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Article

A Systematic Review of Disaster Risk Reduction and Management Policies and Practices in Nepal

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Abstract: Globally, Nepal is ranked 4th in terms of vulnerability to climate change and 11th in terms of vulnerability to earthquakes. The systematic review aims to examine the existing regulatory framework, policies, plans, and organisational aspects of the disaster risk reduction and management in the Government of Nepal, and provide insights for their effective implementation. The modified Institutional Legislative System (ILS) was employed as a framework to examine current disaster risk reduction and management policies and practices in Nepal. The study highlights the qualitative data from the original research, which was carried out utilising a qualitative systematic review. The data was analysed and presented through a content analysis approach. The study result revealed that there are available relevant policies, acts, and legal instruments for disaster risk reduction and management in Nepal; however, institutional capacity was found to be weak for effective implementation. The functions and duties of the different levels of government are clearly defined in policies; however, their capacity and accountability mechanisms are poor. Moreover, not clearly mention the vulnerability and inclusive issues in existing Disaster Risk Management (DRM) policies. The study found extant literature on Nepal's context in laws and policies on disaster risk reduction and management in general, but found limited literature on empirical research and implementation status at the ground level.

Keywords: Disaster; Risk Reduction and Management; Policies; Practices

1. Introduction

Epidemics, earthquakes, landslides, floods, fires, cold and heat waves, and other types of disasters were among the many environmental effects and hazards that Nepal faced [1,2]. Natural hazard occurrences are influenced by and made worse by environmental deterioration and climate change [3]. Rapid, unplanned urbanisation and environmental deterioration have increased Nepal's vulnerability to disasters [3]. Nepal is ranked fourth and eleventh in the world for its relative susceptibility to earthquakes and climate change, respectively. The capital city of Kathmandu is the most vulnerable to earthquakes among the 21 cities in the world that are located in comparable seismic high-risk zones [4]. Two strong earthquakes struck Nepal in 2015, killing 8,790 people and injuring 22,300 more;

estimated that eight million, roughly one-third of Nepal's population, have had their lives affected by these disasters. Damage and losses are calculated at US$7 billion [5]. With Nepal's worst rains in 15 years in August 2017, life, livelihood, and infrastructure were severely disrupted in 35 out of 76 districts, mostly in the Madhes/Terai districts [4]. The government and communities frequently fail to address reducing the vulnerability of people, structures, and systems to respond to severe disasters before they happen, which leads to the size of the disaster.

Governance is a fundamental component of an effective disaster risk reduction and management system. UNDP has developed and reviewed its global support using the Institutional and Legislative Systems (ILS) Framework for Disaster Risk Management [6], which include, policy and planning, legislation, resources, organizational structure, and normative framework. The researchers have modified and adopted the ILS framework to review systematically the DRM governance system in Nepal. The content analysis review approach was used to analyse the data. The analysis process consists essentially of (i) data extraction in answer to the question - to what extent is a policy instrument employed – and (ii) identifying characteristics in each theme using content analysis of each included article in the study.

2. Literature Review

Nepal has ratified international and regional climate change accords, as well as the Sustainable Development Goals (SDGs) (2016–2030) and the Sendai Framework for Disaster Risk Reduction (SDRRR) (2015–2030). In 2015, the Federal Democratic Republic of Nepal was founded, with three levels of government and defined various roles and responsibilities for Climate Change (CC) and Disaster Risk Management (DRM) [7]. As a result of the restructuring system of governance, Nepal has been able to institutionalize a decentralized system of climate change and disaster risk reduction and management. By passing DRM and CC-related legislation, the Government of Nepal (GoN) has created an enabling environment for these sectors. There are specific tasks and responsibilities assigned to different levels of government institutions to carry out DRM activities in Nepal [1]. A DRR focal point is assigned to each layer of government. Each province's Ministry of Internal Affairs and Law has its own DRM division. Although Nepal has made progress in developing an institutional framework for DRM, institutionalization and capacity development at all levels of stakeholders must be strengthened [8].

