

Terms of Reference

Landslide Stabilization to Safeguard Civil Population and Infrastructure of Muzaffarabad City – AJ&K

Background

The state of Azad Jammu and Kashmir (AJ&K) is a landlocked area situated in the foothills of lower Himalayas. On the western side of State's boundary, the provinces of KPK and Punjab are located; while the entire south-eastern boundary is flanked by the Indian Occupied Jammu and Kashmir. The total land area comprises of 13,297 km² and administratively is divided into ten districts. The AJK's river / stream run-off are mostly influenced by two distinct weather patterns. In winters, the westerly disturbances deposit heavy loads of snow melting in early springs and contributes in the major load towards the run-off. In summers, the easterly disturbances often cited as Monsoon causes considerable increase in the surface flows. The stream flows, in the upper Northern Districts are mostly influenced by spring snow melt, while in the lower reaches of Northern Districts and Southern Districts, summer Monsoons are the major contributors. The fragile ecosystem and geological formations are very prone to rainfalls water and landslides are common feature in the area. It has been further aggravated by the earthquake of October 2005, during which the mountains were shaken deep and wide cracks were developed and slopes became further prone to landslides. These landslides are permanent threat to the agricultural land, habitations, infrastructure and human lives.

The serious threat of such landslides is in the capital city Muzaffarabad which is surrounded by mountains all around and is situated right on the fault line. Whenever there are heavy rainfalls the debris flows down into the streams and water overflows into streets and houses along with debris. Due to dense population in the capital city the risk of damage is more than the rural areas and value of losses is also higher.

So it is very necessary to minimize these risks by treating the water catchment areas and constructing control structures in the streams and protective structure at vulnerable sites. For this purpose a detail study is required for effective planning and implementation.

Objective

- Survey the area around capital city of Muzaffarabad to assess and map the risk of landslides and debris flow which causes damage to the habitation and infrastructure.
- Identification of causes of landslides and debris flow.
- Propose mitigation measures, prepare design, assess the quantity and estimate cost of construction and treatment to make the city safe against disaster.
- Provide technical assistance for landslide stabilization mitigation measures.

Scope of Work

The tasks and responsibilities of the Consultant includes, but not limited to the following:

Task I: *Inception meeting, preparation of methodology, work-plan and table of contents.*

This task will include:

Conduct inception meeting(s) of the Consultant with the management of Forest Department GoAJ&K and any other relevant to the assignment to (i) review the process for the conduct of the study, (ii) identify preliminary background information related to the study, and (iii) finalize the methodology, work-plan and draft table of contents for the study.

Task II: *Geological stability & hydro-geological studies for mapping of areas vulnerable to landslides*

- Conduct field trips to the study area to carry out detailed field surveys for detailed geological stability study of landslide areas
 - Assess the strength of geological materials by conducting necessary field and laboratory tests and analysis;
 - Conduct slope stability analysis of soil and rock slopes to: find out depth and configuration of the failures
- Mapping of watershed areas around the capital city indicating its hydro-geology, hydrology, downstream hazard assessment including flood modeling, different land uses and streams and gullies which drain in and around the city, landslides, debris flow and destabilized slopes.
Identification of vulnerable areas & its mapping
- Get high resolution satellite based temporal data from land use planning section or/and purchase additional high resolution satellite based temporal data sheets, as required
- Process the satellite based data in computer programs like Arc GIS and AutoCAD
- Ground-truth of maps, other information and data generated through satellite based datasheets
- Identification of dangerous sites which are landslide and produce debris during the rainfalls into streams and gullies.
- Assessment of vulnerable areas threatened by floods, debris flow and other related hazards.
- Prepare instability inventory maps and engineering geological maps for landslides, erosion, debris flow, rock fall, planer and wedge failures etc. of the study area
- Identify, assess and mark on maps all water bodies (springs, annual and perennial streams, river etc.) that have been impacted in the study area

