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Review Paper: Analysis of Landslide Hazard Zones (Hotspots) & Mitigation in Western Ghat (Chandoli Region, Maharashtra) Using GIS & Remote Sensing

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Abstract - *Landslides are one of the most dangerous natural disasters in hilly areas. The area surrounding the previous landslide in Chandoli District is spread over four districts – Satara, Sangli, Kolhapur and Ratnagiri, Maharashtra districts were chosen as the study area. Landsat8 provides the basis for obtaining basic information about various metrics such as Google Earth, Google Maps and other satellite imagery, as well as Survey of India (SOI) geographic pages, NDVI slope, associated relief, water congestion and geology/lithology. The purpose of this study was to understand the importance of mapping geological bonds and landscape features including streams, slopes and features. Streamline flow is one of the main causes of landslides. Any corrective action should include one or both of the following characteristics. Therefore, the most common landslides are detected using GIS and remote sensing. Analysis images were collected in February 2022 and analysis was completed in May and June.*

Key Words: **Landslide, GIS, Remote Sensing, Mapping, Survey of India etc.**

1. INTRODUCTION

Also known as a landslide or mudslide, a landslide is a type of damage that includes various ground motions such as rock falls, deep slope falls, and shallow debris flow. Land degradation is a major problem in almost every part of the world as it causes economic or social damage to private and public property. Natural disasters have demonstrated the devastating power of mass displacement during a devastating earthquake that can cost lives and cause extensive damage to property and infrastructure each year. Remote Sensing (RS) and Geographic Information Systems (GIS) play a key role in effective disaster risk reduction and management and provide a framework for monitoring, evaluation, fault detection and the development of appropriate disaster risk management measures. RS and GIS have become important tools for predicting and measuring natural hazards in geology. GIS can be used to create risk analysis models that can be used to save lives and property, from better knowledge of potential disasters to better knowledge of potential disasters. Although natural disasters have increased dramatically and frequently over the past few decades, there has been a tremendous increase in the power of technology to mitigate them. As a result, the economic damage caused by natural disasters increases over time. These cuts in human settlements, the new urban environment and the shortening of engineering are consuming some of the natural budget. A risk assessment is required to identify any risk assessment areas that can be used to plan land use. Chandoli region in Maharashtra is divided by arid climate, low population density, natural vegetation, low soil conditions, diverse geomorphology and slope gradient. Any sustainable development strategy in the Chandoli region (western Ghat) faces significant environmental challenges such as landslides, water scarcity, flooding and groundwater pollution. In addition, risky behaviors brought about by rapid development rates can permanently endanger natural resources and culture. Chandoli and its surroundings were chosen as a study to assess the environmental risks of the area and to plan the entire Western Ghats area. The dangers of landslides pose a serious threat to health, property and infrastructure and can be a major barrier to local growth.

2. STUDY AREA

One of Chandoli's most important water resources is under testing. The tested region is located between latitudes 170°04'00"N and length 170°19'54"D and length 730°40'73"N, and 730°53'09"D length covers an area of one square. mileage 1385.82. Sub-company data will be managed digitally and collateral data will be created on topographic maps. Limited landscape and metaphor estimates for 1977 and 2005 revealed that 120.9 km2 of conifer forests that had existed for 28 years have now disappeared. On the other hand, 51.15 km2 in trees and 64.19 km2 in grassy areas. In addition, forest cover and land use maps of the research area will be included in the data below by using the 'high probability classification method'. This study will help demonstrate that the Park supports a variety of shrub habitats, grasslands, reclaimed land, and conifers. The study will be used to represent the Western Ghats Tropical and Radiation Analysis (Chandoli Forest, Maharashtra) and its environmental impact on the affected area using GIS and Remote Sensing. Since the Sahyadri range is in the middle of the study area and receives heavy rainfall, soil erosion is likely in the region.

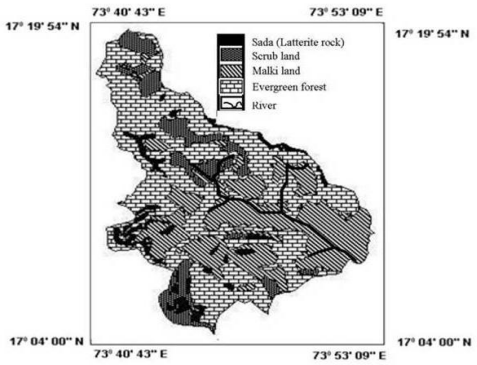

Fig -1: Study Area of Chandoli Region

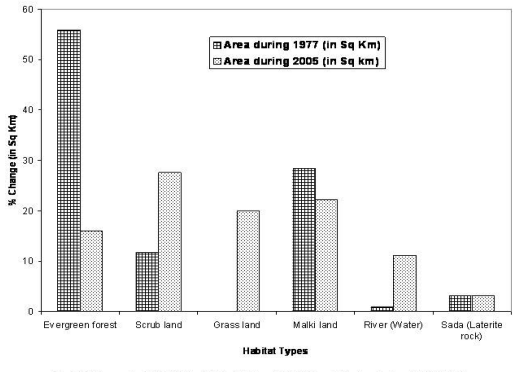

Fig -2: Change in wildlife habitat Study Area of Chandoli Region

3. Literature

[1] A painting by SS Thigale, AS Khandge to prepare a picture of the dangerous landslide area of the Ghats in western Maharashtra, India. Geo informatics 1996 jstat.jst.go.jpFactor

