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DISASTER MANAGEMENT IN INDIA : ANALYSIS OF LANDSLIDE RISK MANAGEMENT FROM NATIONAL AND INTERNATIONAL PERSPECTIVES

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ABSTRACT

This study is grounded in a descriptive approach, analysis upon both Indian and International perspectives. Landslides typically occur in mountainous regions and geologically unstable areas their vulnerability is aggravated by environmental disturbance and human activities. Through an analysis of disaster management frameworks, historical contexts, conceptual definitions, legal aspects, and case studies. This research offers a comprehensive and interdisciplinary perspective on landslide disaster. The study describe traditional Indian environment concerns upon Vedic perspectives as well as Manu and Kautilya alongside historical International tools and strategies for landslide prevention developed by nations such as China and Japan. To assistance a through understanding of landslides, the related process of Weathering Mass Wasting, Erosion are concisely explained. The section on Indian legal aspects incorporates Constitutional provisions, the Disaster Management Act 2005, environmental sachems, delegated powers and the latest updated provisions of Disaster Management Amendment Act 2025. Regarding International legal aspects, global mechanism such as UN International Conferences, United Charter, Kyoto Protocol, UNESCO initiative, Sustainable development frameworks are utilized to explain and compare approaches to landslide risk management. Furthermore, the study involves a comparative analysis of case studies from both Indian and the International arena, aiming to identify common underlying factors contributing to landslide vulnerability. This research designate that while the natural hazards associated with landslide disasters cannot be wiped out. It is crucial at both National and International levels to merge traditional wisdom with scientific methodologies and essential disaster management frameworks to achieve sustainable development.

KEY WORDS

1. Sustainable Development, 2. Environment, 3. Global Disasters, 4. Vulnerability, 5. Landslide Risk.

INTRODUCTION

Disaster is an event that cause harm to environment resources, humans and living beings. It is mainly of two types: Man-Made , which happens due to human negligence, accidents and several reasons. Natural Disaster, which is noticeable due to the degradation of nature. It effects is on the economic and social consequences of the people. It results loss of life, necessary resources and social variables to a large extent. India is a disaster vulnerable country in which many disasters are observed every year. There is a National Policy Framework at the national level for disaster management, which is proactive measures throughout India with the objective of safety and disaster risk reduction. According petley (2012), the spatial-temporal vulnerability of landslide happening across the world have been described. In

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developed nations such as those in Europe, North America, and japan, landslides have an immediate financial effect. In contrast developing countries, the direct financial consequences is comparatively less. Such assessments provide analysis into prevailing social and economic situation[1337]. According to Kainthola et al.(2025), the quality of publications regarding landslides was gradually increasing until 2018. However, a substantial decrease in such publications was deducted during the 2019-2020 period. The greatest frequency of landslides reaching fifty one was recorded in the Himalayan region and the Western Ghats. In the context of individual states, Uttrakhand twenty three landslides, while Himanchal Pardesh recorded twelve. According to this study, the greater number of landslide data derives from disaster-pron areas[1338]. According to NDMA (reports) data different kinds of disasters are indicated and Technology-driven techniques have also been formulated. The regional vulnerability of India can be displayed that the India plate which is in the northward, moving the direction of China, leads to continuous stress, due to this the rocks lose strength, which enhances landslides and earthquakes and if talk about hilly terrain, then due to the interaction of the Eurasian plate, the hilly terrain found in the Himalayan region are the tallest mountain in the entire globe[1339]. According to Me and Mei (2021), Deep Learning models have been made to handle natural disasters like landslide. This study integrated six primary heterogeneous data sources and seven general deep learning analysis techniques for landslide prediction modeling. These models are applied to tackle disasters such as mass movement, soil flows and seismic events, thereby empowering the detection for future risk prediction and assisting in control of vulnerability [1340]. According to Sahithi et al. (2023), the Random Forest algorithm is designated for the advance predictive capability of disasters. This approach produces results the maximum recorded R2 value of 0.94, as well as the lowest RMSE and MAE scores. Through this method, an early warning system for landslides is incorporated into a Random Forest-based IOT framework; this monitoring of detection approach serves as a authentic and efficient approach for landslide tracking.[1341]

METHEDOLOY

This is a qualitative, secondary data based study. The resources are used include books on environmental pollution, Bare Acts, Research papers, and Wikipedia. Moreover, data has been used sourced from official national and international reports and websites such as the World Landslide Forum, the International Consortium on Landslides, the NDMA, and the SDGs to ascertain the authenticity of this study.

