



**PUNJAB IRRIGATION DEPARTMENT  
GOVERNMENT OF THE PUNJAB  
CHIEF ENGINEER, IRRIGATION LAHORE ZONE, LAHORE**

**FEASIBILITY STUDY FOR COMPREHENSIVE INTEGRATED FLOOD  
MANAGEMENT OF NULLAHS IN DISTRICT SIALKOT, NAROWAL  
AND GUJRANWALA**

**TERMS OF REFERENCE (TOR)  
PROCUREMENT OF STEREO SATELLITE IMAGERY AND  
DIGITAL ELEVATION MODEL (DEM)**

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**Feasibility Study for Comprehensive Integrated Flood Management  
of Nullahs in District Sialkot, Narowal and Gujranwala**

**TERMS OF REFERENCE (TOR)  
PROCUREMENT OF STEREO SATELLITE IMAGERY AND DIGITAL  
ELEVATION MODEL (DEM)**

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## **Terms of Reference (TOR)**

### **Procurement of Stereo Satellite Imagery and Digital Elevation Model (DEM)**

#### **1. OBJECTIVE OF THE ASSIGNMENT**

The objective of this assignment is to procure, process, and deliver high-quality Digital latest archive optical stereo satellite imagery, Digital Elevation Model (DEM) and Digital Surface Model (DSM) to support a feasibility study for comprehensive integrated flood management of nullahs in the districts of Sialkot, Narowal, and Gujranwala.

The acquired datasets shall provide reliable elevation and surface information for hydrological, hydraulic, and flood modeling applications

#### **2. SCOPE OF WORK**

The selected firm/vendor shall be responsible for the following:

- Procurement of latest archive stereo satellite imagery of 5-meter resolution covering the complete Area of Interest (AOI).
- Generation of 5-meter resolution DEM from stereo satellite imagery.
- Generation of 5-meter resolution DSM from stereo satellite imagery.
- Processing, quality control, and validation of elevation datasets.
- Delivery of geo-referenced, GIS-ready datasets in approved formats.
- Provision of metadata, accuracy reports, and documentation.

All works shall comply with the technical specifications provided in this TOR.

#### **3. STUDY AREA**

The total Area of Interest (AOI) is approximately: 6,120 square kilometers

The AOI covers nullahs and associated catchments located within:

- District Sialkot
- District Narowal
- District Gujranwala

#### **4. DATA ACQUISITION SPECIFICATIONS**

##### **4.1 Optical Stereo Satellite Imagery**

The firm shall procure optical stereo satellite imagery meeting the following minimum specifications:

- Ground Sample Distance (GSD): 5-meter
- Data source:
  - Archive image (most recent)
- Minimum off-nadir viewing angle: 20°
- Cloud cover: < 5%
- Spectral configuration:
  - Panchromatic band
  - Multispectral bands

- Stereo bundle format
- Radiometric resolution: 16-bit or higher per pixel
- Delivery of raw imagery with RPC files and proof of procurement from the satellite operator

## 5. DELIVERABLES

The Consultant shall provide the following:

### 1. Ortho-rectified Imagery

- Satellite imagery (5-meter resolution) in TIFF/GeoTIFF
- QA/QC report for ortho-rectification (RMS errors, coverage completeness, artifacts)
- Metadata (acquisition date, sensor info, projection, coordinate system)

### 2. DEM

- 5-meter resolution DEM (Stereo) in TIFF/GeoTIFF
- Accuracy report (vertical accuracy, RMSE)

### 3. DSM

- 5-meter resolution DSM (Stereo) in TIFF/GeoTIFF
- Accuracy report (vertical accuracy, RMSE)

### 4. Raw Data

- Satellite imagery with RPC files

## 6. COORDINATE REFERENCE SYSTEM

- Coordinate Reference System:
  - Projection: Universal Transverse Mercator (UTM, relevant zone)
  - Datum: WGS-84
  - Units: Meter (horizontal and vertical)

**Note:** All soft data, including processed and raw datasets, reports, and GIS-ready files, shall be provided on a USB drive or external hard disk.

## 7. QUALITY ASSURANCE

- All works shall comply with applicable standards, specifications, and project requirements.
- Deliverables shall be subject to review and approval by the Client and the Engineer-in-Charge.
- All activities must be completed to the full satisfaction of the Client.