

Regional Policy for Disaster Risk Management in Developing Countries Within the Sendai Framework: A Systematic Review

Surianto Surianto^{1*}, Syahirul Alim², Ricvan Dana Nindrea¹, Laksono Trisnantoro³

¹Doctoral Program, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta City, Indonesia;
²Department of Nursing Sains, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta City, Indonesia; ³Department of Health Policy Management, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta City, Indonesia

Abstract

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***Correspondence:** Surianto Surianto, Doctoral Program, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta City, Indonesia. E-mail: iraanto2013@gmail.com

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The recently concluded World Conference on Disaster Risk Reduction (WCDRR) in Sendai, Japan and the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) have set renewed priorities for disaster risk reduction (DRR) for the next 15 years. This framework is the main guiding instrument for Disaster Risk Management (DRM) within the scope of sustainable development and the eradication of poverty. Disaster management policies and practices should be based on an understanding of risks, not just on an ideological level. Gap and key challenges identified include Still weak coordination, cooperation and linkages among the sectors related to DRR, Lacks of skills in loss assessment and post disaster needs, lack of strategic research agenda, absence of consensus regarding terminology, and limited coordination between stakeholders. The aim of this study was to gain an understanding of why disaster risk reduction efforts undertaken by regional policy often fail to improve future disaster responses. These findings can be used to help guide to improve regional policy in disaster risk reduction processes. This research is a systematic review study by collecting articles that are relevant to *International Journal of Disaster Risk Science*. From the analysis, we found that all four priorities for action in the Sendai Framework are relevant to Disaster Risk Management (DRM) field as follows: 1). Understanding disaster risk; 2). Strengthening disaster risk governance to manage disaster risk; 3). Investing in disaster risk reduction for resilience and 4). Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

Introduction

The Sendai Framework used for disaster risk reduction which goal started from 2015 until 2030 notes that over 700 thousand people have lost their lives, 1.4 million have been injured, and approximately 23 million have been made homeless. Overall, more than 1.5 billion people have been affected by disasters. The total economic loss was more than USD 1.3 billion. Also, between 2008 and 2012, 144 million people were displaced by disasters [1]. In the last decade, Asia has experienced 1730 natural disasters, which is 39 % of all-natural disasters in the world and almost 50 % of the total disaster losses and also the impact in an economic estimated loss of

approximately USD 752 billion [2].

The impacts of disaster can disrupt the progress and developmental efforts of nations, often pushing them many years back [3]. That a major cause of these natural disasters is the changing climate, which affects human lives while exceeding the economic toll [4]. In support of this argument, stated that “the techniques to efficiently discover, collect, organize, search, and disseminate real-time disaster information have become national priorities for efficient crisis management and disaster recovery tasks” [5]. Although it may not be possible to entirely prevent all disasters, it is well acknowledged that an effective use of innovative technology can, to a great extent, reduce the magnitude of loss in life and property. Indeed, emerging technological innovations

including social media, location-based systems, radio frequency identification, and big data analytics (BDA) are considered as powerful tools that may help stakeholders during the disaster management cycle [6].

The research results revealed significant progress in integrating climate change adaptation into the policy and regulatory frameworks of the three relatively new fields of (a) disaster risk reduction, (b) environmental management and (c) urban planning. It is concluded that to achieve greater and more coherent integration of climate change adaptation (CCA) and, improve the way climate-related risks are dealt with, urban authorities need to systematically review current policies and regulations to assess the synergies and gaps [7].

Disaster management has been defined as the body of policy and administrative decisions, the operational activities, the actors and technologies that pertain to the various stages of a disaster at all levels. The literature about disaster management is becoming wide. Even a cursory review of the literature would identify that scholars of disaster management claim different theoretical foundations and argue different theoretical frameworks. It is necessary to conduct a systematic review to find out the literature on disaster management and to know the latest issues. Review with systematic review will give the decision to strong literature because based on searching the source of information from trusted articles.

Taking into account the experience gained through the implementation of the Hyogo Framework for Action, and in pursuance of the expected outcome and goal, there is a need for focused action within and across sectors by States at local, national, regional and global levels which is better known as this thing following four priority areas: Priority 1 (understanding disaster risk); Priority 2 (strengthening disaster risk governance to manage disaster risk); Priority 3 (investing in disaster risk reduction for resilience) and Priority 4 (enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction) [1].