A four-stage website design approach required for the Western Ghats LHZ maps is proposed. Accordingly, the study area is divided into four zones with landslide potential: Most Dangerous, Dangerous, Medium Dangerous and Low Risk. The numerical details found in the representation area are presented and discussed for the efficiency of the operating system. It has been suggested that the measurement system could be useful in linking areas affected by the Western Ghats collapse, and data storage could be used in GIS/ILWIS.

[2] Pre-landslide risks of the Patan Lateritic Plateau, Western Ghats, Maharashtra, India. RAD Urai swami, B B Mascare. scientific world.edu

The Patan Plains, west of the Ghats in Maharashtra, India, is a step-by-step expedition that has suffered many casualties in the past. The area receives heavy rainfall and is located within the epicenter; these two main factors are the cause of landslides in these areas. Field, GIS and RS studies were used to map the Landslide Hazard Zoning (LHZ) area map. The Analytical Hierarchical Process (AHP) was used to refine the LHZ map, which includes land use - land cover, water density, geology, slope and aspect layers.

[3] Use of Geospatial Technology in Environmental Assessment, E Imam, O Lays, MM Hussain-EnvironmentalImpactAssesment-taylorfrancis.com

In this study, the suitability of the gaur (Bosgaurus) index was planted in the Indian Chandoli Tiger reserve. This was obtained in GIS and RS methods.

[4] Forever Earthquake Prediction and your ongoing monitoring using GIS and recommendation of Kumbharli Ghats, Maharashtra's WSN System-A. AA Bhondave, Snehal Rajendra Suryawanshi, Purshottam Deshpande, Umesh Deshpande.

RS and GIS are widely used to predict global landslides. Landslides, rock falls, landslides, falls, creeps, etc. in the Kumbharli Ghats area. It includes various types such as Aster DEM and Landsat 7 data are used to create different layers and identify pre-existing landslides and sloping slopes. Wireless sensor network (WSN) is an important system that integrates geophysical sensors with a global mobile communications system that will provide real-time slide slope and predict future landslides.

4. Hypothesis

[1] Landsat8, Google Earth, Google Maps and other satellite imagery as well as Survey of India (SOI) landscape sheets will serve as the basis for deriving key metrics for various metrics such as NDVI slope, related relief, traffic congestion. This. And geology/lithology.

[2] The aim of this study will be to understand the importance of mapping geological bonds and landscape features including streams, slopes and features.

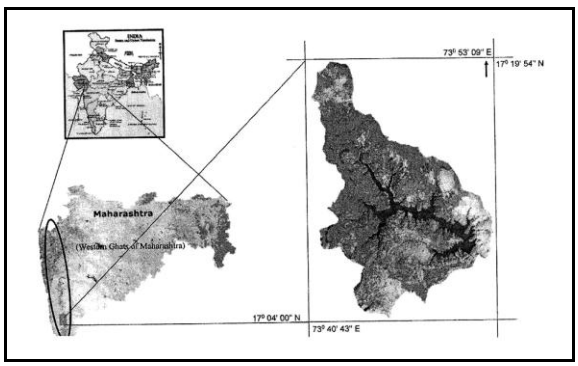

Fig -3: Location Map of study area (Chandoli Area)

5. Objectives

Earthquake Assessment in the proposed study area (Chandoli District).

Investigation of Effective Mitigation Plans and Causes of Earthquake and Environment of Chandoli District, (Western Ghats, Maharashtra).

Identify possible causes of Landslide using Landsat8, Google Earth, Google Maps and other satellite imagery, as well as the Topographic Survey of India (SOI) pages.

The report will express the overall concept of the research program and effective mitigation of the current situation using information on various metrics such as NDVI slope, relevant relief, water congestion and geography.

The natural impact of soil erosion in the study area (groundwater levels, vegetation, streams, etc.)

6. Scope

The scope of the research project will be to study and obtain LANDSLIDE HAZARD ZONES in Chandoli area, Maharashtra and provide similar discounts. The research work also includes the determination of a critical LHZ in the Chandoli area and surrounding Maharashtra area, including river flow, soil conditions, vegetation, etc., on the affected study area. It will also look at the natural effects of soil erosion, such as This will also highlight the importance of research into various aspects of global warming risks, including studies in geology and geomorphology, RS and GIS, and environmental impact and disaster risk management.