In 2017, the Government of Nepal released the National Urban Development Strategy (NUDS), which highlighted the five major sectors (physical, social, economic, cultural, and environmental) as well as specific metrics for improving urban resilience [9]. The National Disaster Risk Reduction Policy, 2018, highlights how disaster risk reduction helps long-term development by making the country safer, more climate-adaptive, and disaster resilient [7]. There is a lack of required knowledge and skill on DRM, particularly at the provincial and local level' staff. Local governments must provide access, representation, and meaningful participation of disadvantaged and marginalized people in the development planning process [10,11].

Nepal has formulated and implemented policies to address the most important issues of poverty, food security, education, and environment [12]. Nepal is a member country to implement the Sendai Framework for Disaster Risk Reduction (SFDRR 2015–2030), which was prepared after completing the tenure of the Hyogo Framework of Action (HFA) 2005–2015 [13]. These international documents are widely adopted by the United Nations member countries, including Nepal. The Sustainable Development Goal (SDG) 2030 highlights the clear connections between disaster risk reduction and climate change adaptation in SDGs 2 and 11, which are zero hunger and sustainable cities and communities, respectively [14]. In Nepal, the national strategy for disaster risk management is considered a key document for the DRM sector in Nepal [15]. Nepal was formally established as a Federal Democratic Republic with three levels of government in 2015 under the country's new Constitution. According to the new constitution, local governments are solely responsible for DRM, while the federal and provincial governments also have a shared responsibility, as per the nature of the disaster. There are one federal, seven provincial, and 753 local governments (293 municipalities and 460 rural municipalities) as stipulated in the constitution of Nepal. Local governments now have the full-fledged responsibility for development and service delivery functions in all sectors [16].

At the national and international levels, disaster preparedness and management are considered as major components in developing policies and plans [17]. A community-driven approach is considered successful in disaster preparedness and response [18]. There is a limited opportunity for review and sharing learning among the practitioners and policymakers on policy challenges and opportunities in disaster risk governance [17]. The study results revealed that the local governments are more focused on infrastructure projects without due consideration of dis-

aster risk reduction measures [19]. Additionally, because of gendered social norms and a lack of gender sensitivity in policy making, women are more physically vulnerable to disasters, including flooding [20]. Over the past few decades, countries worldwide have focused on establishing institutional DRM mechanisms. The majority of countries in Asia and Pacific region developed institutional and legislative frameworks for disaster risk management following the 2004 Indian Ocean Tsunami [21].

The researchers have reviewed the scholarly articles and identified the gaps in disaster risk reduction and management policies and practices, and suggested improvement areas for effective planning and implementation.

3. Materials and Methods

The study was conducted using a qualitative systematic review [22] and primarily emphasises the qualitative data from the initial research. Researchers have created several qualitative synthesis techniques, such as thematic synthesis, critical interpretative synthesis, and meta-ethnography [23]. Guidelines from the Cochrane Qualitative and Implementation Methods were followed in conducting the systematic review [24]. Additionally, the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement served as a guide for the identification and selection process [25]. The modified PRISMA flow diagram is shown in **Figure 1**.

