

APPLICATION OF REMOTE SENSING & GIS FOR PLANNING FOR RESETTLEMENT OF LANDSLIDE VULNERABLE SETTLEMENTS IN BADULLA DISTRICT OF SRI LANKA

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Abstract of Paper

Introduction

Sri Lanka is an island nation which is geographically consists with three pene-plains where the mid and hill country severely affected by natural disasters like landslides is damaging the safety of people, property and infrastructure facilities. Although landslide is a geo-dynamic process which naturally shapes up the geo-morphology of the earth the major concern of the Government is to control of unstable slopes in the mountains from increased demand for development and agricultural practices which causes with heavy rainfall to develop wetting front and elevation of ground water table where it change the hydro-static and hydro-dynamic forces at the slope.

The National Physical Plan -2011 consider this situation and recommended to further examine the Central Fragile Zone defined and detail out the potential landslide prone areas, make proposals as remedial measures to minimize the vulnerability levels etc. The multi faceted multi stakeholder approach in addressing these issues through Strategic Environmental Impact Assessment within Uva Province detailing the impact with the application of Google images and GIS technology and map out various levels of vulnerability and define the areas for resettlement in future. This research paper elaborates the process undertaken and the results generated and the measures recommended for the Government to implement in future.

Objectives

- To Verify and justify the Settlement Structure with the maps prepared by NBRO in different levels of landslide prone areas by analyzing additional causative factors for landslide
- To assess and define most vulnerable settlement areas for relocation including settlements, urban centers and infrastructure facilities and identify the potential locations free from such disasters for planning new settlement structures.
- To assess the investment requirement for the implementation of the proposed actions against the impact.

Methodology

The methodology applied for verification of settlements which are subject to landslide prone areas include the analysis of geological and topographical characteristics with DEM, land use, cropping practices and land management, rainfall characteristics and soil erosion pattern for the production of inferred map of landslide by assigning weights and rating on their relative contribution to causing landslides on expert opinion and statistical analysis of historical data and thereafter verify it with terrain characteristics.

Analysis

The nature of map (SON) for each causative factor is separately overlay which using GIS for each resulting polygon to generate cumulative hazard rating values for settlement areas. The overlaid map is then classified into landslide hazard zones based on cumulative hazard rating on Settlements in:

- Landslides are not likely to occur
- Modest level of landslide hazard exist
- Landslides are to be expected
- Landslides are most likely to occur.

The guidelines have developed to follow when physical development takes place or land utilization for different uses in different landslide hazard zones where landslides are clear and risk levels are high. Recommend to have forest plantations in most vulnerable areas.

Key Words – Landslide, Vulnerable, Planning & Settlement, Fragile,