

Geospatial Analysis of River Inundation and Flood Risk Levels in Ajeokuta Using Remote Sensing and GIS

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Key words: Remote sensing; Risk management; Spatial planning

SUMMARY

Heavy floods in Nigeria have shown increasing trend in recent years. Ajeokuta is one of the areas affected annually by flood due to its location along the river Niger basin. Flood risk mapping and analysis are vital elements for appropriate land use planning in flood prone areas.

The aim of this paper is to demarcate flood risk potential areas and determine the spatial impact of the recent major flood event in Ajeokuta using Remote Sensing and GIS techniques. Identified flood inducing factors in the study area, such as slope, elevation, drainage density, proximity to the river and land use were reclassified and combined to delineate flood risk zones using multi-criteria approach in a GIS environment. The idea was to identify the areas with the highest number of flood inducing factors and assess its proximity to the inundated areas during the recent flood events as a criteria for determination of locations for future flood events. Moderate resolution imaging spectroradiometre (MODIS) data of NASA terra satellite, SRTM, Landsat image with resolution of 30m, geographical map of the study area and geographical information system (GIS) were used for this purpose. Each of the flood indicators was reclassified into four which included high risk, moderately risk, low risk, and no risk through ranking process. Flood risk map (FRM) was later generated by overlaying the reclassified maps of all the parameters using addition operator and validated with a view to assisting decision makers on the menace posed by the disaster. The flood risk map revealed that the very high risky places covered area of 376.31 square kilometers (27.63%) while high risky covered 322.88 square kilometers (23.71%), The low risky areas covered 151.76 square kilometers (11.14%) and areas free from risk covers 511.040 square kilometers (37.52%). This analysis further revealed that 56 settlements are within the very high risk zone these includes Geregu, Gbokojo, Adogu, upake, Adogo, Achaga, Badogo, upaga etc

Keywords: Risk, Flood Disasters, GIS, S.R.T.M, MODIS

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