Reviewing Disaster Management System of Sri Lanka focusing mitigation of impacts related to Floods and Landslides

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1. Introduction

Natural disasters have been on the rise, particularly in vulnerable regions like Sri Lanka, which faces seasonal monsoons, floods, and landslides. Despite efforts to strengthen disaster preparedness after events like the 2004 tsunami, the existing response mechanisms are often inadequate for handling frequent natural calamities. Recent incidents, such as the 2016 and 2017 floods, have exposed weaknesses in Sri Lanka's disaster management infrastructure, highlighting the need for enhanced preparedness, coordination, and timely response. Developing countries, especially in Asia, encounter resource constraints that hinder effective disaster management. This study aims to assess the current disaster management system in Sri Lanka with a focus on preparedness for floods and landslides. The main objectives are: To determine the frequency and impact of hazards, particularly floods and landslides, to evaluate the present state of disaster management and preparedness in Sri Lanka and to identify key issues and gaps within the current disaster management system.This research seeks to provide insights into building a more resilient and responsive disaster management system, potentially informing policy adjustments and resource allocation.

2. Materials and Methods

This research employs both primary and secondary data collection methods to comprehensively examine disaster preparedness in Sri Lanka. The methodology centers on the disaster management system, particularly focusing on the preparedness phase, which is crucial yet often underrepresented in disaster management studies. Secondary data, sourced from academic journals, government publications, news outlets, books, and past research, provides a broad understanding of the disaster management cycle and insights from existing literature. This phase of data collection enhances understanding of critical disaster management phases, such as mitigation, response, recovery, and preparedness, specifically highlighting how Sri Lanka's institutions operate within these phases.

To deepen the analysis, the research identifies and studies key institutions in Sri Lanka's disaster management framework, particularly those active in preparedness. Observing these institutions' roles, relationships, and challenges within the preparedness phase reveals gaps and potential areas for improvement. Recognizing the complex, cyclic nature of disaster management across different countries, the study focuses on the unique context of Sri Lanka, analyzing how prompt information-sharing and institutional support are crucial in minimizing disaster impacts. Based on findings, the research provides recommendations to strengthen the preparedness phase in Sri Lanka, proposing strategies for more robust disaster management to mitigate future risks effectively.

3. Results and Discussion

When considering the first objective Sri Lanka been an island in the Indian Ocean is mostly vulnerable for natural disasters. To take an overall idea regarding the disasters in Sri Lanka it's very important to study the frequency of natural disasters in Sri Lanka. According to Figure 02, highest damage happen because of the drought in Sri Lanka. Then second highest number of affected people were reported from flood in Sri Lanka. That value got as 14445496.Then

second and third highest values were shown the disaster happen by cyclone and Tsunami. That vales get sequent 1369376 and 1076240. In this study mainly focus about flood and landslides. Number of Affected people by landslide was 288908.

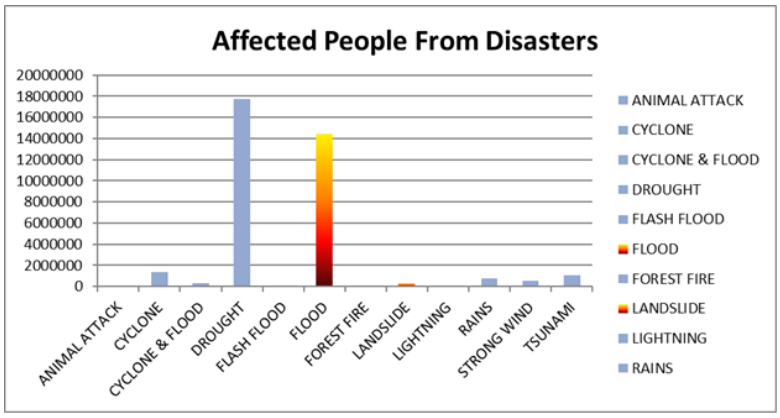

Figure 01: Number of affected people in 1965-2017 from all Sri Lankan disasters
Source: Disaster management center

To evaluate the current state of disaster management and preparedness in Sri Lanka and identify key issues and gaps, this study focuses on the impact of natural disasters, particularly floods and landslides, on human lives and property. Floods and landslides are common and devastating in Sri Lanka, exacerbated by the country's river basins and increasing urbanization without proper drainage systems. Key flood-prone districts include Kegalle, Ratnapura, Kalutara, Colombo, Gampaha, and Galle during the Southwest monsoon, while Ampara, Trincomalee, and Batticaloa are vulnerable during the Northeast monsoon (Disaster Management System, 2013). Landslides, especially in mountainous regions like Kandy, Ratnapura, and Nuwara Eliya, have increased due to deforestation, unplanned land use, and changing land practices (Gunathilaka, 2015). Factors such as tobacco cultivation, land clearing, and reservoir construction have further raised landslide risks (Herath, 2016).

Data shows that during 2016-2017, there was a significant increase in deaths, missing persons, and injuries, with the highest death toll in 2017 (67), and the most missing persons in 2016 (117) (Center, 2011). Injuries peaked in 2006 with 57 people injured, followed by 28 in 2007 (Gunathilaka, n.d.). Landslides have caused substantial damage to homes, with the most damage recorded in 2006-2007 and 2016-2017. The highest number of damaged houses (2,018) occurred in 2006, while 495 houses were destroyed in 2007 (Disaster Management, n.d.).

