

Geo-Spatial Multi-Criteria Analysis of the Downstream Flood Risk Settlements of Usman Dam Abuja-Nigeria

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Key words: Access to land; Coastal Zone Management; Geoinformation/GI; GIM; Informal settlements; Land management; Positioning; Risk management; Spatial planning; Urban renewal

SUMMARY

Flooding is a worrisome phenomenon especially in recent decades due to its effect on human life and man's environment. This study thus mapped and analysed flood risk settlements in the downstream of Usman dam in Abuja, Nigeria, using geospatial techniques. Spatial data were captured which included positional coordinates, Landsat enhanced thematic mapper (ETM), soil map, and shuttle radar topographic mission (SRTM). The factors of flooding and their effect on the area under study were identified. The results of the study revealed based on the criteria weights that, slope (0.24) and elevation (0.24) were the most important factors contributing to flooding in the study area followed by drainage proximity (0.16), land use land cover (LULC)(0.12), and soil (0.08), respectively. The results also showed that, the built-up area, farmland, forest, grassland, rock outcrop and water body covered about 278.0 km², 306.9 km², 1406.6 km², 1635.8 km², 387.5 km² and 386.9 km², respectively of the study area. Moreover, it was found out that 6.41% of the settlements were located in the highly vulnerable areas, while 64.02% were located within the areas moderately vulnerable to flooding. However, the remaining 29.57% were located in the low vulnerable areas. It was suggested based on the results of the study that settlements close to the river course and dam reservoir, and along the flood plains should be relocated to the low vulnerable areas (eastern parts of the study area) in order to prevent future flood hazard.

Keywords: Environment, Flood Risk Management, Geo-spatial Mapping, Hazard, Multi-criteria Analysis

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FIG Working Week 2020
Smart surveyors for land and water management
Amsterdam, the Netherlands, 10–14 May 2020