

TERMS OF REFERENCE (TOR)

FOR

**Individual Consultants
under**

**“চট্টগ্রাম জেলার মীরসরাই উপজেলার উন্নয়ন পরিকল্পনা প্রণয়ন ঃ সার্বিক দুর্যোগ ব্যবস্থাপনাকে
ভূমি ব্যবহারের মাধ্যমে সম্পূর্ণকরণ”**

**(Preparation of Development Plan for Mirsharai Upazila, Chittagong District:
Risk Sensitive Landuse Plan)**

URBAN DEVELOPMENT DIRECTORATE
Ministry of Housing and Public Works
Government of the People’s Republic of Bangladesh
November, 2016

Qualifications, Experience and Responsibility of Individual Consultants

A. Geologist– 1 Person (1x3 = 3 mm.)

Qualification: M. Sc. in Geology.

Experience: Extensive national experience in geological analysis and land use planning. The candidate must have 10 (ten) years working experience in geological land classification, hydro-geology, land use planning and administration of multidisciplinary team and training.

Responsibility: (i) To review both engineering and hydro-geological characteristics of **Mirsharai coastal region** to recommend policy guidelines and formulation of strategies for land use planning to develop tourist town at **Mirsharai**. (ii) To review Bangladesh National Building Code (BNBC) and synchronize the provisions made against seismic risk with the land use planning in Bangladesh and to make recommendation on seismic risk at **Mirsharai region**. (iii) To work in a team environment to synchronize the geological land classification and both engineering and hydro-geological data with other criteria of urban and regional planning to prepare plan for the region, (iv) Supervise and monitor the activities of Geological survey firm, which would be engaged by UDD for conducting earthquake hazard of **Mirsharai region**, (v) Review data, information and reports submitted by the Geological Survey firm and ensure the technical issues and quality of the work (vi) Any other related jobs assigned by PD.

B. GIS/RS Expert – 1 Person (1x3 = 3 mm.)

Qualification: M.Sc in Geography, Geo-informatics, GIS, Urban/Regional Planning, Information Technology or a relevant combination of education.

Core Competencies:

- Values/Guiding Principles;
- Performance Management;
- Developing People/Fostering Innovation and Empowerment
- Working in Teams;
- Communication information and ideas/Knowledge Sharing;
- Self-Management/Emotional Intelligence and Conflict management/Negotiating and resolving disagreements;
- Analytical and Strategic Thinking/Results Orientation/Commitment to Excellence.

Functional Competencies:

- Advocacy/Advancing a policy-oriented agenda;
- Innovation and marketing of new approaches;
- Job knowledge/Technical expertise;
- Organizational leadership and direction;
- Leveraging the resources of national governments

Experience: At least 8 years full time professional experience in relevant field. Advance knowledge in Mapping using GIS, remote sensing, relational database management and Geo-database modelling is essential is a must. Experience in planning and implementation of field mapping logistics as well as advance knowledge in the use of ERDAS Imagine, Imagine – Objective, ArcGIS 9, ArcSDE, ArcGIS server, SQL Server/Oracle, RTK GPS for gathering field

data in challenging work environments is essential. Experience in satellite image processing – expert classification/knowledge engineering/object-base image classification is desirable. Experience in technical capacity building or training is considered to be an asset. Excellent interpersonal and general communication skills

Responsibility: (i) Assist Project management with GIS analytical information (ii) Review mapping instructions/manuals for project (iii) Conduct GIS training for UDD staff and other relevant ministries (iv) Assist in the training of functionaries for the project planning and map interpretation. (v) Coordinate the systematic geo-coding, reproduction and archiving of administration boundaries, landuse planning maps within the established geodatabase schema. (vi) Evaluate the mapping and related work done by the project team and out-sourced team/company (vii) Ensure the quality of the map and related work. (viii) To work with a multi-disciplinary team environment to synchronize the multi-sectoral data into GIS database in formulating the Development Plan for **Mirsharai Upazila**.

C. Junior GIS/RS Expert– 1 Person (1x16=16 mm.)

Qualification: M.Sc in Geography, Geo-informatics, GIS, Urban/Regional Planning, Information Technology or a relevant combination of education

Experience: At least 05 years professional experience in relevant field. Advance knowledge in Mapping using GIS, remote sensing, relational database management and Geo-database modelling and experience in planning and implementation of field mapping logistics as well as use of, ArcGIS 9, ArcSDE, RTK GPS for gathering field data is essential.