This study aimed to gain an understanding of why disaster risk reduction efforts were undertaken by regional policy often fail to improve future disaster responses. These findings can be used to help guide to improve regional policy in disaster risk reduction processes.

This paper is structured as follows: the next section describes the methodological approach used to conduct the review. This is followed by an analysis of the data collected, and then by a discussion of the results obtained and an outline of suggestions for future research on regional policy disaster risk reduction. The final section reports the conclusions.

Methods

This research is a systematic review study by collecting articles that are relevant to the International Journal of Disaster Risk Science. This research was conducted by reviewing articles from 2012 to December 2017. Impact factor (IF) is one measure that shows the average citations to articles published by a scientific journal within a certain period (for example: IF within 2 years, or IF within 5 years). IF is often a benchmark for researchers to select target journals by considering the possibility of citation of the article. The higher the IF, the greater the chance for citations to a published article in the target journal. This results in a comprehensive set of articles on selected topics. However, it is possible to skip some papers inadvertently. For the literature review, we have used the four-stage protocol (Figure 1): a) search done in the title and abstract field of database Scopus, Proquest, Pubmed with keyword: policy AND disaster risk management AND disaster risk reduction. Data analysis using guidelines from the preferred reporting item from the Systematic Reviews and Meta-Analysis (PRISMA); b) the selected article is then filtered, irrelevant title of study excluded; c) further review of the full-text articles assessed for eligibility and d) full-text articles are taken and reviewed individually by all authors for additional filtering. Remaining records are abstracted for analysis.

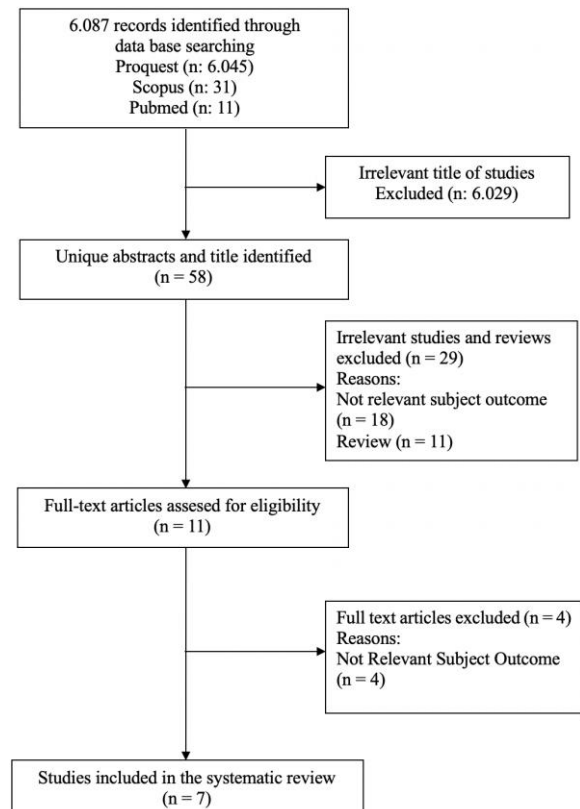


Figure 1: Prisma Flow Diagram

Results

In this section, we use methods to classify selected articles by author, year, title, research methodology, and the results of research (Table 1):

