

Terms of Reference (ToR)

for

**“Development of Inland River Flood Depth Index of Khutia
River of Kailali District of Sudurpaschim Province”**

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Closing date: 16 February 2023

Duration of the work: 24 February 2023 – 07 April 2023

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1. INTRODUCTION

Practical Action is a global change-making group that consists of a UK registered charity with community projects in Africa, Asia and Latin America, an independent publishing company and a technical consulting service. It combines these specialisms to multiply its impact and help shape a world that works better for everyone. In Nepal, Practical Action is focused on putting ingenious ideas into work to contribute to poverty reduction and sustainable wellbeing through working in three expertise change areas: **Energy that transforms; Farming that works** and **Resilience that protects**.

Practical Action has been working with Zurich Flood Resilience Alliance since 2013, a cross-sector global collaboration between Zurich Insurance groups, NGOs and academia and contributing to the alliance three overarching objectives: (i) increase funding for flood resilience (ii) strengthen policy at global, national or sub-national level to support flood resilience (iii) improve flood resilience practice.

Zurich Flood Resilience Programme, through its community programs and research initiatives, aims to generate evidence and relevant knowledge in understanding and achieving disaster resilience in Nepal. Since 2021 Index Based Flood Insurance (IBFI) is introduced in Lower Karnali as a risk transfer mechanism to help people to contain losses and recover in a timely manner leveraging the system of resilience (robustness, rapidity, resourcefulness, and redundancy). Practical Action, Global parametric, Shikhar Insurance company, Stonestep developed IBFI for lower Karnali got approval from Nepal Insurance Authority, for the pilot. In facilitation of project partners Shikhar insurance company rolled out the product in the monsoon of 2022. Cooperatives as the aggregator held the group policy on behalf of farmers. 12 cooperatives held 28 group policy reaching to 935 farmers in 2022. About 198 bigha of land with paddy cultivated was insured with a sum insured of approx. NPR 14254000. The flood hit second trigger for which payout to farmer was made is 25% of the sum insured amount which is approx NPR 3563500).

In our efforts to upscale the innovation learned from lower Karnali, in support from Tayar Nepal (Tayar Nepal is USAID's flagship disaster preparedness and response project for Nepal), for the project "Develop Innovative Approaches and Technologies for Disaster Risk Financing" Stone Step, Practical Action, Shikhar Insurance company, decided to replicate the IBFI in the Godawari Municipality of Kailali district covering risk of Khutia River which has a greater impact on agriculture system, through the project

This term of reference is published with an objective to call expertise agencies /individuals to conduct inland flood depth modelling and suggest scientific basis for the Index based flood Insurance structure considering the discharge of the Khutia River system covering the risk polygon of DHM in reference to Muri Bhaawar telemetry station.

2. BACKGROUND AND ISSUE

Riverine floods are caused due to the overflowing of rivers which cause inundation, soil degradation and often threatens lives and properties of flood exposed communities. The factors like climate change (such as heavy rainfall events) coupled with anthropogenic stressors (such as land use change, population growth), have increased the vulnerability of people and ecological system¹. Devastating flood occurs each year and makes Terai plains more

vulnerable with the number of deaths increasing as per the intensity of the flood and resulting in a high number of casualties.

The impact of the flooding and inundation in the lower Khutia River Watershed is extensive, including loss of lives, livelihoods, assets, and destruction of agricultural lands, etc. These impacts are expected to further intensify due to increasing trends of climate change. Recent survey across the area identified that more than 96% have experienced flood frequently where 57% mentioned that the flooding has affected their crop and crop land, 12% of surveyed mentioned that the flood washed away their fields, 10% have experienced that flood has caused some farming activity to be avoided. The survey shows that households on average lost approximate around NPR 25013 in the last monsoon due to flood on average in the area out of which around NPR: 20,000.00 was on paddy only.

3. OBJECTIVES

Analysis and structuring for the development of Index Based Flood Insurance product for the khutia River in Kailali district of Nepal. The indexes are to be developed using a methodology that combines exposure (economic assets, cropland) with local flood intensity (hazard) to produce an estimate of risk. Insurance structure should assess severe past flood risks and induced losses by severe floods, leading to potential future flood risks of damage on agriculture system. This should form the basis of potential severe flood triggers and associated pay-outs based on potential percent of damage by potential severe floods impact. The structure should be robust acceptable by the governments (DHM, Nepal Insurance Authority.)

Specific objectives:

- To create a river flooding index, based on the data from Global Flood Awareness System (GloFAS) or DHM or other authorized data system, create a model and validate with measured streamflow for extreme events with the highest impact and identify the events needing protection.
- Model the riverine and surface water depth from river induced floods. Construct the index using a methodology that combines exposure (assets) with local flood intensity (hazard) to produce an estimate of risk. For the calculation of the risk combine three key elements: the exposure, the event occurrence, and the event intensity at each asset location in Khutia River.
- Validate the flood index by comparing the GLOFAS daily streamflow with the measured streamflow stored in the DHM at Muri Bhaawar telemetry station of Khutia River.
- Using baseline survey data conducted by the project and in discussions with project stakeholders identify the approach to create a stepped payout product structure, as an index.