Task III: Identification of causes of instability

- Assess correlations between instabilities and geology, topography, land use, hydrology and
- Determine the most significant factors that are responsible for causing the instabilities

Task IV: Design and cost estimates of mitigation measures, preparation of landslide stabilization strategy and plan of areas in and around capital city

- Detailed review and assessment of previous reports, maps, drawings, inventories and construction work conducted by AJ&K's different institutions/projects like State Earthquake Reconstruction and Rehabilitation Agency (SERRA), UNDP, FERRP and Forest Department AJ&K
- Identify and prepare proposals of site specific appropriate recommendations and mitigation measures to be adopted for landslide stabilization and flood protection and assessment of quantities.
- Provide detailed designs and cost estimations of proposed mitigation measures including type and dimensions of engineering, bio-technical, bio-engineering and other green and innovative design and technologies wherever appropriate
- Prepare Environmental and Social Safeguards Strategy & Plans for proposed sites of land stabilization as per the requirements and guidelines of World Bank and AJK Environment Protection Agency
- Obtain clearance of Environmental Protection Agency for the planned construction work of landslide stabilization and debris flow, wherever necessary
- Suggest/recommend the involvement of local communities, wherever necessary
- Suggest/recommend post construction maintenance measures for long-term sustenance of the structures
- Prepare landslide stabilization strategy and plan

Task V: Technical assistance for landslide stabilization mitigation measures

- Provide technical assistance for landslides/slopes stabilization mitigation/ corrective measures being conducted by different organizations/ projects in AJ&K.

Coordination:

The consulting firm will report to the Project Director, DCRIP and Chief Conservative Forest Department GoAJ&K or any other staff designated by PD DCRIP. All work must be approved by the Project Director or the designated staff.

Qualifications:

The interested consultants shall be a tax registered national management or Engineering related or special hazard and risk assessment consultancy firm or an international management consultancy firm incorporated for at least five (5) years for offering similar services and have completed similar projects of this scale and complexity and in comparable organizations. Consulting firm should possess good knowledge of the

working of the Government of AJK, as well as of all concepts, principles and approaches required for the assignment. In case of joint venture, the details of such projects will be provided separately as primary or associated consultant. Consulting firm should propose adequate approach, methodology & work plan for timely and effective completion of assignment. The submitted proposal must have the validity of 90 days. Evaluation criteria for short listing will base on following marking criteria.

- a. General Experience (The consultant should have completed at least Five (05) similar sizes of projects of the same scale and/or complexity and in comparable organizations to judge capacity and performance of the firm. (Marks 30 points)
- b. Relevant Experience: The consultant should have completed at least Four (04) similar project of the same scale and/or complexity and in comparable organizations. Experience of working with Government of AJK. Specific experience includes General hydraulic studies, watershed management and other flood mitigation structure, and Related Project). The firm should have and demonstrate necessary experience and capacity of preparing environmental and social safeguards strategy & plans as per the requirements and guidelines of the World Bank and AJK Environment Protection Agency (EPA). The firm should have a team having expertise of more than eight years in the following areas: Civil, Geotechnical Engineering, Hydrology/ Geo-hydrology, Structural design, Watershed management, Bio-engineering, Surveying, Quantity surveying, Technical drawing, Environmental Impact Assessment, GIS and remote sensing. The team leader should have expertise of Geo-technical and bio-engineering who will be responsible for management and coordination of all project activities. (Marks 40 Points)
- c. Management Capacity (Volume / number of consultant's services in terms of total number of relevant staff (as mentioned in point b above) months executed in the assignment, as their specific input should be sufficient to indicate that the firm would be able to handle the requirements of this assignment. (Marks 30 Points).

Interested consulting firm(s)/ Joint Venture(s) must provide information indicating that they are qualified to perform above services (e.g. descriptions of similar assignments, value of previous assignments, experience under similar conditions,), along with the documentary evidence which include contract agreement, copy of the final deliverable or any other legal document.