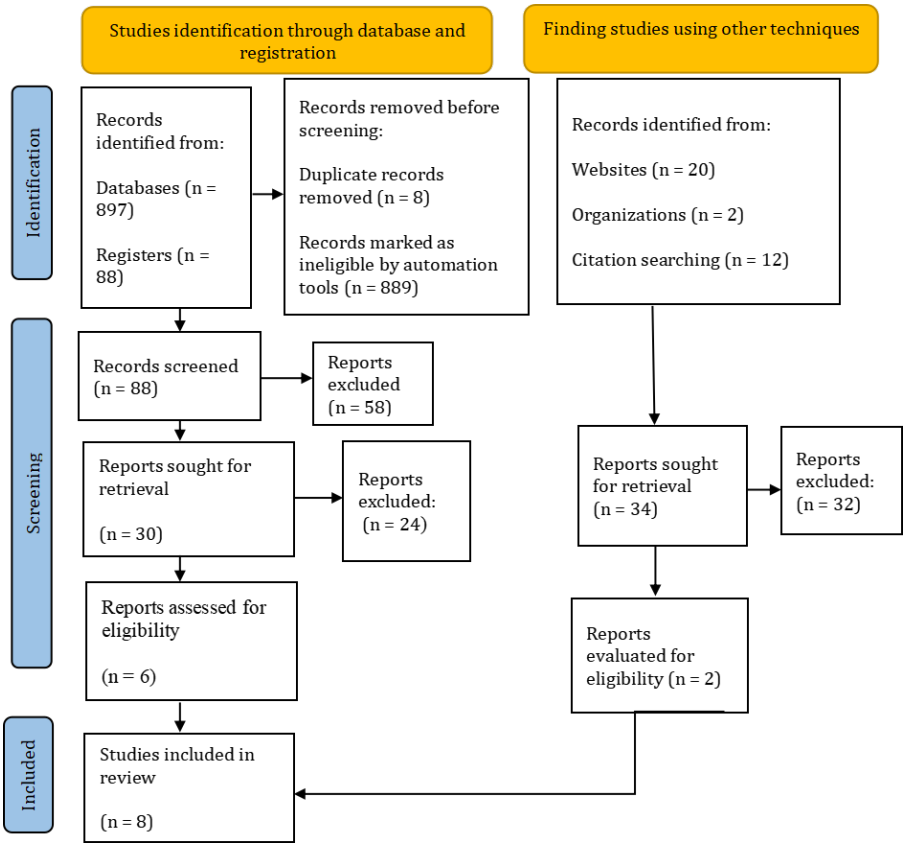

Figure 1. The modified PRISMA flow diagram.

3.1. Review Approach

UNDP Bureau for Crisis Prevention and Recovery (BCPR) defines ILS as a system of organisational structures, mechanisms, processes, strategies, policies, laws and regulations, resources, and procedures at all levels of administration that govern the nation's approach to disaster risk management [6]. As mentioned in **Figure 2**, the modified framework includes legislation, policy and plans, organizational aspects, and resources/partnerships, which helped to identify gaps and hint at strategies for effective disaster risk reduction and management in Nepal.

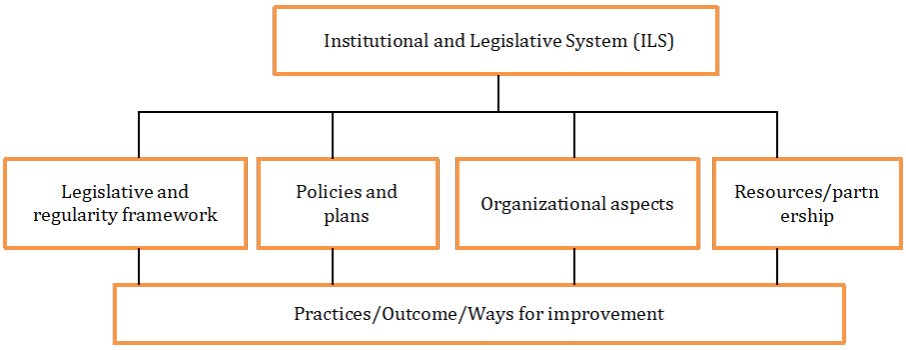

Figure 2. The modified Institutional and Legislative System (ILS) framework.

3.2. Search Strategy

PRISMA was adopted as a search strategy tool for systematic review and for data collection [26]. PRISMA for data collection, which encompasses inclusion, screening (establishing eligibility standards), and identification. Keywords and related terms that were developed based on the recommendations of experts and earlier research [27]. The selection of keywords is a crucial step in conducting a systematic literature review search [28]. The primary focus of the search was on specialised electronic libraries and major electronic databases, including Semantic Scholar, JSTOR, Scopus databases, and Research Gate. In the search string, among the terms used in the main search are [disaster AND risk* OR reduction* AND management*]; OR [policies* AND practices*Nepal*] (2008–2022/02). The AND OR "*", except for hand search documents, operators were utilised and approved in significant databases.

