

## Terms of Reference (TOR)

For

### Information Communication Technology (ICT)/ Software Engineer for Resilient Infrastructure for Adaptation and Vulnerability Reduction (RIVER) Project

#### A. Introduction

Bangladesh is extremely vulnerable to the effects of climate change. The Global Climate Risk Index ranks Bangladesh as the world's seventh most affected country over the period 1999-2018. Rising temperatures leading to more intense and unpredictable rainfalls during the monsoon season and a higher probability of catastrophic cyclones are expected to result in increased tidal inundation. Besides, Bangladesh is also a deltaic country consisting of floodplains created by over 300 rivers and channels, including three major rivers: the Ganges, the Brahmaputra, and the Meghna. 25 percent of the country is less than 1m above sea level and 50 percent is less than 6m above sea level. Bangladesh is located at the foot of the highest mountain range in the world, the Himalayas, which is also the world's highest precipitation zone. During monsoon seasons, the winds from the sea towards the land raise the water levels in the Bay of Bengal, inhibiting drainage from these rivers to the sea. As rainfall is also high during monsoon seasons, river flows, local rain, and raised levels for the Bay of Bengal result in flooding of vast areas in Bangladesh. Floods are especially destructive when peak flows in these rivers occur at the same time.

Flooding in Bangladesh is a near-constant phenomenon, recurring with varying magnitude and intensity, affecting a greater population than any other natural hazard. Floods and riverbank erosion affect about one million people annually in Bangladesh. Once every three to five years, up to two-thirds of Bangladesh is inundated by floods. Runoff and peak 5-day rainfall intensity (a surrogate for an extreme storm event) are projected to increase. Such disasters have both direct effects (such as loss of lives and property) and indirect effects (such as loss of employment and income, reduced access to products and services, and the opportunity cost of resources that need to be diverted to relief and rehabilitation) as well as disrupting effects on rural economies, accelerating rapid urbanization and migration. Recent studies estimate that by 2050 Bangladesh could have 13.3 million internal climate migrants. Additional rural-urban migration would have significant consequences for air and water pollution and unsustainable consumption of natural resources while putting additional pressure on urban labor markets. Addressing climate risks is increasingly becoming urgent to ensure sustainable economic development of the country.

In the above backdrop, Resilient Infrastructure for Adaptation and Vulnerability Reduction (RIVER) Project aided by the World Bank with the project development objective (PDO) to reduce the vulnerability of people in targeted communities to riverine and flash floods, improve the country's capacity in disaster preparedness and response. The objective has been planned to achieve through the implementation of the following activities:

**I. Resilient Flood Shelters and Community Infrastructure:** This component will finance land raising and construction of climate-resilient flood shelters in targeted flood-prone villages in non-coastal districts, installation of lightning protection systems, construction and/or rehabilitation of associated climate resilient shelter connecting and community roads, and resilient infrastructure as identified by the community including climate resilient culverts and bridges, repair, rehabilitation of rural markets, repair and rehabilitation of landing stages (river jetties), and installation of solar powered street lights. The construction, repair and rehabilitation of infrastructure conducted under this component will implement energy efficient practices and equipment to reduce GHG emissions associated with the project activities. Additionally, where possible, the activities will use locally sourced material to reduce GHG emissions associated with transportation for procurement. This component will also cover the social and environment management in the proposed project intervention areas.

**II. Strengthening Capacity for Disaster Preparedness and Response and Technical Assistance:** This component will finance goods and services to increase the capacity of LGED and communities to plan, manage,

and recovery from floods, and strategic studies to increase long-term disaster and climate resilience. To enhance the capacity of LGED, these include setting up contingency planning for emergency preparedness and evacuations, updating the shelter database, improving the disaster loss and damage assessments and reporting system, and establishing Operation and Coordination Center (OCC) in Upazila, District and Regional level LGED offices as well as in HQ. Activities to enhance the capacity of communities include CBDRM activities with local organizations such as the Union Disaster Management Committees (UDMCs) on basic competencies to improve health and safety during floods, community risk mapping, training of School Management Committees (SMCs) on shelter management and updating and training on community operation and maintenance guidelines of shelters.

**III. Project Management, Design, and Supervision, Monitoring, and Evaluation:** This component will support the Government in implementing the project, and in coordinating all project related activities, monitoring, technical assistance, and training. It will include: (i) establishment of a Project Implementation Unit (PIU) within the Local Government Engineering Department, and consultancy and technical assistance for construction detailed design, procurement support, and construction supervision, preparation and implementation of safeguard instruments; (ii) capacity development of the PIU and communities in participatory planning and investment; (iii) monitoring and evaluation; and (iv) technical assistance and training in such areas as disaster management and preparedness, climate change adaptation and mitigation, construction, contract management, financial management, preparation of environmental and social assessments, and preparation of safeguard instruments. It will also provide resources for strengthening the flood preparedness and management program. The management, design and M&E activities under this component will integrate climate adaptation and mitigation measures and parameters.

**IV. Contingency Emergency Response:** The objective of this subcomponent is to cater to unforeseen emergency needs. In case of a major natural disaster, the Government may request the Bank to re-allocate project funds to this component (which presently carries a zero allocation) to support response and reconstruction. Disbursements under CERC will be contingent upon the fulfillment of the following conditions: (i) the Government of Bangladesh has determined that an eligible crisis or emergency has occurred and the Bank has agreed and notified the Government; (ii) the Ministry of Finance has prepared and adopted the Contingent Emergency Response (CER) Implementation Plan that is agreed with the Bank; and (iii) LGED has prepared, adopted, and disclosed safeguards instruments required as per Bank guidelines for all activities from the CER Implementation Plan for eligible financing under the CERC.

