

Analysing the Aftermath of the Weija Dam Spillage Using Geographic Information Systems

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SUMMARY

The predicted rise in population densities within the fringes of urban cities has been exacerbated due to the lack of efficient spatial planning tools especially in developing regions. In the Greater Accra Region of Ghana, the Weija dam, an essential resource which supplies 80% of portable water for the region has led to thousands of residents displaced following the spillage of the dam. This is mostly due to the encroachment of residents on prohibited flood plains. This paper therefore employs geospatial tools to investigate the aftermath of the Weija dam spillage. It examines land use/land cover changes and the fluctuations in the volume of water over a 10- year period. This is done through the use of an integrated remote sensing approach focusing on change detection analysis and digital elevation modelling (DEM). Additionally, a flood vulnerability map is created using multi-criteria analysis in an ArcGIS environment to aid in the mitigation of future flood damage. Time-series rainfall data and risk mapping both indicate that the Weija Township, located downstream, is at risk of flooding during periods of extreme precipitation. The use of a questionnaire survey was used to support the empirical evidence derived from the analysis run and to propose some recommendations to help protect the lives and properties of the residents in Weija. This paper has therefore shown that geospatial techniques is a useful tool for addressing urban spatial planning challenges.

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