3.3. Inclusion and Exclusion Criteria

The purpose of developing the inclusion and exclusion criteria is to reduce the number of studies identified during the primary search. The inclusion/exclusion criteria were: (i) the researchers included the journal articles directly related to the policy, legislation, and institutional aspects of DRRM, whereas the journal articles related to field interventions for preparedness and mitigation were excluded; (ii) studies between 2005/01 and 2022/02 were included whereas studies conducted before 2005 were excluded; (iii) studies conducted in Nepal were included and studies conducted outside the country were excluded in analysis of ILS characteristics and; (iv) studies written in English were included whereas the studies written in the other languages were excluded.

3.4. Data Extraction and Synthesis

The researchers used the content analysis review method to analyze the acquired data. The process of analysis mainly includes the (i) data extraction as per the initial question - what level of policy instrument is brought into practice. As stated in the ILS framework, the researchers modified and categorized the legislative and institutional characteristics into four themes, and (ii) listed the characteristics in each theme using the content analysis of each included article, and showed using yes for positive and no for negative responses.

3.5. Quality Appraisal

The quality appraisal tool developed by Itad and modified by Mader et al. was adapted for this study [29]. The tool was initially developed to assess the quality of primary evidence; the researchers modified this tool to make it fit for purpose for review-level evidence. This tool includes the following three domains:

1. Cogency: Does the study present a convincing causal argument? Is it causal? Is it theoretically grounded?
2. Transparency: How was the data collected? Were pre-specified eligibility criteria in place? How were the data analysed?
3. Credibility: Are the findings generalisable? Is the research process logical, traceable, and documented? Is there a clear description of how conclusions and interpretations were reached?

Each included study was assigned a grade for each of these domains; a study could be awarded a grade of up to 6 (i.e., 2 points per domain). If a study only partially met a dimension within one of these domains, then a point of 1 was assigned, or 0 if it failed to meet any of the dimensions within any of these domains. The study below 3 points is supposed to be rejected. But, all studies met the quality standard i.e, above 4. These studies specifically used robust methodology, analysed data and results presented systematically with a conclusion and recommendation in line with the research questions. However, few studies adopted grey literature while reviewing the research papers.

4. Results

4.1. Study Descriptions

A total of 985 articles were obtained from the primary data sources, and 34 policy-related documents were obtained from the websites of the United Nations, the Government of Nepal, and pertinent international and national non-governmental organisations. Out of the total articles and reports/policy documents generated from the database search with title and abstract screening, a total of 64 articles/documents had a full-text screening, leading to 8 articles included in the analysis [8,10,30–36]. Only the published articles were included to ensure the quality and reliability. Characteristics of the included studies are given in **Table 1**; out of 8 studies, 3 discussed floods, 2 discussed earthquakes, and 3 were relevant to all types of disasters.

Table 1. Characteristics of the included studies.

Study	Study Objective	Study Sites	Disaster Type	Data Collection	Methodology	Analysis
Gade et al. [30]	Risk governance across trans boundary nations	Nepal (Saptari) and India (Supaul)	Flood	Interview, observation and focus group discussion	Empirical research	Content analysis
Gyawali et al. [8]	Decentralisation of disaster risk reduction policy	Saptari and Nawalparasi	Flood	Interview, observation, focus group	Empirical research	Content analysis
Jones et al. [31]	Policy process and the governance of DRR	Nepal	All kind	Interview, second-hand information	Case study	Content analysis
Melis, S. [32]	Examine how assistance actors can respond to disasters in a post-conflict environment	Gorkha, Kathmandu and Sindhupalchwok	Earthquake	Interview, focus group discussion	Empirical research	Thematic analysis
Nepal et al. [33]	Policies and institutions on disaster risk reduction	Nepal	All kind	Investigate, second-hand information	Policy review	Content analysis
Shrestha et al. [34]	Identify the key reasons for the failure of flood management in Kosi	Sunsari/Nepal and Birpur/Bihar, India	Flood	Interview, second-hand information	Empirical research	Content analysis
Thapa, B & Pathranarakul, P. [10]	Gender-sensitive/inclusive disaster risk governance	Kathmandu Valley	Earthquake	Interview, focus group discussion	Mixed method	Content analysis
Tuladhar, G. [35]	Policy issues and solutions on DRR	Nepal	All kind	Investigate, second-hand information	Policy review	Content analysis