HISTORICAL BACKGROUND

Indian Prospective

In ancient Indian history, there is highlight of protection of the environment and moral obligations towards animals, which are religious texts and are described in the Vedas. If concentrate on Vedic perspective, then for preventive actions, where there was probability of academic break out, medicines were made accessible there. The environment was cleaned through yajna (yagya). When animals harmed from diseases, for its prevention, the environment was cleaned by using Nirjana (cleaning), medical herbs and shelter[1342]. Manusmriti is one of the ethical standards of the environment, which indicate different species of plants and trees, as well as the protection of animals and their survival. If any person damages the environment or animals, then

[1]David Petley, "Global patterns of Loss of Life from Landslides" Geology (2012).

[2] Ashutosh Kainthola, Vishnu Himanshu Ratnam Pandey, et.al., "Evolution and Trend of Landslide Research in India Based on a Decade Long Publication Record"(2025).

[3]Government of India, National Disaster Management Authority (NDMA) available at : https://ndma.gov.in (last visited on March 11, 2026).

[4]Zhengjing Ma, Gang Mei, "Deep Learning for Geological Hazards Analysis: Data, Models, Applications, and Opportunities" 223 Earth -Science Reviews 103858 (2021).

[1341] Sahithi K, Bhanu Prakash Saripalli, et .al., "IOT-Based Landslide Monitoring and Prediction Using Machine Learning" 692 E3S Web of Conferences 03011 (2026).

[1342] Ravi Parkash Arya,"Disater Management: A Vedic Perspective" 2 Towards Unification of Science59 (2023).

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VOLUME 6 AND ISSUE 4 OF 2026

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there is also a clauses for punishment for that person[1343]. According to kautilya's Arthasastra, the king should conduct his duty in which he has been told to secure his subjects from calamities. Misfortune (natural) has been called Daivam or Natural vyasna which cannot be regulated and it has been said that only humans are fully accountable for Manusa vyasna. Also, in the situation of death of layman and a chief person due to diseases, it has been mention that the suffering and loss of a chief person is intolerable and painful in comparison to a layman because the layman are huge in number and all of them are subjects to the chief person[1344].

Global Prospective

In previous Global history, multiple tools and strategies were applied to prevent disasters. China and Japan made the major development, which later led the effective disaster prevention. For the mitigation of the yellow river in china, the least preferred measures. Later, the yellow river also saw the standard practice in construction. This included the integration of double-dike system and supporting systems. In Japan, the engineering of public waterways, known as dike management, started in the Nara era from 710-794, and the Youro Code, regulatory framework was enacted in 757. The Cast ward Diversion Project commenced in 1603 by the Tokugawa Shogunate, was aimed at mitigating inland water transport. In Japan, numerous steps and projects, including water channels, levee construction, mitigated disasters from forming on the land. For the risk-avoidance strategies of disaster, many countries at the global level used some tools and resources to deal with it so that the environment, creatures and natural resources can be saved [1345].