Table 1: Article Result of Systematic Review

No	Authors, year	Method	Outcome
1	Moshodi T, 2016 [8]	A qualitative research design, Study of the phenomenon	In particular, the study showed that in key disaster management activities and Processes, such involvement in institutional bodies for risk management, disaster risk assessment, training and awareness is very limited, or no stakeholder management is currently taking place. This lack of participation and inputs from sinkhole affected communities in the Merafong Local Municipality (MLM) understanding of the extent of the problem and which communities are deemed priority areas for risk reduction interventions
2	Ahmedab Z, 2013 [9]	Critical review.	This study has found that the Act emphasises mainly on institution building and action plan development for mitigating disasters in the country. Strategies have been developed to integrate Disaster Risk Reduction (DRR) in development policies and practices. However, due to bad governance, lack of political. Commitment, rampant corruption, economic constraints and overambitious plans, these policies and plans have not been implemented effectively. It has also transpired that Disaster Risk Management (DRM) policies have been implemented in an ad hoc and uncoordinated manner.
3	Baytiyeh H, 2017 [10]	Literature review.	This research demonstrates that Socio-cultural characteristics can profoundly influence the success or failure of the implementation of disaster risk reduction (DRR) strategies in divided sectarian societies. Despite recent progress in response management and disaster awareness, the lack of policies intended to institutionalise DRR and the neglect of integrating socio-cultural characteristics into DRR strategies. However, due to the lack of policies institutionalising DRR, such actions have remained inadequate, short-lived, fragmented, localised efforts ineffective at reducing the impacts of future large-scale disasters, such as earthquakes.
4	Niekerk D V, 2015 [11]	Qualitative and Quantitative Design	The research found that African countries have been making steady progress in implementing disaster risk governance against theoretical indicators. It is evident from the research that significant national political commitment to disaster risk reduction exists in most countries. Certain gaps and challenges are, however, still hampering better progress in the reduction of disaster risks. For disaster risk reduction to become a reality, national political support is needed (which mostly drives a legislative reform process). National commitment and involvement by African governments in international (global, regional and sub-regional) disaster risk reduction processes should be sought, with an emphasis on cross-border disaster risk reduction through appropriate protocols.
5	Alcayna T, 2016 [12]	A descriptive study on direct observations of and conversations	Results: Numerous activities in community-based resilience and Disaster Risk Reduction (DRR) have been identified across the whole disaster continuum. Important gaps in research and practice remain. Discussion results: The Philippines is a leading regional actor in disaster risk management. However, a full picture of who is doing what, how, where, and when on resilience and disaster preparedness does not exist.
6	Pal I, 2017 [13]	The research descriptive study evaluation	The study principally examines the effectiveness of the Indian policy about the disaster management in achieving its intended outcome, i.e. Achieving effective mitigation and response to a disaster thereby minimising the casualties and losses to the community caused by the cyclone Phailin, India in 2013. Policies and legislation related to risk management are paramount towards defining the efficiency of the on-ground implementation of the Disaster Management Plan.
7	Sihvola KP and Chimpuku SV, 2016 [14]	Semi-structured interviews and document review.	Governance challenges and the historical burden have resulted in overlapping policy processes, as both policies incorporate the other field, and creates a threat of parallel national-level structures, thereby increasing potential inefficiencies in governance and policy implementation. The importance of developing a horizontal integration implementation of the DRR and Climate Change Adaptation (CCA) policies strategy before policy formulation processes to avoid the potential of inefficiencies became evident.

Discussion

From the analysis, we found that there are only a few studies based on theory. Disaster risk management policies and practices should be based

on an understanding of disaster risk across all dimensions of vulnerability, capacity, people and exposed assets, hazard and environmental characteristics. Such knowledge can be utilised for risk assessment before the disaster, for prevention and mitigation and the development and implementation of adequate preparedness and effective response to disasters. The following describes the challenges and opportunities of disaster risk reduction policy research with theoretical insights by Sendai Framework.

Understanding disaster risk

Correct understanding of the risk-based on science, technology and local wisdom. Including the availability of detailed multi-threat assessment of risk for all areas, all spatial planning has used risk assessment.

In their approach to disaster risk reduction, States, regional and international organisations and other relevant stakeholders should take into consideration the key activities listed under each of these four priorities and should implement them, as appropriate, taking into consideration respective capacities and capabilities, in line with national laws and regulations. In the context of increasing global interdependence, concerted international cooperation, an enabling international environment and means of implementation are needed to stimulate and contribute to developing the knowledge, capacities and motivation for disaster risk reduction at all levels, in particular for developing countries [1].

To date, disaster management has been limited to preparedness and response, with little understanding of the need for risk reduction and post-disaster recovery. However, the introduction of the 2005 Hyogo Framework for Action (HFA) 2005-2015 results in a global paradigm Shifting from limited emergency measures to a more comprehensive approach to disaster management [15]. Sendai Disaster Risk Reduction Framework (SFDRR) 2015-2030, which replaces the HFA 2005-2015, reinforces the need for a broad approach to DRM. SFDRR emphasises the need to strengthen disaster risk reduction (DRR) and the establishment of a national health system strengthening as a means of achieving DRR [1].