4.2. Characteristics of the Institutional and Legislative System of Included Studies

The current laws, regulations, and institutional structures in disaster risk reduction and management were examined using the modified ILS framework [6]. Accordingly, this review pointed out that the government set out laws and regulations on DRRM to assign authorities and responsibilities for different levels of government. The modified legislative and institutional system framework was used for analysis. The characteristics and outcomes in the literature were extracted and presented in **Table 2**.

Table 2 shows that 87% of studies mentioned disaster acts and regulations. Similarly, 50% of studies mentioned acts related to watershed conservation, water resources, environmental protection, building construction, and local government operations that contributed to disaster management. Similarly, 75% of studies mentioned that there are national policies and strategies such as the national strategy for disaster risk management, the national adaptation program of action, and the national disaster response framework. These policies and strategies primarily focused on preparedness and the Disaster Risk Reduction (DRR) approach, but found a low level of practice at the ground level. Similarly, 50% of studies mentioned the integration of risk reduction and development planning and the multi-sectoral approach, which are quite essential for effective implementation. Only 25% of

studies [10,31] mentioned the promotion of DRR along with the reconstruction process. Similarly, 25% of studies [30,33] mentioned regional cooperation and funding, particularly in transboundary issues. All 8 reviewed studies mentioned a few or more characteristics related to organisational structure, resources, and partnerships that are needed for the effective implementation of disaster risk reduction policies and plans. The studies also mentioned that their institutional capacity is limited to implementing the policies and plans effectively.

The Government of Nepal has created an enabling environment by enacting various DRM legislation and regulations; however, it needs to review and strengthen legal policies on vulnerability and inclusiveness issues. The study results revealed that various policies and plans for disaster risk reduction and management; nevertheless, the institutional capacity of different levels of government for successful execution is lacking. The study result revealed that the organizational system and structure are in place, and the roles and responsibilities of different levels of government, but the capability for effective implementation is inadequate.

Table 2. Types and characteristics of the institutional and legislative system of the included studies.

ILS Characteristics	Frequency (Y = Yes; N = No)									
	Gyawali et al. [8]	Gade et al. [30]	Melis, S. [32]	Nepal et al. [33]	Thapa,B. & Pathranarakul, P. [10]	Jones et al. [31]	Tuladhar, G. [35]	Shrestha et al. [34]	Total (Y)	Percentage
Legislative and Regulatory Framework										
Acts and regulations on DRRM	Y	Y	Y	Y	Y	Y	Y	N	7	87
Acts related to soil and watershed conservation, water resources, environmental protection, and building construction	N	Y	Y	Y	N	N	N	Y	4	50
Acts for local government operation	Y	N	Y	Y	N	Y	N	N	4	50
Disaster fund regulation	Y	N	N	Y	N	N	N	N	2	25
Treaty between India and Nepal	N	N	N	N	N	N	N	Y	1	12.5
Policy and Planning										
National policies and strategies such as the National Strategy for DRRM, NAPA, National Framework of LAPA, and NDRF	Y	Y	N	Y	Y	Y	Y	N	6	75
Integration of risk reduction and development planning and multi-sectoral approach	Y	N	N	Y	Y	Y	N	N	4	50
Promotion of DRR and the reconstruction process	N	N	Y	N	Y	N	N	N	2	25
Regional cooperation and funding	N	Y	N	N	Y	N	N	N	2	25
Organizational Aspects										
Implementing and coordinating mechanism	Y	Y	Y	Y	Y	Y	Y	Y	8	100
Decentralization, civil society, community participation, and local institutions	Y	Y	Y	Y	Y	Y	Y	Y	8	100
The inter-ministerial, multidisciplinary approach	Y	Y	Y	Y	Y	Y	Y	Y	8	100
Resources/Partnership										
Resource mobilisation and allocation, financial, human, technical, and material support	Y	Y	Y	Y	Y	Y	Y	Y	8	100

5. Discussion

5.1. What Level of Policy Instrument Was Brought into Practice?

The review analysis and findings found that there are formulated regulatory frameworks and an institutional setup in Nepal. Strong national commitments to disaster risk reduction and management are exemplified by national policies [6]. Confirmation of such a regulatory framework and institutional setup is discussed in the sections below.