4. ELIGIBILITY AND TEAM COMPOSITION

- Comprehensive knowledge and understanding on integrated flood management tools and flood modelling purpose, stages, and techniques to establish flood index and pay-out structure for Climate and disaster risk insurance.
- Propose team within the frame of the given budget with at least a hydrologist in the team
- Knowledge and experience in flood depth modelling and develop risk map
- Comprehensive knowledge and expertise on flood mapping, layouts for dissemination of flood information, technical data requirement.

All the legally registered firm/company/agencies with proven track record on developing, conducting and analyzing flood risk mapping, are highly encouraged to apply. Below are the specific competencies that need to be highlighted in the proposal:

Apart from the above, submission of the following will be considered during the selection process:

- a. A brief technical and financial proposal along with budget breakdown (with timeline);
- b. A copy of Company Registration certificate;
- c. A copy of VAT certificate (obligatory); and
- d. A copy of tax clearance certificate for last fiscal year from Inland Revenue Office

5. RESULTS, DELIVERABLES and DUE DATES

The expected deliverables of the assignment are:

- Inception Report entailing the framework and methodology for flood risk modelling.
- Mid-term report – technical data considered for flood modelling and narration on process and product outputs elucidating different data sources and methods used.
- Final Draft Report with necessary flood maps, index set up, info graphs, and analyzed narration.
- Final report – with all the flood maps, index set up, info graphs and analyzed data in original file.
- Summary report with key recommendations for flood risk map applications.
- Final presentation in presentation format.

SN	Deliverables	Due Date
1	Inception Report entailing the framework or methodology for flood risk modelling -analysis and index structuring techniques for Index based flood Insurance.	1 week after award
2	Mid-term report – Flood risk modelling results with suggested index for Index based flood insurance. Narration on process and product outputs elucidating different data sources or methods used.	2 weeks after award
3	Final Draft Report with necessary Index and pay-out structure, info graphs, and analyzed narration.	4 weeks after award
4	Final report – with all the flood index and analyzed pay-out structure, info graphs and analyzed data in original file.	4-5 weeks after award
5	Final presentation in presentation format.	5-6 weeks after award

6. DURATION

The duration of this assignment will be approximately one and a half months. The consultant is expected to start work from 24 February 2023 and complete the assignment by 7 April 2023.

7. BUDGET

The total maximum budget available for this assignment is **NRS. 400,000.00** (In words: Four Hundred Thousand only) inclusive of all applicable taxes. This includes consultant's fee, lodging/accommodation, travel, stationaries and any relevant expenses involved in this assignment. *The budget is not subject to negotiation.*

All applicable taxes will be deducted at source. The release of funds will be made in three instalments: 30 percent upon completion of inception phase, 30 percent upon submission of mid-term report and remaining 40 percent after submission of final reports.

Practical Action Local partner will help the consultant in organizing ground truthing meetings in the field.

8. ROLES AND RESPONSIBILITY CONSULTANT

The main roles of the consultant shall be:

- Lead the overall process of data collection, analysis and report writing.
- Formulate flood modelling requirements and tools required.
- Collect data, process, Analyze and Finalize Index for the Index based flood insurance within the given timeframe after incorporating feedbacks given by the team.

PRACTICAL ACTION

The main responsibility of Practical Action Nepal Office is to:

- Orient consultant on the concept and objectives of the Index Based Flood Insurance and Index structure.
- Provide timely feedbacks and inputs.
- Release budget as per the agreement.

9. CONTACT AND COMMUNICATION

The reporting of this assignment is to the Senior Project Officer with a copy to Project Manager and thematic lead at Practical Action Nepal Office. In case of change of focal point, Practical Action will inform.

10. EVALUATION OF PROPOSAL

All received proposals shall be reviewed following criteria based on sound understanding of the assignment, competent methodology, consistency, coherence and compliance, experience of the consultant and proposed budget. All rights of approval of proposal remain with Practical Action and its decision will be considered final.

11. INVITATION OF PROPOSAL

Practical Action Nepal Office requests interested consulting firms (registered in VAT) to submit (i) letter of interest (1 page), (ii) a brief technical proposal and CVs of professionals to be involved in the assignment and (iii) a financial proposal with detail budget breakdown to conduct the proposed work to proposals@practicalaction.org.np on or before 16th February 2023 within 17:00 hrs with a title “**Flood modeling and index structure for Index based flood insurance**”.

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Practical Action believes in and follows fair and competitive process to recruit the consultant in all of its assignment to ensure quality assurance.

**BIG
CHANGE**
starts small