

Title: Landslide Risk Assessment of South-western Ghats of Maharashtra

Map description and analysis

Introduction:
A landslide is recognized as significant environmental disaster, especially in low or high severity in almost every country (Gao and Maro, 2010). Recently, landslide hazard mapping is quite possible due to easy access and a fine resolution of remote sensing data and thematic layers using Geographical Information Systems (GIS) (R Gupta et al. 1990; Scaioni et al. 2013). The prime objective of this entire investigation is to delineate the landslide hazard zone and prepare the landslide risk assessment map using geospatial models for the south-western Ghats of Maharashtra.

Methodology:

- Gupta and Joshi (1990) proposed a model in zoning landslide hazard using GIS called Landslide Numerical Risk Factor (LNRNF), which is a useful model, particularly for mountainous regions.
- Landslide Numerical Risk Factor (LNRNF) model is performed in QGIS (Open Source) by integrating different Geo-environmental factors (Geology, Geomorphology, Slope, Elevation, Lineament, Rainfall and LU/LC) and landslide inventory (prepared through LISS data) for Landslide hazard zonation. In this analysis, the weight of each class is determined by dividing the number of landslides in one unit by the average number of landslides in all units.
- All thematic layers are prepared in QGIS using Indian Geospatial portals of nodal agencies. The accuracy assessment of LNRNF model is carried out using Quality Sum (Qs) index in Microsoft excel, the outcome shows 3.98, which is a better result.
- Finally, the risk assessment map is carried out in QGIS on the road as an element at risk. The attached landslide risk map illustrates the potential damage of roads affected by landslides. The total length of the roads in the area is 331 km. There are many roads within high and very high landslide hazard zones (14%). All databases regarding landslide risk assessment are kept on the MYMAP visualization website.

Applications and use of Map:
The frequency and intensity of a landslide is being rapidly increasing in the Western Ghats region.

- The landslide risk map would be useful in choosing locations for the installation of the real-time landslide monitoring system.
- Also, the retaining structures, gabion walls, wired mesh and rock anchors meshes can be installed by using the reference of landslide risk map of the Western Ghat region of Maharashtra.
- The landslide risk map will be useful for planners, engineers and decision-makers in choosing locations for the prevention and mitigation of existing and future landslides.

References:

1) Gao, J. and Maro, J. (2010). Topographic controls on evolution of shallow landslides in pastoral Wairarapa, New Zealand, 1979–200. Geomorphology, Vol.114, pp.373–381.
2) Scaioni, M. (2013). Remote sensing for landslide investigations: From research into practice.Remote. Sens. 5, 5488–5492.
3) Gupta, R. & Joshi, B. (1990). Landslide hazard zoning using the gis approach—a case study from the ramganga catchment, himalayas. Eng. Geol. 28, 119–131.

Note- the QR Code is made for visualization of Landslide Risk Assessment in MyMap



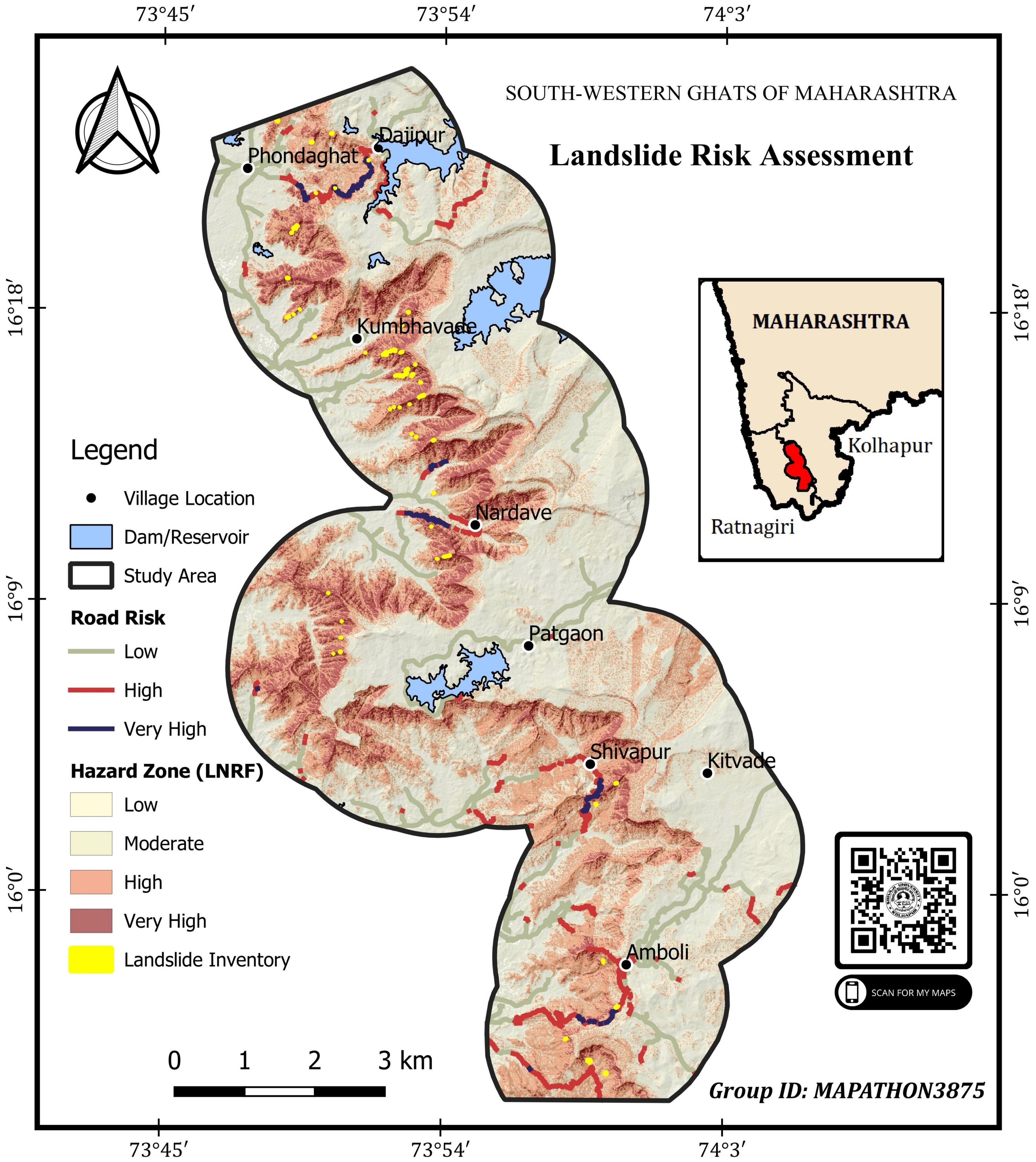
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Topic: Landslide Risk Assessment

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Data courtesy: BHUVAN, NRSC, Hyderabad