5.1.1. Legal and Regulatory Framework

Various Acts are enacted in Nepal to protect and conserve natural resources and reduce the negative impact on the environment; some of them are mentioned here. The Soil and Watershed Conservation Act (1982) was formulated to protect land and watersheds by lowering the frequency of natural disasters, including floods, landslides, and soil erosion. The Water Resources Act (1992) protects water resources against contamination to prevent negative effects on the environment and other harmful consequences. The Environment Protection Act (1996) stipulates that a project's environmental impact must be evaluated before it is implemented. Building construction activities are regulated by the Building Act (1998) to safeguard buildings from natural disasters such as fire, earthquakes, and other incidents. The Natural Calamity (Relief) Act 2039 (1982) was superseded by the Disaster Risks Reduction and Management Act of 2017, which recognised that disaster resilience could be achieved by effectively and efficiently protecting people's lives, private and public property, natural and cultural heritage, and physical structures [7]. The act supports government efforts to focus more on preparedness and risk management. An enabling environment has been created by formulating a regulatory framework; however, the community at risk is receiving less attention [8].

Though efforts have been made to formulate the act and policies on disaster risk reduction and management in Nepal, implementation at the ground level is very slow. Hence, the researchers have reviewed the existing policies and suggested strategies for better implementation of disaster risk reduction and management, focusing on vulnerable communities.

5.1.2. Policies and Plans

Policies, strategies, and plans are interrelated with legislation to define roles and responsibilities. There are significant improvements in developing policies and strategies for DRRM in Nepal. Here, we covered the main plans, programs, and strategies that the Government of Nepal (GoN) has created and put into practice. The GoN developed and endorsed the National Strategy for Disaster Risk Management (NSDRM) in 2009, a long-term framework in line with HFA. The National Adaptation Programs of Action (NAPA) was prepared by the GoN to evaluate climate vulnerability and systematically address climate change adaptation challenges by creating suitable adaptation measures [36]. Similarly, the GoN has developed and implemented the national disaster response plan and framework for the efficient planning and execution of disaster preparedness and response activities in close coordination with the government and non-governmental organizations [37].

The 2015 Land Use Policy concentrated on making use of lands and land resources (LLRs) by establishing a condition where lands are distributed fairly. Only directed activities will be carried out in designated regions where potential risks may occur [38]. The GoN created the Post Disaster Recovery Framework (2016–2020) in the wake of the Nepal earthquake on April 25, 2015, with an emphasis on capacity building, safe structures, social cohesion, service accessibility, and livelihood assistance [39]. The National Urban Development Strategy (2017) outlined the five overarching sectors—physical, social, economic, cultural, and environmental—as well as particular metrics for enhancing urban areas' resilience [9]. The National Policy for Disaster Risk Reduction (2018) was envisioned to make the country safer, more climate-adaptable, and more robust to disaster risk to support sustainable development [7]. The existing policies and plans have shifted from relief to disaster risk reduction and preparedness; however, benefits to the vulnerable communities are still limited [10,30]. Hence, the different levels of governments have to give due focus to localising these policies, considering communities at risk practically. Understanding of gender sensitivity in policies was found to be less focused [10]. There are still gaps in formulating local policies and guidelines to address the needs and concerns of the most vulnerable people [8].

Community-Based Disaster Risk Management (CBDRM) is a vital aspect of DRM to enhance the knowledge and skills of vulnerable communities to increase their resilience against hazards and disasters [18]. The studies revealed that there are gaps between policy and action in the disaster risk reduction sector in India, Shrilanka and Pakisthan ; however, comparatively good in Bangladesh [40,41].