Responsibility:

As **Junior** Expert assist the GIS Expert (i) To prepare topographic, physical feature, land use and other related map of the area, (ii) To prepare, supervise, manage and monitor digital database (Spatial and attribute) of the project. (iii) Installation and troubleshooting of GIS in UDD project office and head office; (iv) Ensure the quality of the map and related work. (v) To work with a multi-disciplinary team environment to synchronize the multi-sectoral data into GIS database. (vi) *Preparation of working paper, reports and plan of the project as assigned by the PD;* (vii) Any other related Jobs.

D. Urban Planner-1 persons (1x16=16mm)

Qualification: Bachelor of Urban and Rural/Regional Planning (BURP) with Master of Urban and Regional Planning (MURP) or equivalent.

Experience: 10 years working experience in Development planning particularly in urban environment.

Responsibility: (i) To prepare work program in consultation with Project Director; (ii) To coordinate among the survey team; (iii) To prepare work programme for the team; (iv) To compile report, working papers, sectoral studies and prepare report for submission to the PD; (v) *Preparation of working paper, reports and plan of the project as assigned by the PD;* (vi) To review the existing, plans and implementation problems; (vii) To prepare land use planning guidelines; (viii) To prepare land category for coastal region; (ix) To prepare land use matrix; (x) To identify and plan development project for the area; (xi) To interpret the recommendations of

sectoral studies into spatial form (xii) To formulate plan implementation strategy and policy; (xiii) To assist the UDD team members in preparing land use plan according to sectoral studies of the Structure Plan, (xiv) To be responsible for Knowledge transfer to Project Personnel and Preparation of working paper, study and survey reports and (xv) Any other related Jobs (xvi) Help PD and PMs in preparing plans and reports.

E. Infrastructural Engineer 1 Person (1*16=16 mm.)

Qualification: B.Sc. Engineering in civil

Experience: 5 years working experience in engineering and hydro geological survey and analysis.

Responsibility: (i) To work the geologist for conducting engineering and hydro-geological survey and analysis for the study; (ii) To assess the strength of road, buildings and other infrastructures to measure seismic vulnerability; (iii) To assist the geologist in conducting aquifer test for delineating the area for ground water harvesting; (iv) Any other related Jobs (v) Assist PD and PM in preparing plans and reports; (vi) To analyze land use and topographical survey results including infrastructure. (vii) Application of Building Codes assists in revision of existing development control rules. (viii) Make structural design and estimate cost for any engineering infrastructure suggested in development Plan (ix) To prepare relevant documents for quotation, tender etc for purchasing, recruitment etc guided by PD.

F. Geodesic Survey Expert:

Qualification: Diploma in Engineering Survey from recognized Institution.

Experience: 2 years working experience in engineering survey firm.

Responsibility: 1. To assist Urban Planner and Infrastructural Engineer for conducting Survey works. 2. Any other related Jobs assigned by Project Director.

G. Hydrologist – 1 Person (1x5 = 5 mm.)

Qualification: Master Degree in Civil Engineering/Water Resources Engineering.

Experience: 10 years experience in urban drainage master plan, flood risk management, experience in hydrodynamic analysis, river hydraulics and hydraulic and hydrology modeling.

Competencies

The incumbent should have sound knowledge of climate modelling and downscaling. He/she should have also sound knowledge and experience in flood forecasting modelling.

- He/she should be familiar with conventional and modern equipment and techniques for hydrological data collection, including up-to-date knowledge on remote sensing and data transmission technology.

- The candidate should have good understanding of developments in international flood hydrometric modelling and experience of River hydraulic.
- The candidate should have good understanding of developments in international flood hydrodynamic modelling and experience of River hydraulic and hydrological modelling; Flood risk assessment; integrated river basin modelling and management. Experience of hydraulic modelling software (e.g. Mike Flood, PCSWMM Professional 2D, HEC RAS, TUFLOW, Flo2D)

Responsibility:

