

3.2 Assessments of Waterlogging/Flood Prone Settlements

3.2.1 Data Requirements

1. Elevation data
2. Waterbodies/ Rivers
3. Past Flood data with location
4. High Flood Line for rivers

3.2.2 Stepwise Process Flow Details

- Step 1: Import Data
 - o Open QGIS and load your Digital Elevation Model (DEM) data representing the topography of the study area.
 - o Import building data and any other relevant spatial data layers, such as rivers, flood-prone areas, and historical flood level data, if available.
- Step 2: Clip the Digital Elevation Model
 - o Use the "Clip raster by extent" tool to clip the DEM to your study region. This tool can be found in the Processing Toolbox (Processing > Toolbox) under the GDAL > Raster extraction menu.
- Step 3: Reclassify the DEM
 - o Utilize the "Reclassify by table" tool in the Processing Toolbox (Processing > Toolbox) under the SAGA > Raster tools menu.
 - o In the tool dialog, select the clipped DEM as the input raster, and define your flood threshold values in a reclassification table (e.g., set values less than the High Flood Line (HFL) to 1 and the rest to 0).
- Step 4: Identify Flood-Prone Areas
 - o After reclassifying the DEM, the resulting raster image will represent potential flood-prone areas, where cells with a value of 1 are susceptible to flooding.
- Step 5: Use Historical Flood Levels (if available)
 - o If you have access to historical flood level data, repeat Steps 2 and 3 with this data to create an additional raster representing historical flood-prone areas.

- Step 6: Overlay Buildings
 - o Add the building data to QGIS and ensure it aligns correctly with the other layers.
 - o Use the "Intersect" tool in the Processing Toolbox (Vector overlay > Intersection) to overlay the buildings layer with the flood-prone areas layer. This will help identify buildings falling within the flood-prone regions.

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Figure 8 Illustrations of identifying of water logging prone settlements, Sherpur (Bangladesh)

Source - CWIS spatial analysis, Innpact Solutions and GWSC

3.2.3 Output Application

Areas with waterlogging risks present operational challenges for the smooth functioning of toilet units. These challenges include toilet back-flow and non-functional soak pits. Understanding such risk areas may aid in understanding such risk hot spots on at city scale and integrating them with building bye-laws could also assist in the development of an appropriate monitoring framework.

Revision #1

Created 3 March 2025 04:18:10 by Bookstack Editor

Updated 3 March 2025 04:18:50 by Bookstack Editor