Sri Lanka's disaster management framework includes the National Council for Disaster Management (NCDM), which formulates disaster policies, and the Ministry of Disaster Management, which coordinates responses through various agencies like the Department of Meteorology and the National Building Research Organization (NBRO) (Carter, 2008). The Disaster Management Center (DMC) is the lead agency, coordinating national and sub-national programs aimed at reducing disaster risks through mitigation, public awareness, early warning dissemination, emergency operations, and relief coordination. The Department of Meteorology plays a crucial role in preparedness by providing meteorological and climatological services and early warning systems. It collects and analyzes data on rainfall, agro-meteorology, and climate, contributing to disaster risk reduction efforts (Department of State Development, Infrastructure, and Planning, 2013).

Despite progress, challenges remain in implementing a fully integrated disaster risk reduction (DRR) strategy. The focus leans toward disaster response rather than proactive risk reduction, with limited institutional support and inadequate engagement of key ministries, which weakens coordination and the comprehensiveness of disaster management plans (Gunathilaka, 2015). Capacity building is also hindered by a lack of credible research, training, and user-friendly tools, creating gaps in early warning systems and preparedness. Issues such as political

instability, inadequate risk assessments, and unplanned settlements worsen the situation (Carter, 2008).

To address these challenges, Sri Lanka has launched disaster projects like flood mitigation in Kalutara, Dambulla, and Jaffna, and landslide prevention in Kothmale and Punchiraththota. The DMC has introduced a disaster communication system, including early warning towers and satellite communication to alert vulnerable communities (Disaster Management System, 2013). The Sri Lanka Comprehensive Disaster Management Programme (SLCDMP) for 2014-2018 aimed to integrate DRR and climate change adaptation into development processes, promoting resilient communities. However, more work is needed to fully integrate DRR into national planning, improve government coordination, and raise public awareness to create a more disaster-resilient Sri Lanka (Herath, 2016).

4. Conclusion

The qualitative analysis focuses on flood and landslide risks in Sri Lanka, revealing challenges in disaster management. Despite warnings, people are reluctant to leave their traditional lands, which indicates a need for changing public attitudes. The current disaster warning systems are ineffective, especially as victims increase. Urban planning outside main cities is inadequate, making recovery efforts difficult. The analysis stresses the importance of identifying disaster risk areas, improving planning, and enhancing response measures. Empowering village committees and Relief Service Offices for quick disaster response is essential. Increased public awareness, particularly in schools and communities, about disaster prevention and response is recommended. Establishing software for swift data collection and effective post-disaster services should be implemented nationwide.

Learning from other developing countries, acquiring advanced disaster management technology and equipment is necessary for both pre- and post-disaster stages. A national program to educate people on disaster threats and gather their input should be conducted. Urban areas need systematic planning to reduce flood impacts and protect property. Furthermore, the Sri Lankan army should be trained and equipped with modern tools to assist in disaster situations and lead preparedness programs for civilians, ensuring a more effective national response to future disasters.

5. Acknowledgment

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6. Keywords

Disaster Management , Preparedness, Resilience, Risk Reduction

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Role of the Colombo Port City in the Development of the Sustainable Blue Economy Concept in Sri Lanka: Lessons from the European Union

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1. Introduction

The ports and shipping lanes have long provided the platform for political and trading empires, where the collaboration between political and economic forces has been governed by the political leadership at the time. As a result, majority of port cities are metropolises. World-class port cities oversee a vast network, serve as cultural hubs, and pioneer new cultural, political, economic, and social practices. Therefore, port city concepts around the world are currently following a new and narrow path. Port cities continue to produce innovative architecture and urban planning while also manifesting the spatial impact of globalisation. Consequently, new projects in port cities are often complex.

On September 17, 2014, the Colombo Port City Project made its debut. This development project has contributed remarkably to the GDP by generating a number of employment opportunities and attracting foreign direct investments to the country. However, it has faced scrutiny for its procedural aspects and it remains to be seen whether the Port City Project can achieve sustainable development and positively impact the Sri Lankan economy within the framework of the sustainable blue economy. It can be noted that there is uncertainty about the project's ability to achieve sustainable growth and contribute to the Sri Lankan economy within the Sustainable Blue Economy. The Sustainable Blue Economy Concept has been well developed in the European region, and smart green ports are popular and have been successful in some member states. Sri Lanka, a developing island nation along the historic silk route, should prioritize the adoption of the sustainable blue economy concept through the PCP for sustainable growth.

This paper aims to analyse the growth of the Coastal and Marine Conservation and Protection (CPCP) program by addressing the current deficiencies in the context of the Sustainable Blue Economy Concept. It also investigates whether the program effectively contributes to Sri Lanka's sustainable development objectives. Furthermore, this research aims to analyze the future obstacles faced by the Colombo PCP and propose strategies to overcome these issues through the implementation of the Sustainable Blue Economy concept and advanced technology.

2. Methodology

The qualitative research method, which is based on primarily legal sources such as the Constitution of The Democratic Socialist Republic of Sri Lanka, national legislations particularly the Colombo Port City Economic Commission Act, No. 11 of 2021, The Sri Lanka Sustainable Development Act, No. 19 of 2017, The Marine Pollution Prevention Act, No 35 of 2008, The Sri Lanka Ports Authority Act, No. 51 of 1979, Superior Courts Judgments including the determination of the Supreme Court on the Colombo Port City Economic Commission Bill, international legal instruments such as the EU strategy for cooperation in the Indo-Pacific (Hereafter referred to as "EU strategy") and commission reports published by the EU Parliament and secondary legal sources such as scholarly books, journal articles, newspaper