**Major** activities include 500 nos. Primary School cum Flood Shelters, 100 nos. Construction/Installation of Solar PV Nano-grid System, Raised land above Flood level 200 nos, Improvement of Flood Shelter Connecting Road- 275km, Construction of Bridges- 500 m, Construction of Culvert- 1330m, Improvement of community infrastructure Road- 110km, Solar Street Light- 6600 nos, Installation of Protection System- 1400nos.

The project is being implemented in 78 Upazilas of 14 Districts of Bangladesh. These 14 Districts are Kurigram, Lalmonirhat, Rangpur, Nilphamari, Gaibanda, Sirajganj, Pabna, Bogura, Gopalganj, Rajbari, Madaripur, Faridpur, Sunamgonj, Hobiganj

The Project Implementation Unit (PIU), LGED intends to hire a ICT consultant/ Software Engineer under Selection for Individual Consultant (with National, Open market approach) following World Bank Procurement Regulation July 2016 (Revised in November 2020) for services of firsthand technological support on planning, implementation, and coordination of Information and Communications Technology (ICT) related components of the project having package no. LGED/RIVER/21-22/IC-6. It will be financed by the World Bank

## B. Objectives

The main objectives of the Information and Communications Technology (ICT) Consultant/ Software Engineer (hereinafter referred as 'the Consultant') are to provide Project Director and PIU personnel with firsthand

Technological support on planning, implementation, and coordination of Information and Communications Technology (ICT) related components of the project.

### C. Scope of Services

The function of the position will be, but not necessarily limited to, the following:

- I. Coordinate in organizing the stakeholder consultations for the planned web-based ICT monitoring system in order to finalize the requirements analysis;
- II. Oversee the documentation of the overall development and operationalization process (e.g. SRS, SDD, Database design, User Manual);
- III. Support planning and development of the ICT monitoring system in continuation of the success of the systems in other projects of LGED;
- IV. Assist the teams in formulating policy needs subject to the rationality for technology adoption in the project;
- V. Oversee the procurement and installation of the hardware's and necessary software's along with supporting tools including domain, hosting;
- VI. Study, analyze and review existing business processes, systems, procedures, Field data management and result sharing procedures, result analysis of various component, interactive mapping and operations to identify scope of ICT intervention;
- VII. Analyze and identify potential area of integration along with integrating systems and agencies;
- VIII. Act as an intermediary in the cases of miscommunication or misconception between different teams to help ease up the decision making;
- IX. Manage data backup and systems restoration;
- X. Analyze any possible system requirements, further system enhancement inside the PIU and document the user requirement as well as the system requirements;
- XI. Prepare technical specifications for the procurement of necessary ICT hardware and Software's;
- XII. Prepare necessary documents including the system specification, design document, test plan, test cases, technical manual, training manual, training plan, user manual and so on, as required and suggested by the PIU;
- XIII. Respond to end user requests for hardware and software related technical assistances;
- XIV. Lead the setting up of ICT monitoring dashboards in PIU office and office of the Chief Engineer;
- XV. Monitor, maintain and oversee the ICT monitoring dashboards.
- XVI. The ICT Specialist may be asked to perform any other relevant duty or task as requested by the management.

### D. Duration

Duration of the consultancy services would be 48 Man-Months over the project period. The distribution of Month will depend on needs of the project. As such the consultant input will be intermittent. Requirement of services will be determined as per project requirement and written communication of the Project Director. The Contract may be extended based on project needs and subject to satisfactory performance.

### E. Qualification and Experience

- The Consultant should have bachelor's degree in computer science, Computer Engineering, Software Engineering, Information Technology (IT) or related field from a recognized university.

- Ten (10) years working experience on ICT technical field and should have trained in computer hardware and networking.
- 04 years working experience as Software Engineer/ICT Project Manager
- Proven experience in design, development, and implementation of Management Information System (MIS).
- Experience of working government projects especially involved in Software/ICT system development will be a plus.
- Ability to work with results-orientation and efficiency in a multi-tasking environment.
- Ability to communicate effectively and assist a range of non-technical users within the PIU.

**F. Reporting Requirement & Deliverables**

The consultant will submit the Inception report within 30 days of commencement and monthly report of assignment done & planning for next month. S/he will assist PD to ensure that related reporting is completed on time to enable the Project to meet the deadlines of various GOB authorities and the World Bank.

The Consultant is expected to submit the following reports, within the mentioned timeframe. The Consultant will submit hard copies and soft copies of the respective reports at each stage of the report for the specific interventions. The report format should be approved by the PD upfront.

Report Name	Timeframe
Monthly Progress Report	First week of every new month
Half Yearly Progress Report	6 Months
Annual Report	At the end of each year

**G. Institutional Arrangement:**

The consultants will work closely with the LGED’s Project Implementation Unit (PIU) and coordinate their work with other relevant units of LGED, Ministry of Local Government, local administration and relevant ministries and agencies.

Project Director would be designated as Head of the PIU to coordinate all interfaces with the Consultants. Head of PIU with support from the Chief Engineer would also assist the Consultants in resolving various administrative issues which may arise during implementation of the Contract. The Consultants shall be responsible for all aspects of performance of services as set forth in the preceding sections of this ToR

**H. Responsibilities of LGED**

The LGED will make experienced officials available and will ensure that the Consultant has access to all information required and documentation. The LGED will provide logistic support for the filed visits and will provide appropriate office space and other associated logistic facilities to carry out his/her roles and responsibility.

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