Environmental aspects of landslides in Nilgiris district, India: Issues and Needs

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ABSTRACT

Globally as well as in India, Landslides is the most significant problem. Assessment to recognize and report the landslide accomplishments such as scars, remedial measures and susceptible zones has been conducted. The Indian hill masses are susceptible to landslides from low threat to severe landslide risk. The study area we considered for the landslide hazard mitigation is the Nilgiris district, Tamilnadu, India. The Nilgiris district located in the southern part of India on the Western Ghats is prone to High to harmful Landslide Hazard. In latest past, the existence of landslides in Nilgiris isaugmented. The chronological landslide recordexploration of this partobviouslyexposes that the future landslide incidence in the district is multifold and dreadful. Many researchers enumerated the landslide hazard and risk in these areas, though there is no much studies landslide hazard mitigation development, environmental and communal associated issues. Informed marks of landslides are evidently articulates the needs of the areas dangerous importance and remedial processes have done by the authorities are noticeably expressed the influence interest and incessant care. In science anthropogenic and natural phenomena's are well-structuredreason for the landslide. In this association the prevailing landslide hazard consequence, the instigation made on landslide hazard mitigation in the district, the probability of cost effective technology for slope steadiness, conservational and public issues need to be addressed for the Nilgiris district were considered and recommendation were given to overcome these concerns. The reviews outputs are used to categorize and to distinguish the mitigation level of actions and understand further. People should conscious about the specific phenomenon but they finally deficient in the awareness knowledge's for such land other resource of the life requirements. The current study can be used for explaining useful information to the environmental scientists, planners and policy makers in landslide hazard mitigation practices in the Nilgiris district. The study prototypes should be categorized and wretched to the society as a first remedial and mitigation action in the study area.

Keywords: *Landslides, Hazard, Scars, Vulnerability, mitigation, Nilgiris.*

INTRODUCTION

Landslide hazard is one of the most important hazards that have emotional impacton different parts of India every year during the rainy season. There is a discrepancy in the degree of landslide occurrences in various hill ranges. The Government of India characterized the Nilgiris district of Tamil Nadu state is one of the severe to very high landslide risk prone areas of India. The district is well known for the landslides hazard. In the recent times connections and harm due to landslides have increased in the Nilgiri Hills. Nilgiri region is extremely renowned for the active landslides. All kinds of landslides has been happened and accounted largely. The influence of landslide is accounted in and around 21 States and Union Territory of Pondicherry, hilly regions of Himalayas, North Eastern parts of India, Nilgiris, Eastern Ghats, and Western Ghats, in every year and makes loss of life, organization and belongings. The effect of landslides intimated the warning for the essential and urgency of Habitat safety in Landslide Hazard Prone Areas.

The current study examines the reasons of landslides, existing landslide hazard consequence, disputes by landslides handled on environment and society in the Nilgiris District. The area hastened with rainfall in both the southwest and northeast monsoon. Southwest monsoon 50% in west and 40% in west are accounted as rainfall. It was sensible in northeast monsoon which donates near 45% of rainfall. Substantial level of rainfall

accounted in both winter and summer periods. The temperature is respectable in all the year of the climate. The moisture is more in afternoon than mornings when in range exceeding of 85%. It also provides the information that indicates the reduction of losses from landslides and increase public protection through developed understanding of landslide hazards necessitates emerging the information, scientific understanding and competences required to issue accurate warnings, advisories, or notifications of landslide hazards.

2. STUDY AREA

Fig.1: Location map of the study area

The study area is a part of the Western Ghats and lies between the latitudes11°12 N to 11°37 N and longitudes 76°30 E to 76°55 E. It lies in the Survey of India toposheet No.58 A/6, 7, 8, 10, 11, 12, 15 and 58 E/02. The maximum and minimum altitudes are 2640m and 300m above mean sea level. The natural boundary of the plateau along much of its Southern side is the BhavaniRiver and the Northern frontier is bounded by Moyar River. Charncokite and pyroxene granulite and covers a major part of the district. The lithology is the Charncokite group of rocks with the enclaves of SatyamangalamSchist Complex exposes in the Nilgiri district. It is bounded on the north by Karnataka State, North West by Kerala State, on the South East by Coimbatore District and the North East by Erode District of Tamilnadu. Most of the parts in the district rocks are deeply weathered and the soil thickness is found to be up to 40m with lithomarge is a common feature in the district. Geomorphologic ally the Nilgiri hills rise abruptly from the surrounding plains to an elevation of 1370m alms. The drainage is dendritic to radial at places with prominent rapids, cascades and water falls. The Ootacamund and Coonoor surfaces include gentle mounds, with soil cover, stream meanderings and gentle smoothening of the hills. The latter abuts against the former at many places, with break in slope.