5.1.3. Organisational Aspects

As the lead organisation, the Ministry of Home Affairs (MoHA) develops and carries out strategies and policies for DRRM in Nepal [35]. The legal foundation for instituting DRRM in Nepal has been made by the constitutional

provisions about the shared responsibility of all levels of government [3]. The Prime Minister chairs the DRRM Council, which is established by the DRRM Act as the nation's top policy-making body. In a similar vein, disaster management committees at the provincial, district, and local levels are available. These committees are presided over by the chief minister, chief district officer, and mayor or chairperson of the respective institutions, respectively. Additionally, the National Disaster Risk Reduction and Management Authority (NDRRMA) is recognised by the DRM Act as a distinct organisation to oversee DRRM in the country [1]. Development plans incorporated the DRM and climate adaptation program to lessen the impact and implement mitigation strategies to lower future risk [3]. The Department of Hydrology and Meteorology (DHM) is responsible for gathering and evaluating meteorological and hydrological data as well as communicating information on water outflow, weather predictions, and early warnings. Sectoral ministries can benefit from DHM data, especially when it comes to planning and managing water resources, agriculture, energy, mountaineering, civil aviation, and disaster relief. It has installed early warning and flood monitoring systems in Nepal's main rivers, which have proven extremely successful in saving lives during monsoon floods [4].

The NSDRM is predicated on mainstreaming disaster risk reduction (DRR) in plans and policies and institutionalising disaster management units at the local and central level government [15]. Although there has been significant progress in creating the institutional framework for responding to DRR, institutionalisation and the ability of various stakeholder levels to function together still require improvement [8]. There is a complex nature of coordination mechanisms and institutional setup in the case of transboundary nature of a transboundary project, such as the Kosi project, where decisions were made at a national level; local government, local people, and civil society were not included in the decision-making process [34]. Despite the moral requirement for Nepal's sovereign government, the Kosi project's institutional architecture does not permit implementation roles.

Disaster risk is continuously increasing in Nepal, and the most vulnerable people. In Nepal, there is a good community-based structure to cope with disasters, and these practices should be implemented at all places [18]. In contrast, another study's results revealed that the community-level DRM structures are rarely found except in donor-funded projects and locations, which limits the involvement of local communities in planning and managing disasters at the community level [19]. Moreover, other studies revealed that there are found overlapping roles and authorities between different level of institutions, lead to create competing roles and confusion during planning and response in disaster [21,41].

5.1.4. Resource/Partnership

Disaster Risk Reduction and Management Act, 2017, and Post Disaster Recovery Framework (PDRF) were developed to advance all disaster management initiatives in a coordinated way [42]. Generally, the national disaster management system has focused on large-scale and episodic events, such as earthquakes and floods that produce large-scale damage, warranting the declaration of emergency and external assistance. Contrarily, numerous small and medium-scale hazardous events occur more frequently; these often tend to be ignored by the local government and administration. MoHA is responsible for leading and implementing the DRRM Act 2017. MoHA is also in charge of gathering and disseminating data, conducting rescue and relief operations, and gathering and allocating finances and resources. In the event of a disaster that exceeds the capabilities of the provincial and local governments, it is also the primary organisation for logistics management. Nepal has adopted and localized the SFDRR (2015–2030) by developing the National Disaster Risk Reduction Strategic Plan of Action (2018–2030), which has identified 272 priority activities to be implemented in a coordinated manner [43]. The progress has not been observed at the expected level due to a scarcity of resources and a low level of political commitment.

The knowledge and resources offered in DRR are not utilized fully as per the disaster management cycle, which is more emphasised on response-centric [8]. Mainstreaming DRR into the development process will increase the effective implementation of resources. Considerable efforts can be made in mainstreaming DRR if there are dedicated efforts demonstrated by the different levels of stakeholders [31]. This is important to strengthen disaster risk reduction and management through inter-disciplinary and multi-sectoral approaches [6].