CONCEPTUAL DEFINITIONS RELATED TO LANDSLIDE

Weathering: Whenever a rock, soil and minerals exposure air, water, gas, sunlight and biological organisms, it gradually starts breaking or deteriorating. This procedure is called weathering. In this way, the rock motionless from its place but the process occurs at the same place. The rock and minerals are moved from one location to another by erosion. This is ice, water, wind, waves and gravity which is distinct from erosion.[1346]

Mass wasting: Another name of mass wasting can also be called mass movement. In this process, the force of gravity causes downward movement. This force occurs on the slopes of rock or soil. This means that whenever there is gravitational force on the slopes of rock or soil, it appears to be forcing it downwards mass wasting explain this. This process is distinct from other processes, because it includes creep, soil flow, rockfalls, debris flows and landslides and not water ,wind or ice.[1347]

Erosion: Erosion is a type of surface process in which rocks, soil or dissolved material after coming with the medium like water flow and wind, move from one place and get shifted and deposited at another place. Erosion is different from weathering because it involves the process of movement of material. In physical erosion, soil or rock clastic sediment gets removed. If look at chemical erosion, then soil and rock material is removed through dissolution.[1348]

NATIONAL PROSPECTIVES

Constitution Of India

In the Indian context, landslides are a major natural disaster which is becoming glowingly in mountainous region. Article 21 of the

[1343] Rajani Rao U,"Environmental Awareness In Ancient India" 2 International Journal of Life Science Research 14 (2014).
[1344] Ibid.
[1345] Guangwei Huang,"A Comparative Study on Flood Management in China and Japan" 6 Water 2824, 2825 (2014).
[1346] "Weathering", Wikipedia, https://en.wikipedia.org (last visited on March 13, 2026).
[1347] "Mass Wasting", Wikipedia, https://en.wikipedia.org (last visited on March 13, 2026).
[1348] ."Erosion" Wikipedia, https://en.wikipedia.org (last visited on March 13, 2026).

constitution of India provides for existence of all living beings. Article 39 requires that the state ensure the Accessibility of sufficient resources for welfare of all and monitor their moral and financial conditions in landslide-risk areas. Article 41 mandates that the state within its capacity, provides government aid to the elderly, the sick, the working people, and the educated and disadvantaged in such areas. Article 243G empowers the state legislature to grant panchayat s power related to Schedule Eleven, which deals with the problems in landslide-risk areas, such as small-scale irrigation, drinking water, rural housing, education, fuel and fodder, and family welfare, the state legislature may delegated authority and responsibility on panchayat s for all such matters. Article 243W the Municipalities are authorized by the state legislature to execute works on financial development and social justice, which include work in high-risk areas which related to Schedule Twelve which includes renovating broken roads and bridges, supplying fire services , and organizing plans for socioeconomic development. Article 48A preserves the environment and protect animals and Article 51A(g) fundamental duties to conserve natural forests, lakes, rivers and animals and have concern for them. In case of MC MEHTA V. UNION OF INDIA 1988 1SCC 471 The High Court Ordered that under article 48A The Center, State, and Local bodies should take suitable action to control pollution, and under Article 51A(g), it is the duty of the Central Government to circulate information on environmental protection at least once a week to all academic institution in the country[1349]. The constitution of India has established the authority, rights, policies, duties and responsibilities of the State, District,Villages to ensure living condition, secure life and basic necessities during times of disaster.

Disater Management Act 2005

The Disaster Management Act, 2005 became fully effective on December 23, 2005 its act number is 53. It includes of 10 chapters, such as the scope of the act, definitions, the National Disaster Management Authority, the State Disaster Management Authority, the District Disaster Management Authority , the government's directives on local authorities for disaster management and formation of the National Disaster Response Force, the finance, accounting and audit sections for disasters by the state government and the final chapter includes miscellaneous provisions, which apply from the incident to the prevention and control of landslides. Under section 2(d) of the Disaster Management Act, a disaster is a natural occurrence that causes harm to the environment and human life. The policy development and plans related to landslides at the national level, overseeing decisions and plans by ministers and the establishment of committees. The formulation of national plan a rule related to relief the National Authority for Landslide Relief, the creation of relief camps and the provision of essential food and water resources. Section 46 to 48 provides relief funds, contains the National Disaster Response Funds (NDRF), State Disaster Response Funds (SDRF) and District Disaster Response Fund (DDRF) these policies are constitute by the national government and state governments. Section 24 directs the State Executive evacuation task force, search, and rescue operations in landslide affected or high-risk areas, provide food and medical services to victims and their families at reasonable time[1350]

Disater Management Amendment Act 2025

Disaster management amendment act came into force on 29 march 2025. Many new definitions have been added in it which are most important from aspects of landslides. Section 2(d) the word man-made clause of the definition of "Disaster" has now been elaborated in detail, in which any subject related to law and order, this situation or any such situation which is occurring related to law and order will not fall under the man made clause. Section 2(da)

[1349] The Constitution of India.