Affidavit from all the participating Firm(s)/partners of the association confirming that: (a) applicant firm(s)/ joint venture(s) have never been blacklisted by any International, Government/ Semi Government Organization and (b) All the information provided by the applicant firm(s)/ joint venture(s) is correct.

Deliverables:

- Report of Inception meeting(s) containing methodology, work plan and table of contents
- Geological stability study report of the area
- Report of mapping of watershed areas, areas indicating different land uses with description of catchment areas, habitations, streams and gullies with estimation of annual flows (flow duration curves) and sedimentation
- Identification of sites and GIS based maps of areas vulnerable to landslides, debris flow and sediments producing sites
- Report of causes of instability
- Identification, designing and cost estimation of site specific mitigation measures
- Landslide stabilization strategy and plan of areas in and around capital city
- Report of technical assistance provided to different projects in AJK for landslide stabilization mitigation measures
- All outputs (hard and soft copy) that would be produced under study will be provided to PIU DCRIP, P&DD Government of AJ&K for dissemination to concerned stakeholders.
- Environmental and Social Safeguards Strategy & Plan for the proposed sites for landslide stabilization.

Period of Contract

The overall period of contract will be eight months.

TIMELINES FOR DELIVERABLES

| S. No. | Deliverables | Timelines |
|---------------|---|---|
| 1 | Inception report containing methodology and work plan & table of contents of final report | Four (4) week after signing the contract |
| 2 | Assessment of methodology and work plan | Eight (8) weeks after signing the contract |
| 3 | Mapping of land uses & watershed areas and report of geological stability | Fourteen (14) weeks after signing the contract |
| 4 | Identification hazardous and vulnerable sites | Twenty (20) weeks after signing the contract |
| 5 | GIS based maps of vulnerable areas & report of causes of instability. | Twenty four (24) weeks after signing the contract |

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| 6 | Recommendations and Guidelines for mitigation measures at hazardous and vulnerable sites | Twenty six (26) weeks after signing the contract |
| 7 | Estimation of site specific measures with design, quantity and cost | Twenty eight (28) weeks after signing the contract |
| 8 | Landslide stabilization strategy and plan including Environmental and Social Safeguards strategy & plan | Thirty (30) weeks after signing the contract |
| 9 | Report regarding technical assistance for landslide stabilization mitigation measures being conducted by different organization/ projects in AJ&K | Thirty one (31) weeks after signing the contract |
| 10 | Submission of final report (soft and hard format with at least 100 copies on 120 gram glassing paper) | Thirty two (32) weeks after signing the contract |

Indicative Payment Structure:

The ‘Consultant’ will be paid the lump-sum amount for undertaking the assignment according to the submission and client’s approval of deliverables. All other costs would be considered included in the lump-sum costs and all applicable taxes will be deducted at the time of payment.

| S. No | Benchmark | Payment |
|-------|--|---------|
| 1. | Mobilization Advance upon signing of contract (against bank guarantee) | 10% |
| 2. | Upon acceptance of Inception report | 10% |
| 3. | Upon acceptance of Deliverable 3 | 10% |
| 4. | Upon acceptance of Deliverable 4 | 15% |
| 5. | Upon acceptance of Deliverable 5 | 15% |
| 6. | Upon acceptance of Deliverable 6 | 10% |
| 7. | Upon acceptance of Deliverable 7 | 5% |
| 8. | Upon acceptance of Deliverable 8 | 10% |
| 9 | Upon acceptance of Deliverable 9 | 5% |
| 10 | Upon acceptance of Deliverable 10 | 10% |

Selection Process

Procurement will be based on Consultants Qualification (CQS) method in accordance with paragraph 3.7 of World Bank’s Guidelines: Selection and Employment of Consultants [under IBRD Loans and IDA Credits & Grants] by World Bank Borrowers (January 2011 and Revised in 2014)