

# **Flood Hazard Analysis And Damage Assessment Of 2012 Flood In Anambra State Using GIS And Remote Sensing Approach**

**Udo Ahuchaogu Emmanuel, Nkechi Baywood, Gift Udo A and Oliver OJinnaka (Nigeria)**

**Key words:** Risk management; Flood Disasters; GIS; Vulnerability; MODIS

## **SUMMARY**

The unprecedented catastrophic flood that occurred in 2012 is described as the worst environmental disaster in Anambra state's memorable history. The flood which was prolonged than any known event, resulted in severe damage and untold sufferings to the inhabitants of the state. Capturing the extent of flooding during an extreme event in an efficient manner is essential for response, recovery, and mitigation activities. This study exploits geospatial technique in flood management with the goal of identifying and mapping areas vulnerable to flood hazard and identify the extent of damage resulting from the 2012 flood disaster in Anambra state . It identifies spatial variations in flood hazard levels, spatial and economic impact of the 2012 flood disaster and the population exposed to different levels of risk in Anambra with a view of fostering the best approach for flood management. This study considered five factors as indexes of flood hazard identification and these included elevation, proximity to drainage, Land use, population density, flow accumulation and slope. These information were derived from SRTM, google earth imagery, and population data of the study area. While the extent of inundation was mapped using MODIS remote sensing data captured on 20th October 2010 before the flood and 13th October 2013 during the peak of the event. To extract and map the flood-affected areas, the time series MODIS data and the google earth imagery were entered into the ArcGIS 9.3 Version and projected to UTM coordinate system for on-screen digitization. The true width of the river channel was extracted from the image captured before the flood while the extent of inundation was captured on the image acquired during the flood. This study revealed that a total landed area of 1078Sq.kms was covered by flood excluding the original extent of the river while property worth of twenty three billion naira was damaged. It further revealed that area of land of 2106.78km<sup>2</sup>(43.40%), 955.392km<sup>2</sup>(19.68%), 835.054km<sup>2</sup>(17.20%), 555.48km<sup>2</sup>(11.44%), 402.334km<sup>2</sup>(8.29%) are occupied by very high, high, moderate, low and no hazard categories while A total number of population of 1814733(43.40%), 822953(19.68%), 719298(17.20%), 478486(11.44%), and 346561(8.29%) are residing at very high, high, moderately high, low, and no hazard zones.