[1350] .Disater Management Act, 2005 (Act 53 of 2005).

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VOLUME 6 AND ISSUE 4 OF 2026

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

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"Disaster Database" in which all the systematic analysis of the disaster, details of fund allocation, expenditure, readiness, mitigation strategy and other significant issues in included. Through this definition now entire data of landslides will be retained in the database in a structured manner and monitoring will be feasible. Section 2(ea) "Disaster Risk" the losses that may occur in a defined time frame such as loss of life, injury, damage to property , infrastructure, socioeconomic impact and environmental degradation. These hazards, exposure, vulnerability are used to determine landslide risk areas. Now through this definition, the harm due to landslide can be known in advance. Section2 (ga) "Evacuation" people or their assets in the risk area will be taken to safe location for some time in the event of hazards or before or after the hazards. Section 2(gc) "Hazards" under such process and events which are related to death, injury and impact on human health and property, infrastructure , social economic impact or process of environmental decline due to landslide. Other key definitions are Section 2(oa) "Recovery" and Section 2(ob) "Rehabilitation" includes reviving the economic, social and cultural environment of affected population by the landslide and restoring all essential service infrastructure to them and Section 2(oc) "Resilience" the individual capacity exposed to a hazards to resist, absorb, react, and rehabilitate timely from these problems. Section 2(w) "Vulnerability" a situation in which the socio economic and environmental consequences of a landslide affected people, groups, infrastructure or more vulnerable to the hazards there are other related definitions and sections. Section 5 and 6 which explain the policies and plans of the National Disaster Management Authority which defines the damage zone and the techniques for landslide-affected areas and Section 8(a) and 8(b) which constitute the National Crises Management Committee[1351]

[1351] Disaster Management Amendment Act 2025.

Technical Measures of Landslide

"Geographical Survey Of India" (GSI) is a government-affiliated scientific institution, it was set up in 1851. its work is to collect and examine scientific data of the Earth. This cover finding minerals and performing research studies on natural hazards like landslides and earthquakes. Its role is to reduce the damage and life-threatening harm caused through the examining the landslide and working on the landslide management. Furthermore, on the available information, the danger can be reduced.[1352]

"Early Warning System" (EWS) captures the high occurrence of natural disasters in India like Landslide Lake Outburst Floods (LLOF) and Landslides in the Himalayan Region. It also gives a view of the disaster risk in different area of the country, such as the eastern and western landslide, coasts, droughts etc and the varying levels in different areas of the country.[1353]

"Landslide Sustainability Mapping" of landslide hazards zoning. It essential to follow the guidelines of the national disaster management authorities such maps are made on the scale of 1:500,000 if the scale is area specific, then it can be made. A Geological Project was made for a part of Chamoli distirct (pachuri,1992) of Himalayan Region. It was made after doing Geological and Geotechnical analysis under 1:50,000 scale. Its variables were made after studying it thoroughly. The objectives of such maps is to classify various hazard levels 15% of the land mass maps have been made using this method.[1354]

INTERNATIONAL PROSPECTIVES

UNESCO 1945

UNESCO stands for the United National Educational, Scientific and cultural Organization

[1352] Geological Survey of India, Government of India, Ministry of Mines, available at : https://mines.gov.in (last visited on March 16, 2026).

[1353] Government of India, National Disaster Management Authority, " Training Programme on Early Warning System Report (May 14-16)" , available at : https://ndma.gov.in/ (last visited on March 16, 2026).

