

STUDIES ON LANDSLIDES VULNERABILITY AND ITS IMPACT ON PALANI HILLS ECOSYSTEM USING REMOTE SENSING AND GIS

Name: C.Sivakami

Register No: F8682

1. Introduction:

Landslide is a “mass wasting” which denotes any down slope movement of soil and rock under the direct influence of gravity and a disaster that can potentially affect the general quality of life in very many ways.

2. Objectives of the Study

1. To study the spatial characteristics and impact of Rainfall, slope, aspect, elevation, road, soil, drainage, lineament, geomorphology and Land use/land cover for assessing the susceptibility to landslide.
2. To assess and compare the landslide susceptibility using weights of evidence model and frequency ratio model.
3. To prognosticate landslides vulnerability locations by using past inventory locations and present study results.
4. To suggest landslide mitigation strategies in the study area.

3. Study Area

The extension of the study area lies between 10°13'N Latitude, 77°32'E Longitude is situated in Palani hills and it occupies 1050 sq.km.

4. Methodology Adopted

The innovative methodology of involving integration of remote sensing based inputs from space and field data is adopted for this study. Based on the existing locations of landslides and taluk level study of landslide prone zones, the Kodaikanal taluk has been selected for this present study. Ten thematic layers like geomorphology, elevation, land use/land cover, slope, aspect, drainage, road, stream, lineament and soil were generated in GIS environment using high resolution satellite (IRS-P6) data, Cartosat – 1, SOI toposheets, Google maps and integrated in GIS environment.

5. Results and Discussions

This study adopts two different models Frequency Model and Weights of Evidence Model for deriving the landslide vulnerability map using ten landslide causing factors and landslide vulnerability. Low vulnerability' (3.32 %) Zones which are totally free from Landslides are scattered and clustered in agricultural and built-up area. In the zones of 'moderate vulnerability' (10.16 %) are sparsely distributed on the agricultural area, the combination of physical parameters may adversely influence slope stability. The 'high vulnerability (36.31 %) category exhibits a strongly clustered pattern of spatial distribution found mainly in Pannaikadu, Vilpatti, Vadakavunji. The 'very high vulnerability' (50.21 %) scattered in the study area bears a high potential for landslide occurrence, mainly found in Kodaikanal and is characterized by relatively high elevations and steep terrain. The Landslide Vulnerability Zone has been field verification based on the existing locations of the identified landslides, which actually fall within the high and very high zones, and existing ground conditions are very likely to create serious landslide problems.

6. Conclusions

The study has employed the application of Remote Sensing and GIS for the derivation of Landslide vulnerability Zonation using by frequency model which is the best and most suitable. The following suggestions are offered for the mitigation of Landslides;

- The soil conservation in the area agricultural activities.
- Afforestation, forest conservation and canalization though to be set up in the area of dense and medium vegetation. Slope modification and afforestation to be made mandatory in the area of degraded vegetation / forest blank.