

# Optimizing Locations for Best Management Practices in Watershed Zones in Developing Societies (A Case Study of Edim Otop Area in Calabar, Nigeria).

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**Key words:** Land management; Positioning; Land Degradation; Erosion; Flooding; Best Management Practices; Watershed; Soil; Water; DEM; Land Use

## SUMMARY

Land degradation from Erosion and Flooding poses cut-throat challenges to maintaining healthy habitats for both man and animal especially in developing societies. Watersheds have remained the immediate relatable environment to local communities within areas of these hazardous phenomena yet the understanding of these watersheds and their components remain relatively unknown to the indigenes whose activities contribute to the depreciation in soil and water properties. This paper aimed to address the use of Hydrological and Terrain Geo-spatial analysis in mapping sub-watershed Zones in Edim Otop Area in Calabar, Nigeria by determining best suited locations for implementing selected Best Management Practices (BMPs). The BMPs considered for this study include flow path identification, open space selection, Riparian Buffer, Rainwater harvesting, Bioswales and Tree planting. The methodology involved creating watershed zones from Digital Elevation Models (DEM) and Land Cover information derived from available open source data. The community centered watersheds were categorized into upper, middle and lower watershed zones by classifying localized elevations using threshold values and then in combination with the other factors which were analyzed to choose optimal locations for the various BMPs by considering proximity to existing hazards and their relative positions in the sub watershed zones. The overall output was in line with achieving enhanced soil and underground water conservation by integrating spontaneous community understanding of the composition of the watersheds and the its effective management. The final products were the BMP maps that were used to communicate and enhance community involvement in effective and inclusive management of the watershed.

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