[1354] Government of India, National Disaster Management Authority, "Landslide", available at : https://ndma.gov.in/ (last visited on March 16, 2026).

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VOLUME 6 AND ISSUE 4 OF 2026

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In the situation of Environment , it is the world's earliest specialized agency established in 1945. UNESCO maintains links with 194 countries through these connections. The agency promotes globally for the advancement of civilization, knowledge and sustainable development. In doing so, it enhances human rights and peace. UNESCO has outlined plans for addressing environmental natural hazards (such as landslides) and created goals for disaster reduction, specifically highlighting scientific and practical means to reducing disaster risks. At the environmental level, its purposes include preserving and safeguarding biodiversity and cultural legacy, as well as distributing relevant information to public. UNESCO acts primarily through three main bodies: the General Conference, the Secretariat, and the Executive Board. These bodies are responsible for arranging daily operations, making decisions, watching the implementation of decisions across all members countries, and supervising their actual execution. UNESCO also performs the development of environmental projects and the organization of awareness-raising plans. In 2019, UNESCO implemented a gradual approach to its Environment Management System (EWS), designed to actions and management environmental impacts, thereby helping the reduction of such impacts in a arranged and organized manner.[1355]

Stockholm Declaration 1972

The 1972 Stockholm Declaration on the Human Environment took place from 5 June to 6 June. Through this declaration, the whole world was guided and motivated regarding the human environment. It expressed that humanity can effectively apply the benefits of developing its surrounding to improve the quality of life. However, when the humans misuse their power, they risk polluting their environment an act that has a primary impact on their health, as well as their physical and mental well-being.[1356]

World Charter 1982

In general principle 13 of World Charter Of Nature 1982 states that steps designed to prevent or control natural disasters such as landslides should primarily focus on addressing the root causes of these events. Furthermore, it must be ensure that such measures do not have a harmful impact on nature.[1357]

UN Conference 1989

At the 1989 conference on Environment and Development, environmental issues were handled, and the need for their protection was highlighted. Specially, section 15(g) and 15(t) made reference to technological disasters, stating that ecological systems must be safeguarded through the use of scientific and technological resources. Furthermore, it was specified that disasters such as (landslides) should be monitored, assessed, and predicted, and that the promotion of environmental protection should be followed at an international level.[1358]

Rio Declaration 1992

The Rio Declaration, accepted in Rio de janerio from 3 June to 14 June 1992 present 27 principle. Specifically, principle 18 states that in the event of natural disasters such as (landslides) and others, its mandatory to quickly notify other nations. This need applies whenever sudden harm to the environment occurs. Furthermore, efforts should be made to secure total assistance and support from states capable of providing effective international aid.[1359]

Kyoto Protocol 1997

According to article 10(b) of the Kyoto Protocol 1997, all nations will use adoption measures. Which will achieve the goal of adopting technologies and means related to climate

[1355] UNESCO, "UNESCO in brief", available at : https://www.unesco.org (last visited on March 17, 2026).

[1356] Maheshwara Swamy, Law Relating to Environmental Pollution and Protection, Vol. 2 1916 (Asian Law House, Hyderabad 4th edition.,2009).

[1357] Ibid. at 1916.

[1358] Ibid. at 1923, 1925.

[1359] Ibid. at 1930.

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]
VOLUME 6 AND ISSUE 4 OF 2026
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change in the agriculture sector and forestry sector Also, Publish and implement this program. Which will have to give information about the program of developed countries and developing countries. As per Article 12, ensure the communication of parties to use certified project activities and CDM projects and bring adversely Affected Vulnerable Area Countries of developing countries into the adaptation cost.[1360]

Jonhsburg Declaration

The Johannesburg Declaration on Sustainable Development address the problems dealing with the global environment. Biodiversity loss, Climate change, and Natural disasters affect the entire world, particularly developing countries, which are progressively vulnerable.[1361]