7. Methodology

This work will be implemented in the following steps:

1. Production of local site for analysis.
2. Development of analysis maps.
3. Learning Area Slope (DEM) map.
4. Distribution map of the study area.
5. Preparation of the NDVI map of the study area.
6. Landslide Hazard Zoning (LHZ) Maps.
7. Results and Discussions.

REFERENCES

[1] [1] Shahabi, H., & Hashim, M. (2015). A collapse risk system using mathematical models available on the GIS and a remote catch book in the tropics. Scientific reports, 5 (1), 1-15.

[2] [2] Arnous, M. O. (2011). Integrated insights and GIS approaches to landslip risk assessment: a record of what happened Wide Water extent, South Sinai, Egypt. Coastal Conservation Journal, 15 (4), 477-497.

[3] Ramakrishnan, D., Ghose, M. K., Chandran, R. V., & Jeyaram, A. (2005). Probabilistic approaches, GIS and awareness separation in landslide risk mitigation: a record of what happened in Sikkim Himalayas, India. Geo carto International, 20 (4), 53-58.

[4] Chen, T., Niu, R., Du, B., & Wang, Y. (2015). Earthquakes associated with the GIS system exposure system and fragmented emotional states: a record of what happened in Zigui Province, Three Georges Warehouse, China. Environmental Science, 73 (9), 5571-5583.

[5] Pradhan, B., Mansor, S., Pirasteh, S., & Buchroithner, M. F. (2011). Risk hazards and risk perceptions in a designated drainage area using a mathematical geospatial model. International Journal of Remote Sensors, 32 (14), 4075-4087.

[6] Reis, S., Yalcin, A., Atasoy, M., Nisanci, R. E. C. E. P., Bayrak, T., Erduran, M. U. R. A. T., & Ekercin, S. (2012). Remote anticipation and the GSL exposure system based on GIS uses the repetition percentage and method of assessing the order of Rize responsibility (NE Turkey). Environmental Earth Sciences, 66 (7), 2063-2073.

[7] Gaikwad, S., Chandak, P. G., Kumthekar, M. B., & Deshpande, P. K. Image Information Support on Uttarakhand Earthquake Risk Management Maps.

[8] Rai, P. K., Mohan, K., & Kumra, V. K. (2014). Risk of landslides and an attractive system using random anticipation and GIS. Scientific research journal, 58, 1-13.

[9] Sarkar, S., & Kanungo, D. P. (2004). The integrated approach to the landslip vulnerability system is using separate thinking and GIS. Graphical Engineering and Remote Sensing, 70 (5), 617-625.

[10] Ayalew, L., & Yamagishi, H. (2005). Application for modification of GIS content for landslide risk program in the mountains of Kakuda-Yahiko, Central Japan. Geomorphology, 65 (1-2), 15-31

[11] Saint G. 1980. A divided feeling of many things: satellites provide a new way to manage Earth's finances. ActaAstronautica, 7: 373-383

[12] Singh A. 1989. Methods for obtaining digital change using the expected dose by chance. International Journal of Remote Sensing, 10: 989-1003

[13] Singh IJ, Mizaurahaman M, Kushwaha SPS. 2006. A review of the impact of expansions on stock expansion in the Tahno Dehradun Forest Division range using integrated monitoring and GIS. Journal of the Indian Society of Remote Sensing, 34: 209-217

[14] Smith DP, Atkinson SF. 2001. The accuracy of the development using a world-class map against sub-GPS control points. Photogrammetric photography and split vision, 67: 565-570

[15] Stone TA, Lefebvre P. 1998. It uses a multi temporal subsidiary dossier to judge a discriminatory record in Para Brazil. International Journal of Remote Sensitive, 19: 2517–2526

[16] Sugumaran R, Pavuluri MK, Zerr D. 2003. The use of metaphorical metaphors to label various forest species using a established and legal-class distinction method. Geoscience and distant hearing, 41: 1933-1939

[17] Tahir M, Hussain T. 2008. Natural geography. Jawahar Publishers and Distributors, New Delhi, India

[18] Thakur AK, Sing S, Roy PS. 2008. Ortho dose adjustment of IRS-P6 LISS-IV dose using Landsat ETM and SRTM database in Himalayas of Chamoli District Uttarakhand. Current Science, 95: 1459

[19] Victorov S, Kildjushevsky E, Sukhacheva L, et al. 2007. The discovery of the transformation of the coastal region through the use of divisive metaphors and residential text. In: Use of Environmental Science for Environmental Assessment (IP etrosillo etc., eds). Springer, Netherlands, 155-164

[20] Vitousek PM, Mooney HA, Lubchenco J, et al. 1997. Human subjection to the world. Science, 277: 494-499

[21] William JS. 2006. Biochemical Methods: A Handbook. Cambridge University Press, USA Wu J, Hobbs R. 2002. Key issues and research planning in rural conservation: an unusual combination. Landscape Ecology, 17: 355-36

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