

**INTEGRATION OF GIS AND REMOTE SENSING IN
ENVIRONMENT IMPACT ASSESSMENT - A CASE OF EWASO
NYIRO MEGA DAM.**

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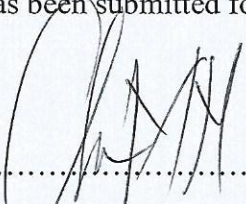
Declaration

This thesis is my original work and has not been presented for a degree in any other university.

Signature:  Date 29/01/2016

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This thesis has been submitted for examination with our approval as the university supervisors.

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Abstract

Geospatial Information System (GIS) is increasingly being used worldwide within Environmental Impact Assessment (EIA); however the extent has not been well documented and therefore not well appreciated in the scientific fraternity. In this case study the National Water Conservation and Pipeline Corporation (NWCPC) on behalf of the Kenyan government engaged a lead consultant to among other things identify a suitable site for a mega dam to supply water to the proposed Isiolo resort city. The consultant decision to locate the Mega-Dam at 'Crocodile jaw' dam site was not based on any scientific study since no evidence has been adduced to indicate the contrary. This could be one of the many other projects being implemented in the wrong premise courtesy of local divisive tribal politics, influence of leaders and administrators. The case study applies spatial analysis to counter the outcome of the consultant in locating the ideal dam site.

The Ewaso Nyiro basin was identified and the relevant data on dam siting collected and processed on ArcGIS 10.3 environment. Spatial analysis was carried out based on weights realized through the Analytical Hierarchical Process (AHP) to determine the suitable sites along the basin.

The analysis realized three suitable dam sites that were subjected to further analysis based on the local conditions to finally settle at the most suitable site for the Mega-Dam which falls on elevation 1570m asl and storage capacity of 235.5 Million Cubic Metres, exceeding the proposed dam requirement by 20.5 Million Cubic Metres. The site slightly differs from the one fronted by the consultant in terms of capacity, inundation area, and dam crest length.

The study has revealed that the most ideal site is within vicinity to the site identified by the contractor. Decisions taken regarding the length of the dam wall are misleading since no scientific approach was adopted. There is danger of implementing very noble, gigantic and capital intensive projects in the wrong premise when wrong decisions are made based on unscientific means.

Key Words: Analytical Hierarchical Process, Dam Siting, Environment Impact Assessment, Reservoir and Spatial Analysis.