International Consortium On landslides

It was began in 2002 by landslide experts with the aim of supporting science and society. The International Consortium on Landslides is a non-governmental international organization. It functions on Landslide research at the environment level. It acts towards capacity development for both society and environment. Geo-science and Technology are used to examine landslides so, that the Natural & Cultural heritage of rural and urban developing areas can be protected for the environment. To form an successful international organization by bringing together international experts so that by conducting through studies in landslide risk assessment, it can support international and national projects which can provide global outcomes.[1362]

7th Word Landslide Forum (2026)

The World Landslide Forum is an international landslide organization. It is a conference series held every three years, which was held in Tokyo, Japan in 2008. through this scientific and technical knowledge of hazard risk reduction is presented globally. For its aligning scientists, policymakers, practitioners and engineers are all internationally associated with this forum. WLF7 will be held from 23rd to 27th November 2026. It will be organized internationally at Amrita Vishwa Vidhyapeetham, Faridabad India on the theme of "Landslide Science and Practice for Safe Resilient Communities. In this landslide hazards, landslide assessment, early warning system and mitigation plans related to Sustainable Development Agenda 2030 will be organized with participants from all over the world. In which Researcher and International Organizations, NGOs, Consultants, all Stakeholders related to disaster risk reduction will be included in the International meeting. And through coordination action on shared points at global and national level, a landslide plan will be prepared which will encourage sustainability.[1363]

Sustainable Development Goals

The Sustainable Disaster Goal 11 talks about "Sustainable Cities and Communities", which aim to reduce disaster risk through future possibilities. So that Sustainable development and disaster risk can be indicated through global strategies and plans of action for social and economic development. So that the relationship between these two can be understood internationally. Reducing the vulnerability of the poor is an need through the 2030 Agenda.[1364]

CASE STUDIES (India , Chaina , Vargas State)

Darjelling, India 1968

The Darjeeling landslide of October 1968 has been assessed as severe. During this landslide, approximately 20 to 25 % of the cultivated area, including tea gardens and agricultural land, and comparatively 2% of the forest area, were washed away and collapsed by the landslide. The massive landslide that occurred in Darjeeling in 1968

[1360] Ibid. at 1940.
[1361] Ibid. at 1968.
[1362] International Consortium on Landslides, "About ICL", available at : https://www.landslides.org (last visited on March 18, 2026).
[1363] 7th World Landslide Forum, "About WLF7", available at : https://wlf7.org (last visited on March 19, 2026).
[1364] United Nations, "The 17 Goals", available at : https://sdgs.un.org (last visited on March 19, 2026).

INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 6 AND ISSUE 4 OF 2026

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involved mud flows and flows in extreme events. During this period, the river and valley floor conditions in Darjeeling changed, and the vertical adjustment reached up to 10 meters. This is why this landslide proved to be a disaster in 1968.[1365]

Vargas, Venezuela 1999

This landslide occurred in 1999 in the coastal area situated to north of Caracas, within the state of Vargas, Venezuela. Heavy rainfall in the region triggered severe flash floods and debris flows. The gradient of the local rivers slopes ranging from 20 % to 25% was a primarily factor contributing to these debris flows and flash floods. Consequently, the landslide claimed the lives of approximately 30,000 people and inflicted extensive damage upon the environment and property in the area. This damage of landscape affecting the hills, rivers, and alluvial fans resulted in a fundamental alteration of their structure composition. Furthermore, the landslide completely devastated hundreds of houses, bridges and various infrastructure facilities. The catastrophe began with the rapid flow of water and culminated in the destructive havoc of landslide itself. [1366]

Zhouqu, China 2010

The Zhouqu landslide stands as one of the most catastrophic disaster on record. The primary cause of this event was prolonged and excessive rainfall. The incident took place on August 8th in Gansu, a province located in Northwestern China. The death

toll reached approximately 1,765, and many people aslo went missing as a result of landslide. The debris flow triggered by the landslide devastated Zhouqu to a significant extent. From the perspective of magnitude, this was an extremely dangerous event, as the volume of the sliding material was estimated at 2.05 x 10^6 cubic meters. [1367]