The implementation of DRR strategies and programs and the development of capability require a regular budget [10]. All levels of government have set aside money for disaster management, which they use to respond and distribute relief materials; however, resources for capacity building and preparedness are not planned and implemented properly [17].

5.1.5. Ways to Improve the Implementation Strategies for Effective Disaster Risk Reduction and Management

The organisational structure and the tasks and responsibilities of the concerned ministries are mentioned in policies to carry out DRRM initiatives in a coordinated way. There is a dedicated desk in the federal ministries and departments, and the DRR focal persons at each level of government. The Ministry of Internal Affairs and Law has a distinct DRM section in each province. To improve the response effort at the municipal, district, provincial, and federal levels, Emergency Operation Centres (EOCs) must be set up and functional. The International Organization for Migration (IOM) study shows that Local Emergency Operation Centers (LEOC) were not established and functional as envisioned due to inadequate equipment or trained staff [11].

It is necessary to further deepen sector integration and the institutional arrangements between the relevant ministries and departments. The nation cannot afford for core development, DRRM, and climate adaptation to be carried out concurrently and with overlap. The time has come for development organisations and national and local stakeholders to reconsider the earlier methods and strategies for reducing risk and enhancing climate change and disaster resilience [44].

Key employees and elected officials at the municipal and ward levels of local government should be trained in multi-hazard-based disaster risk mapping, and their DRRM legislation and policy papers should incorporate this information. It is important to ensure mainstreaming of DRRM into the development planning process in an inclusive way. This can be guaranteed by ensuring that vulnerable groups, including women, children, people with disabilities, old age citizens, and marginalised and minority communities, are represented, accessible, and actively involved in the local development planning process [11]. The public and commercial sectors may try to develop disaster resilience in a patchwork fashion if the various stakeholders don't work closely together, which could lead to gaps and overlaps in the efforts" "[45]. The allocated DRRM fund by each tier of government should be allocated for preparedness and capacity building, which should be given priority in their planning process. Resource mobilisation should be done in a coordinated manner with the concerned stakeholders for effective implementation of DRM policies and plans [20,41]. The federal and provincial level governments should focus on institutionalising the DRM structure and system at the local level [19].

6. Conclusions

The review found that the DRRM Act and policies were of utmost required and felt the need for DRRM in Nepal. The Natural Calamity Relief Act 1982 has been replaced by the Disaster Risk Reduction and Management Act 2017, which is a major shift in the regulatory framework on DRRM in Nepal. Later, the DRRM Act and legislation elaborated on developing the National Policy for Disaster Risk Reduction and Management 2018. A higher level of commitment was found in formulating the laws and policies; however, a low level of commitment was found in developing the capacity building of local government. There are defined roles and responsibilities of different levels of government; however, their accountability mechanism are poor. The review shows that there are several policies, acts, and legal instruments in DRRM in Nepal; however, their implementation status was observed to be weak. This indicated that the legal framework remains a principle on paper if not implemented at the ground level. There are clearly defined institutional structures and systems at all tiers of government, but they require a capacity development plan to implement DRRM plans and policies. Vulnerable communities should have the opportunity to participate in developing plans and policies. Hence, the article reviewed the DRRM regulatory provisions and systems and suggested ways for improvement for effective implementation. The review found extant literature on Nepal's context in policy on DRRM in general, but found limited literature on empirical research and implementation status at the ground level.

Author Contributions

Conceptualization, G.B.R., K.T. and S.G.; methodology, G.B.R. and K.T.; validation, K.T., W.K., N.R. and S.G.; formal analysis, G.B.R.; investigation, G.B.R.; resources, G.B.R.; writing—original draft preparation, G.B.R.; writing—review and editing, G.B.R. and N.R.; supervision, K.T. and W.K.; project administration, G.B.R. All authors have read and agreed to the published version of the manuscript.

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Not applicable.

Data Availability Statement

Since this study conducted using the systematic review approach, no further data stored or archived.

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Conflicts of Interest

The authors declare no conflict of interest.

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