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WATER FILTERATION USING THE COCONUT SHELL AND NEEM LEAF

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Abstract:
The need for clean water in people's daily lives has made water quality a major problem today. Water can be improved in a lot of ways. In order to protect public health, water filtration technologies have advanced during the past few centuries in rural areas, home to more than a billion people. Nobody on the earth has access to safe drinking water that is free of pathogens. India is one of the populated countries where the impoverished cannot afford to carry around a portable, high-quality source of pure water. A collection of locally sourced filters is used to treat surface water. In the investigation of media to eradicate turbidity, color, and germs, the efficacy of single media and dual media was assessed.
In addition to minimizing this issue, a long-term solution is required. However, using basic techniques to clean drinking water is becoming increasingly difficult in rural places. Furthermore, the government is overburdened with this problem. In rural areas, the government works on a water cleaning program. However, this kind of strategy incorporates contemporary methods of purifying water, such as online pressure filters or water treatment plants (WTPs). The government provides the initial funding for these advanced techniques, but upkeep is often needed once they are put into place. The government does not have the necessary funding for this upkeep. Due to this, gram panchayats and other local government entities are responsible for paying for all maintenance costs. However, such organizations are unable to generate enough money to continue running the program, so it is abandoned and people continue to drink tainted water. Since it poses a serious risk to their health, it is crucial to create practical and affordable methods for purifying drinking water now.
We are developing a cost-effective water filtration filter using neem and coconut shell as a result of this.

Keywords: Filter bed,wate water,coconut shell.

I. INTRODUCTION

Along with the effluent from all distilleries, the dairy industry, the manufacture of vegetable oil, and other businesses, domestic waste water is also dumped directly into the Krishna River. Rivers receive industrial waste products in liquid form. The use of chemicals in our farming practices, which drain rainfall into rivers, together with fertilizers and pesticides, is a contributing factor to river contamination. Pollution is increased when household waste is thrown into rivers. Towns and cities grow in population along with it. Studies show that agricultural waste and industrial wastewater have contaminated practically all of India's rivers. Nowadays, the majority of these rivers function as sewage drainage networks.
In addition to minimizing this issue, a long-term solution is required. However, using basic techniques to clean drinking water is becoming increasingly difficult in rural places. Furthermore, the

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Landslide Zonation Mapping and Vulnerability Assessment of Satara and Raigad District

Mapeamento de zonas de deslizamentos e avaliação de vulnerabilidade do distrito de Satara e Raigad

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Resumo

Os sistemas de informação geográfica (SIG) são as ferramentas influentes que facilitam a recuperação, recolha, análise, armazenamento e exibição de provas espaciais. O sensoriamento remoto (RS) é geralmente definido como o procedimento de aquisição de provas na superfície da terra privada de interação corporal para analisar a vulnerabilidade do lado terrestre. O processo de hierarquia analítica (AHP) é executado para a análise. O SIG e o RS modernizaram as medidas reguladoras dos perigos regulares. Nesta pesquisa contemporânea, é resumido o Mapeamento das Zonas de Deslizamentos e a Avaliação da Vulnerabilidade do Distrito de Satara e Raigad. A investigação investigou a latitude, a longitude, o solo, a textura e as categorias de deslizamentos na região de estudo de Patan e Mahad. Além disso, a visita ao local foi concluída, foram recolhidas amostras de solo, o MDE foi reclassificado, a formação do modelo digital de elevação (DEM) foi executada, as zonas de suscetibilidade vulneráveis foram apontadas e, por fim, o modelo foi preparado. A análise da precipitação é executada porque a maioria dos deslizamentos de terras é provocada pelas chuvas. São realizados o declive, o aspeto, a direção do fluxo da área de estudo e, por fim, o mapeamento do uso e cobertura do solo (LULC). Com base na pesquisa conclui-se que a vulnerabilidade das localidades é média ou elevada. Região com declives intermédios, diminuição das chuvas, cobertura florestal no lado oposto é apontada como a região menos vulnerável de Patan. Em Mahad, 0,59% da região está em risco mais elevado, enquanto 49,336% está em risco intermédio, 41,462% está em risco mínimo e 9% está na categoria de nenhum risco.