Drawing from experience in disaster response and consistent with HFA principles, the World Health Organization (WHO) realises the importance of an all-peril and overall healthy approach to the health sector of Disaster management. WHO articulates its core commitment to health disaster risk management (DRM) at World Health Assembly Resolution 64.10 [16] and 65.20 [17].

Meanwhile, to strengthen DRR efforts within the Regional / Cross-border, Indonesia plays an active role through the *Association of Southeast Asian*

Nations (ASEAN) and is committed to managing DRR together. One example is through Indonesia's commitment as one of three early warning providers within the Indian Ocean Tsunami Warning System (IOTWS). Also, the AHA Center, based in Jakarta and fully facilitated by the Government of Indonesia. Furthermore, Indonesia also has laws and policies on disaster management that have incorporated many aspects emphasised by the ASEAN Agreement on Disaster Emergency Response (AADMER) and actively participates in the *ASEAN Committee on Disaster Management* (ACDM), *Indian Ocean Rim Association* (IORA) forums.

The previous study known 58% of countries assessed has established a disaster risk management coordination unit (DRM) in their Ministry of Health (MOH). Most have dedicated DRM Health Department staff (88%) and national level DRM committees (71%). Only Fourteen (58%) countries have health DRM sub-commissions that use multi-sector disaster risk reduction platforms. Less than 40% have conducted surveys such as disaster risk analysis, hospital safety index, and health mapping of resource availability. The main challenges in implementing the strategy are political will, and inadequate commitment generates poor funding for DRM health, weak health systems, and lack of scientific evidence on DRM mainstreaming and disaster risk reduction in long-term health system development programs [18].

The effectiveness of the Indian policy about the disaster management in achieving its intended outcome it's achieving effective mitigation and response to a disaster thereby minimising the casualties and losses to the community caused by the cyclone Phailin, India in 2013 [19]. Policies and legislation related to risk management are paramount towards defining the efficiency of the on-ground implementation of the Disaster Management Plan.

Strengthening disaster risk governance to manage disaster risk

National, regional and global disaster risk governance is essential for effective and efficient management of disaster risk. Clear vision, plans, competencies, guidance and coordination across sectors and the participation of relevant stakeholders are required. Strengthening disaster risk governance for prevention, mitigation, preparedness, response, recovery and rehabilitation is necessary to encourage collaborative mechanisms and partnerships across agencies and for the use of instruments relevant to disaster risk reduction and sustainable development [1].

To achieve this, it is important: To mainstream and integrate disaster risk reduction within and across all sectors and review and promote the coherence and further development, as appropriate, of national and local frameworks of laws, regulations and public

policies, which, by defining roles and responsibilities, guide the public and private sectors in: (i) addressing disaster risk in publically owned, managed or regulated services and infrastructures; (ii) promoting and providing incentives, as relevant, for actions by persons, households, communities and businesses; (iii) enhancing relevant mechanisms and initiatives for disaster risk transparency, which may include financial incentives, public awareness-raising and training initiatives, reporting requirements and legal and administrative measures and (iv) putting in place coordination and organizational structures. To adopt and implement national and local disaster risk reduction strategies and plans, across different timescales, with targets, indicators and time frames, aimed at preventing the creation of risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience; To carry out an assessment of the technical, financial and administrative disaster risk management capacity to deal with the identified risks at the local and national levels [1].

Governance challenges and the historical burden have resulted in overlapping policy processes, as both policies incorporate the other field, and creates a threat of parallel national-level structures, thereby increasing potential inefficiencies in governance and policy implementation. The importance of developing a horizontal integration implementation of the Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) policies strategy before policy formulation processes to avoid the potential of inefficiencies became evident [14].

I am improving the governance system in disaster management through the application of principles of participation, justice and equity, professionalism, independence, efficiency in resource use and targeted/effective. Including LGs can manage risks: DRR policies, professional human resources, adequate budgets, multi-threat risk assessments and integrated planning, Secure culture has been built on individual residents living in disaster-prone areas, and Risk assessment through districts is comprehensive and updated regularly.

