback received from the CFGORRP/DHM

7. Guidance and Supervision

The service provider/consultant will work under the overall guidance and supervision of the National Project Director (NPD) and National Project Manager (NPM) and in close consultation and coordination with District Project Coordinator, Field Coordination Office, Lahan.

8. Required Human Resources, Qualification and Experiences

Following human resources are required for the assignment.

Human Resource	Qualification and Experiences	Remarks
Sediment Analyst	A Ph.D. in hydrology, geology, watershed mgmt., river basin, water resources or a relevant field with a five years of working experience in the above field. Or a Master's degree in the above areas with 10 years of experience in similar field can also be considered.	The Consultant must have a good knowledge and understanding of the siltation issues from Churia originating rivers.

9. Deliverables

The contract will be deliverable-based and payment will be made after submission of the deliverables as specified in the contract agreement. The final deliverable comprises of an analyzed sediment database including the knowledge products in the form of an infographic or poster, and

- Submission of inception report with clear work plan and timeline,
- Submission of draft report analyzing the existing sediment samples for developing into a knowledge product for wider dissemination
- Submission of the final report.

Deliverable Table

Deliverables	Timeline	Payment	Remarks
Submit a copy of inception report with work plan and timeline for delivery of output.	Within 1 week after contract signing.	30% of the contract amount.	
Submit a copy of draft report for review and inputs.	Within 3 weeks.	40% of the contract amount.	
Submit a copy of final report after incorporating all comments and feedback received from the CFGORRP/DHM.	Within 4 weeks.	30% of the contract amount.	Submit report in soft copy.

10. Mode of Payment

The service provider shall be paid in three installments upon receipt of request:

- First Installment: 30% of the contract amount shall be paid upon signing of the contract and submission of inception report with tax invoice.
- Second Installment: 40% of contract amount shall be paid upon submission and acceptance of draft report with tax invoice.
- Third/Final Installment: 30% of the contract amount shall be paid upon submission and acceptance of final report with tax invoice.

11. Documents Required:

Following documents are required

- Technical proposal illustrating the work plan and timeline and financial proposal in separate sealed envelope.
- Copy of company registration (not applicable for individual)
- Copy of VAT registration certificates with recent tax clearance
- Organizational profile (if individual - Curriculum Vitae required)