Abstract

Geographic Information (GIS) systems are the influential tools which facilitate the retrieval, collection, analysis, storage and the exhibition of spatial evidence. Remote sensing (RS) is generally defined as the procedure for acquiring evidence on the surface of the earth deprived of corporeal interaction to analyse the vulnerability of the landside. Analytical Hierarchy (AHP) Process is executed for the analysis. GIS and RS has modernized the regulating measures of the regular hazards. In this contemporary research, Landslide Zonation Mapping and Vulnerability Assessment of the Satara and Raigad District is briefed. The research has investigated Latitude, longitude, soil, texture and the categories of landslides on the study region of Patan and Mahad. Also, the site visit was completed, sample of the soil was collected, DEM were reclassified, digital elevation (DEM) model formation executed, vulnerable susceptibility zones are pin pointed and finally the model is prepared. Rainfall analysis is executed since most of the landslides are caused because of the rainfall. Slope, aspect, flow direction of the study area, and finally the land use and land cover (LULC) mapping are conducted. Based on the research it is concluded that vulnerability of the locations is medium or high. Region with intermediate slopes, decreased rainfall, forest cover on the opposite side it is named as the least vulnerable regions of Patan. In Mahad, 059 % of the region is in higher risk, whereas the 49.336% is in the intermediate risk, then 41.462% is in minimum risk and 9% comes under the category of no risk.

Key words: Vulnerability, Mapping, Risk, landslide, susceptibility zones.

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Integrative approaches to Landslide Mitigation

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ABSTRACT

Landslides are a major natural hazard, causing significant socioeconomic and environmental damage globally. This paper explores innovative approaches to landslide mitigation, focusing on the integration of advanced early warning systems (EWS) and adaptive engineering solutions. EWS leverage cutting-edge technologies such as artificial intelligence (AI), geographic information systems (GIS), and remote sensing for real-time prediction and monitoring of landslides, enabling timely interventions. Adaptive engineering techniques, including slope stabilization, bioengineering, and the use of smart materials, enhance the resilience of at-risk areas. The study highlights the need for a multidisciplinary approach to effectively combine these strategies, emphasizing scalability, sustainability, and community engagement. Findings suggest that integrated approaches can substantially reduce landslide impacts, offering a blueprint for risk reduction in vulnerable regions. The implications of this research underline the importance of policy support and collaboration among stakeholders to implement these solutions at scale.

Keywords: *Landslide Mitigation, Early Warning Systems, Adaptive Engineering, Slope Stabilization, Artificial Intelligence, Geographic Information Systems, Risk Reduction, Sustainability.*

1. INTRODUCTION

Landslides are a significant global hazard, causing widespread destruction to human life, infrastructure, and the environment. With the increasing frequency and intensity of extreme weather events driven by climate change, the occurrence of landslides has grown exponentially, particularly in mountainous and hilly regions (Petley, 2012). These events not only disrupt local ecosystems but also impose substantial economic losses on affected communities. The lack of preparedness and inadequate mitigation strategies further exacerbate the devastation caused by landslides, underscoring the urgent need for comprehensive solutions.

Mitigating the impacts of landslides is crucial, not only to safeguard lives and property but also to preserve ecological balance and ensure sustainable development. Socioeconomic implications include the displacement of populations, loss of livelihoods, and significant rehabilitation costs (Haigh et al., 2020). Environmentally, landslides lead to deforestation, soil erosion, and the degradation of natural habitats, further aggravating the vulnerability of ecosystems to future disasters. As global efforts focus on building resilient infrastructure and reducing disaster risks, landslide mitigation has emerged as a key area of concern.

The primary objective of this research is to explore advancements in early warning systems (EWS) for landslides, which employ cutting-edge technologies such as artificial intelligence (AI), remote sensing, and geospatial analysis to predict and monitor potential hazards. In addition, the study seeks to analyze adaptive engineering practices that strengthen slope stability and reduce landslide susceptibility. By combining these two domains, this