Kedarnath, India 2013

The Kedarnath landslide occurred in 2013. The land in the Kedarnath region is constantly in movement, making it a dynamic state both geographically and scientifically. This is the main reason why rock falls and debris flows here. The waterways leading to Kedarnath were affected by the landslide. This landslide was caused by the rapid flow (river erosion) of the Mandakini River. This activated the old landslide and triggered a new one. All this happened due to the soil becoming loose and unable to maintain its balance. This resulted in loss of life and property and a devastating scene was witnessed in Kedarnath in 2013.[1368]

ANALYSIS AND DISCUSSION

The grave issue of landslide has been illustrated through a series of case studies. A common factors across all these instances which including (Darjeeling and Kedarnath) in India as well as (Zhouqu and Vargas) in Internationally. It was occurrence of exceptionally heavy rain fall. Consequently, the resulting debris flows and water runoff could not be contained, leading to the tragic spectacle of landslides. A comparative analysis between India and the International sphere reveals that, India, vulnerability was exacerbated by the deteriorating condition of mountain ranges specially in Kedarnath and Darjeeling here unstable soil conditions, and deforestation. At the International level, in regions such as Zhouqu, China and Vargas state, Venezvela the threat stemmed primarily from factors related to river channels and the magnitude of the events. In contrast of India, landslide control in the International cases was more effectively managed through robust disaster preparedness measures. A primarily reason for

[1365] W. Froehlich, E Gil, et al., "Thresholds in the Transformation of Slops and River Channels in the Darjeeling Himalaya, India", 10 Mountain Research and Development 301 (1990).

[1366] M.C. Larsen G.F.Wieczorek, et al., "Natural Hazards on Alluvial Fans: The Debris Flow and Flash Flood Disaster of December 1999, Venezuela", in W.F. Sylva (ed.), Proceedings of the Sixth Caribbean Islands Water Resources Congress (2001).

[1367] Gordon G.D Zhou, Chaojun Ouyang, et al., "Key Laboratory of Mountain Hazards and Earth Surface Processes, Chinese Academy of Science", 36 Mountain Research and Development 166 (2016).

[1368] Aniruddha Uniyal, "Lessons from Kedarnath Tragedy of Uttarakhand Himalaya, India", 105 Current Science 1472 (2013).

the increasing frequency of landslides in developing countries is the rapid urbanization of hilly regions. The disruption of natural landscapes causes the soil in these areas to become significantly. Within legal disaster frameworks numerous status such as India's Disaster Management Act 2005 exist worldwide. However, the ground reality regarding their proper implementation often differs significantly. This disparity is clearly reflected in the extent of the damage caused by

landslides. The entirety of this discussion centers on the failure to adequately manage

rainwater runoff. A failure attributable not only to environmental factors but also to human-built infrastructure. To mitigate the risk associated with landslide disasters, global efforts require proper pubic awareness, strong policy frameworks, and a commitment to sustainable development, thereby enabling us to avert such horrific and tragic catastrophes.

CONCLUSION

This study conducts a comparative analysis of landslide disaster at both national and international level, addressing the obligations associated with ancient environmental conservation practice. It details the construction and measurement methodologies for landslides in China and Japan. This study addresses the global collaborative efforts related to landslides, such as those involving the GSI, EWS, ICL, WLF within the context of sustainable development. As environmental conditions continue to shift due to climate change, there is a need to continuously address the risks posed by landslides through the examination of real-world case studies both in India and International level as well as through the implementation of appropriate legal mechanisms. The analysis presented in this study highlights the issues arising from unplanned structural development in developing nations. Ultimately, this study underscores the critical importance of comparative analysis on landslide. It fosters a fundamental understanding of geographical contexts and risks associated with monsoon induced rainfall, thereby facilitating the global improvement of disaster warning systems and utilization of AI-driven disaster management tools.

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