In Asia, local governments provide services to their communities and act as implementing agents for most DRR work. All levels of local authority in Asia have various capacities. In general, local authors play an important role in regional development planning, promoting comprehensive school safety, encouraging disaster-resistant towns and villages through community-based DRB at the local level, and promoting the development of community-based support networks [20].

Since 2007, the Indonesian government has developed a strong framework for strengthening disaster risk management in the country by issuing several laws, regulations, plans and policies. In the field of data collection, analysis, management and use

of disaggregated data on disaster areas, Indonesia has launched an online system called DIBI in 2008. The presence of DIBI provides an opportunity to identify trends, risks and vulnerabilities in the future come.

Through this process, local/municipal governance in DRR activities is strengthened, and stakeholder roles and responsibilities are identified, classified, and ultimately done. The most important set of actors are government and local institutions. Local governments are fully responsible for the safety of their citizens and communities. Help is far from enough to play beyond just a complementary role in overcoming risk management challenges [21].

The local level is very important, not only because it is more discerning to the citizens but because it is the basic environmental management warehouse and regulatory function that is essential for effective DRR [22]. Many commentators pointed out that the most important change in this framework is its emphasis on disaster risk management and no longer Disaster Management.

Other research results indicate that African countries have made steady progress applying disaster risk governance to theoretical indicators. This continent contains some international best practices that can be learned by other countries. Certain gaps and challenges, however, still hamper better progress in disaster risk reduction. There is a need for multi-layered ownership and an understanding of disaster risk and its cross-sectoral nature, with strong community involvement [23].

Investing in disaster risk reduction for resilience

Public and private investment in disaster prevention and disaster reduction through structural and non-structural measures that are essential to enhance economic, social, health and cultural resilience of individuals, communities, countries and their assets, as well as the environment. This is to encourage innovation, growth and job creation. These measures are through effective financing and contribute to the rescue, prevent and reduce losses and ensure effective recovery and rehabilitation. [1].

The majority of the economic losses that have occurred in Asian disasters have recently been borne out by the private sector when compared to the public sector. As Asia has emerged, as a global business centre with an extensive supply chain network, the impact of disasters is no longer limited within national boundaries. More than 70% of the capital investments are made by the private sector globally, and in Asian countries, it is important to secure these investments, which will adversely affect regional, national and local economies in the event of significant losses due to natural disasters. Future increases in the privatisation of basic services and critical infrastructure are often

predictable, which places the responsibility on private sector groups to be actively involved in DRR in Asia [24].

Total investment for DRR activities has increased sharply from Rp 2.6 trillion in 2006 to nearly Rp 10 trillion in 2012, according to a UNDP study; it is believed that DRR investment in Indonesia is larger considering that some activities are attached to sectoral programs. During 2006 to 2011, two-thirds of the investment for DRR was allocated for mitigation and disaster prevention activities, followed by preparedness and research activities, education, and training.

The resulting study has found that the Act emphasises mainly on institution building and action plan development for mitigating disasters in the country. The Act does not directly mention disaster risk reduction, and there are no directions about the budgetary mechanisms and extent of funds from disaster risk management (DRM) in the country. The DRM in Pakistan is reactive, and there is a need for revision of PDMA 2010 to make it proactive [9].

In line with its commitment to SFDRR, Indonesia recognises the need to develop its commitment to DRR more thoroughly and sustainably, based on success, lessons learned from past targets, and challenges in the past. Projection is used in planning based on an analysis of the patterns that are formed in the present and the past as well as considering the uncertainty/scenario phenomenon that can occur. According to the [25], a good understanding of the decision-making context is crucial in determining the types, resolutions, and characteristics of information required for vulnerability assessment, adaptation, and the impact of natural disasters. [26] Emphasize that the choices that make up the planning process consist of three levels: a) the objectives and criteria available; b) identification of options that conform to the desired constraints and options and c) implementation guidance on the options taken.

