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Flood Devastation Assessment Through Mapping in Nigeria-2022 using Geospatial Techniques

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Abstract : One of nature's most destructive occurrences, floods do immense damage to communities and economic losses. Nigeria country, specifically southern Nigeria, is known for being prone to flooding. Even though periodic flooding occurs in Nigeria frequently, the floods of 2022 were the worst since those in 2012. Flood vulnerability analysis and mapping are still lacking in this region due to the very limited historical hydrological measurements and surveys on the effects of floods, which makes it difficult to develop and put into practice efficient flood protection measures. Remote sensing and Geographic Information Systems (GIS) are useful approaches to detecting, determining, and estimating the flood extent and its impacts. In this study, NOAA VIIR has been used to extract the flood extent using the flood water fraction data and afterward fused with GIS data for some zonal statistical analysis. The estimated possible flooding areas are validated using satellite imagery from the Moderate Resolution Imaging Spectroradiometer (MODIS). The goal is to map and studied flood extent, flood hazards, and their effects on the population, schools, and health facilities for each state of Nigeria. The resulting flood hazard maps show areas with high-risk levels clearly and serve as an important reference for planning and implementing future flood mitigation and control strategies. Overall, the study demonstrated the viability of using the chosen GIS and remote sensing approaches to detect possible risk regions to secure local populations and enhance disaster response capabilities during natural disasters.

Keywords : flood hazards, remote sensing, damage assessment,GIS, geospatial analysis
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