- Compare and test the co-relations of local rainfall with flood, upstream basin rainfall with flow/flood and River level or flow with flood. The observed flood of the area and rainfall data is important to analyze the correlation between the rainfall with different category of flood and cause local submergence.
 - Assess the City's existing storm water management programs, operations and maintenance practices, inventory, asset management, on-going monitoring, capital and operational budgeting and other related expenditures.
 - Prepare a GIS Based drainage inventory. The projection system of the area should be followed by the local datum of BTM
 - Take into account climate change issues. This task should include, but not be limited to: Climate change issues should be used for the rainfall analysis. In this regard, climate change modeling and downscaling will be prepared for predicting of the future flooding scenario.
 - Rainfall analysis should be considered in both of peak intensity and high volume of storm water.
 - Delineate the sub-catchment area with natural flow network.
 - Calculate flows and peak discharge from each catchment area and assess the capacity of the existing watercourses/channels which are capable of containing calculated flows from extreme rainfall periods.
 - Integrate Hydrological model, hydrodynamic model and hydraulics model
 - Prepare flood hazard map in both of hydrological and hydrodynamic aspect in different return period.
 - Identify the possible ponding area, and depth, extent as well as distribution of flood with different return period.
 - Assess the existing performance of retention pond with different return period.
 - Prepare a drainage layout plan for the study area
 - Provide recommendations for interventions in the drainage systems
 - Prioritize for short (< 1 yr) medium (1 -2 yrs) and long-term (> 2 yrs) interventions
 - Identify responsibilities and recommend effective policy and institutional arrangement for implementation of plan
 - Identify of areas at risk and adaptation measures
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- Recommend and inform the design of the drainage systems for specific areas
 - Provide recommendations for enhancement of functionality and develop a maintenance regime of existing and/or recommended retention ponds

H. Associate hydrologist expert -1 persons (1x5=5mm)

- **Qualification:** Bachelor degree in Urban and Rural/Regional Planning/ Water Resources Engineering/ Water Resources Management or related Discipline
- **Experience:** At least 6 years' experience on urban drainage master plan, flood risk management, experience in hydrodynamic analysis, river hydraulics and hydraulic and hydrology modelling
- **Competencies**
 - The incumbent should have sound knowledge of climate modelling and downscaling. He/she should have also sound knowledge and experience in flood forecasting modelling.
 - He/she should be familiar with conventional and modern equipment and techniques for hydrological data collection, including up-to-date knowledge on remote sensing and data transmission technology.
 - The candidate should have good understanding of developments in international flood hydrometric modelling and experience of River hydraulic.
 - The candidate should have good understanding of developments in international flood hydrodynamic modelling and experience of River hydraulic and hydrological modelling; Flood risk assessment; integrated river basin modelling and management. Experience of hydraulic modelling software (e.g. Mike Flood, PCSWMM Professional 2D, HEC RAS, TUFLOW, Flo2D)

Responsibility:

Assist the hydrologist for the following purposes:

- Compare and test the co-relations of local rainfall with flood, upstream basin rainfall with flow/flood and River level or flow with flood. The observed flood of the area and rainfall data is important to analyze the correlation between the rainfall with different category of flood and cause local submergence.
- Assess the City's existing storm water management programs, operations and maintenance practices, inventory, asset management, on-going monitoring, capital and operational budgeting and other related expenditures.
- Prepare a GIS Based drainage inventory. The projection system of the area should be followed by the local datum of BTM
- Take into account climate change issues. This task should include, but not be limited to: Climate change issues should be used for the rainfall analysis. In this regard, climate change modeling and downscaling will be prepared for predicting of the future flooding scenario.
- Rainfall analysis should be considered in both of peak intensity and high volume of storm water.
- Delineate the sub-catchment area with natural flow network.
- Calculate flows and peak discharge from each catchment area and assess the capacity of the existing watercourses/channels which are capable of containing calculated flows from extreme rainfall periods.
- Integrate Hydrological model, hydrodynamic model and hydraulics model
- Prepare flood hazard map in both of hydrological and hydrodynamic aspect in different return period.
- Identify the possible ponding area, and depth, extent as well as distribution of flood with different return period.
- Assess the existing performance of retention pond with different return period.
- Prepare a drainage layout plan for the study area

- Provide recommendations for interventions in the drainage systems
- Prioritize for short (< 1 yr) medium (1 -2 yrs) and long-term (> 2 yrs) interventions
- Identify responsibilities and recommend effective policy and institutional arrangement for implementation of plan
- Identify of areas at risk and adaptation measures
- Recommend and inform the design of the drainage systems for specific areas
- Provide recommendations for enhancement of functionality and develop a maintenance regime of existing and/or recommended retention ponds