One of the challenges in applying the concept of disaster risk reduction and climate change is how to determine the right formulation in translating a concept into an operational State Policy. The future environmental conditions will be much different from the present and "uncertainty" or the uncertainty of the scale of change that will occur to confirm that no one type of planning approach can answer the whole problem. The encourage to use flexibility of planning approaches that can be modified quickly if the situation suddenly changes. Integration of program/activity planning does not necessarily solve the problem [27]. The major environmental planning challenge lies in the scale of natural resource management and the scale of implementation of international activities and cooperation in promoting the adaptive capacity to achieve sustainable development objectives [28]. The capacity for each

stakeholder engages in relying on the quality of the local policy culture [29].

The results show that the low penetration of government instruments for disaster risk reduction in Mexico has led to high community dependence on post-disaster measures. [30]. The Sendai Strategy for Disaster Risk Reduction 2015-2030 leads us to improve understanding of disaster risks in the various dimensions of vulnerability characteristics, strengthening disaster risk management, and readiness to "rebuild for the better." The main objectives are strengthening disaster risk management to manage disaster risk and investing in disaster risk reduction for toughness [1].

The above policy references, both nationally and globally, provide a strong impetus to focus on disaster risk reduction. However, the implementation of disaster risk reduction programs in disadvantaged areas still faces several internal challenges: 1) lack of regulation and weakness of disaster risk reduction policies such as the lack of compilation of Local Action Plans (RAD), Spatial and Regional Plans (RTRW) based on disaster risk, and other supporting policies; 1) the weakness of the disaster risk reduction planning system; 2) weak institutional capacity and disaster risk reduction activists, 3) lack of access and information related to disaster risk reduction; 4) lack of capacity building activities such as technical guidance, socialization, workshops, training, simulations, and so on; 5) minimization of local government budget allocation in disaster risk reduction investment activities.

Enhancing disaster preparedness for effective response and to "build back better" in recovery, rehabilitation, and reconstruction

Stable disaster risk growth, including increased people and exposed assets, combined with past disaster learning, demonstrates the need to strengthen disaster preparedness and response further, taking action to anticipate events, integrate disaster risk reduction in preparedness and ensure response capacity and effective recovery at all levels. Empowering women and people with disabilities for public leadership and promoting gender equality and access to a generally accepted response, rehabilitation and reconstruction rehabilitation approaches are key. Disaster has shown that the recovery, rehabilitation and reconstruction phase need to be prepared ahead of the disaster, this is an important opportunity to rebuild better, including by integrating disaster risk reduction into development measures, making the nation and community resilient to disaster [1].

The results show that the implementation of HFA by the local government is one of the important areas for the international community to support and

cooperate. Such recognition and efforts are also promoted through international initiatives such as the ISDR World Campaign for the PRC "Making Cities Resilient" (UNISDR 2010), which promotes local governments from around the world to take action in implementing DRR activities [31].

Governments and communities that can respond effectively to disaster and bounce back after the disaster and build a better life. Including Government and community members in areas with high self-reliance capacity, Government and community members in the regions can conduct post-disaster recovery and reconstruct better, and There are effective mechanisms of cooperation in disaster response ranging from community, regional, national to the regional level.

The research demonstrates that, despite recent progress in response management and disaster awareness, the lack of policies intended to institutionalise DRR and the neglect of integrating socio-cultural characteristics into DRR strategies have undermined the effectiveness of Lebanon's disaster response capacities. The author highlights the important role of religio-political organisations in influencing socio-cultural factors and contributing to DRR implementation [10].

Other research results: Numerous activities in community-based resilience and Disaster Risk Reduction (DRR) have been identified across the whole disaster continuum. Important gaps in research and practice remain. Discussion results: The Philippines is a leading regional actor in disaster risk management. However, a full picture of who is doing what, how, where, and when on resilience and disaster preparedness does not exist [12].

Conclusions

Based on a review of the literature on regional policies in resolving issues related to disaster risk reduction, it is important to improve local government capacity as well as to improve community resilience through measures taken by local governments through the four priority actions in the relevant Sendai Framework with disaster risk reduction policy, as follows: 1). Understanding disaster risk; 2). Strengthening disaster risk governance to manage disaster risk; 3) and investing in disaster risk reduction for resilience and 4). Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

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