3. HAZARDS OF LANDSLIDE

The chiefbases of landslides in dissimilar places were recognized and the part played by extreme deforestation, impediment to the normal drainage channels and alterations in land use were found by the team. The geologists have also been capable to create for the first time in the country a zonation map of landslide vulnerability on a regional scale. Also the report stretches endorsement for limitations on changes in land use, roads, urban development, housing associations and reservoirs. The risk quantification analysis for part of The Nilgiris district were conceded by Geological Survey of India, in association with ITC Netherlands During the last three decades, the population in the Hills has gone up many folds as a development to heavy urbanisation and tourist influx, exercising severe stress on geo-environmental parameters. Under the conditions, renaissance of the slide could be dreadful. Hence,

comprehensive study will help to recognize the potential parameters of slide for observing, alleviating and premonition.Validation of the landslide vulnerability zones of the test sites in fig.2 shows that the method is suitable for the study area, so the same method extend to the entire study area by assigning the same weightages to the classes of the individual themes and converted in to weighted raster layer.

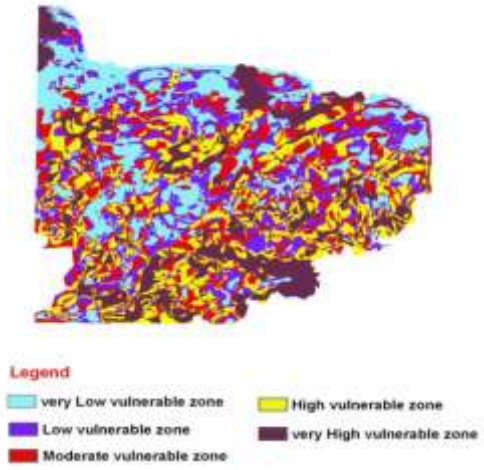

Fig.2 Landslide hazard Zonation map of the Nilgiris district

4. ENVIRONMENTAL ISSUES OF LANDSLIDES

The most evident problems in the areas like the Nilgiris are the effects caused by the landslides. There the soil and rock present in that area is very weak and prone to any attacks by the nature. Landslides have extensive ranging influence on the people of the exaggerated area in terms of the devastation caused to material and human possessions. The extent of destruction depends on the location of the landslide area. One of the most challengingcomplicationsregarding landslide hazards in place like Nilgiris is allocating with existing urban areas where buildings are raised on or close to a landslide. The most accuratemethod is to avoid further development and use of buildings is consistent with the level of risk modelled and the district plan maps evidently show landslide threat zones. Some of the chiefconcerns related to environmentand society are discussed here.

The lack of awareness is oneof the main problems among the public as well as the planners.The Department of Science and Technology, Government ofIndia has recommended taking raise awareness among policy creators&developers at state/district and user institution levelthrough leading training programmes/workshops. Also responsiveness should be produced among community leaders andgeneral public affected by landslide hazards about thecost-effectiveness and assistances of taking landslide hazardmitigation measures.As recommendedby National Disaster Management Authority (NDMA), Government of India in the National Disaster Management Recommendations for landslides, from thefunds available with the District Planning and Development Council in landslide prone areas, a share will be allotted for the implementation of landslide management schemes in the Nilgiri district.

5. DISCUSSIONS& RECOMMENDATIONS

A reviewaccompanied by Government of Tamil Nadu exposesthat the existence of landslide gets augmented from 1978 onwards and if the present tendencyremains, the probability of occurrence of landslide will rise from 70% to 100% in the Next 10 – 20 year's period. Firming of buildings and arrangement should lead to decrease in Susceptibility. The weakness of buildings as well as infrastructure in a landslide however is most in cases nearly 100 percent, irrespective of the quality of construction. Hence the susceptibility of the constructionscannot be condensed. The illiteracy is one of the chiefreasons to move inhabitants to highly vulnerable areas.There was inappropriate drainage system in the residential areas is the other cause of landslides. Subsequently most of the drainage were clogged and people constructed houses over the river drainages and distracted the water course rudely.

For the improvement of road the natural slopes were cut by the activities without any engineering studies is the major cause of landslide in road side areas. The purposes of soil bio engineering works also have parallel role as civil engineering structures. The price of executing this practice also is very much less than the civil engineering processes. Also the natural beauty of the hills would be reserved in the hill slopes. The Soil bio engineering affordsdeveloped landscape and habitat values. Though the soil bio engineering is not appropriate for all sites and situations, it is

recommended a comprehensive site precise study should be carried out before instigating this technique.

CONCLUSION

The reason for the hazard might be identified firstly then the solutions have to be found out appropriately. A landslide threatvaluation, which is usually in the form of a map, affords people with a practical and cost effective way to identify areas where landslides exist or could occur. The district is characterized under austere to Very High landslide hazard prone areas. This designates the area is well known for the vulnerability of landslides, and for the recurrent threat to life and property. Constraint on all new buildings and acceptance of improved land use and management performsrate to be stimulated. Reserves on landslide remediation processes, on public education and on early warning systems are toughlydesignated.One of the most problematicdifficultiesregarding landslide hazards in place like Nilgiris is distributing with prevailing urban areas where buildings are raised on or close to a landslide. The ultimate approach in this situation is to evade further expansion in high risk landslide prone areas, boundary surviving use rights to reconstruct, and bound the use of buildings. The most accurate method is to avoid further development and use of buildings is reliable with the level of risk modelled and the district plan maps evidently show landslide hazard zones.

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