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Policy Design for Strengthening Disaster Risk Reduction Based on Sendai Framework for Action in West Sumatera Province, Indonesia

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ABSTRACT

This research aims to discuss the design of policies to strengthen disaster risk reduction based on the Sendai Framework for Action. This research is a relatively new study because it formulates a policy design based on the Sendai Framework to improve the quality of disaster risk governance. This research was conducted in West Sumatra Province using evaluative qualitative methods, and the NVIVO 12 Plus application was used to test and analyze data and design research results. The findings of this research indicate that there are problems with institutional regulations, accountability, and human resource capacity in reducing the risk of disasters in West Sumatra Province. Based on the research findings, the results showed that stakeholders declared strengthening the Sendai Framework dimensions acceptable. To enhance the Sendai Framework dimensions, designing and implementing policies and programs to strengthen policies and regulations, community empowerment, increasing human resource capacity, and budgeting related to disaster risk reduction in West Sumatra Province is necessary. This research implies that conceptually and practically, it is a breakthrough in providing policy recommendations to the government to design relevant regulations for disaster risk management needs.

1. INTRODUCTION

The implementation of disaster management policies in Indonesia, especially in West Sumatra Province, has yet to be optimally implemented in terms of strengthening disaster risk management [1-4]. Several problems related to the existing condition of disaster risk management in West Sumatra Province were found: First, there still needs to be overlapping authority, duties, and functions as well as resources owned by each stakeholder in disaster management, which also causes overlapping program implementation. This condition is caused by a large number of disaster management institutions in Indonesia, such as the National Disaster Management Agency/ West Sumatra Disaster Management Agency, Meteorology, Climatology and Geophysics Agency, Volcanology Disaster Mitigation Center, National Search & Rescue Agency, Ministry of Social Affairs / Social Services, National Armed Force, National Police, and several other institutions.

The division of institutional authority, duties, and functions is still on paper, and minimal training, simulation, and routine testing (drill) at various levels/scales. So, the readiness of these institutions is still very doubtful when facing large-scale disaster threats such as earthquakes and tsunamis [3, 4]. Resource allocation is also a fundamental problem because almost all disaster management institutions at the central and regional levels need more resource availability. The resources in question include budget aspects, equipment/supplies, and, most importantly, trained Human Resources. The problem of inequality and lack of resources is found in almost all institutions involved in disaster management [5-9].

Meanwhile, to achieve effective disaster risk management, a public policy is needed that provides a basis for disaster risk reduction efforts [10-14], where the policy must involve all relevant stakeholders to optimize disaster management activities [15-19], the next problem is that various disaster management training that is carried out are still formalities and need to be carried out routinely [20-24]. On the other hand, the human resources who take part in the training are not the ones responsible for disaster management operational plan activities [11, 25-29]. Added to this is the still minimal readiness of early warning system technology, including in the aspect of information management in disaster mitigation and preparedness [30-33].

At the central and regional government levels, the focus of disaster management policies is still dominated by the old paradigm. Namely, disaster management is dominant at the emergency response and response stages. On the other hand,

in the new paradigm, disaster management focuses more on efforts in disaster risk reduction [34-36]. This problem is increasingly complex when viewed from the need for more real action in improving disaster risk management to reduce disaster risk, especially in areas with high levels of vulnerability.

Accountability and good governance are required to ensure the optimal disaster management process. The West Sumatra Province Disaster Management Plan Document explains that good governance for disaster risk reduction programs implemented by the government or non-governmental institutions needs to be improved. It is also described in the document that good governance is better directed at efforts to ensure a straight comparison between the size of the budget and the size of the benefits provided. Obtained. Good governance needs to be a shared commitment where the principles of transparency, accountability, and joint oversight are its core components.

A form of building disaster management governance is to prepare the use of information systems and technology that are easily accessible and used by the public [37-39]. Based on initial observations, the InaRisk android-based application has been implemented. The National Disaster Management Agency developed it; all Regional Disaster Management Agencies can use it. It is also open to the public. The content offered in the application is information about the region's level of vulnerability to various disasters. The application has also been integrated with Google Maps immediately, providing real-time and up-to-date information. The plan for the future is that this application will also provide information about evacuation routes and locations for disaster threats, including tsunamis.

Improving the system's quality in the organization is necessary to enhance organizational governance and make it more optimal. The use of technology in integrated disaster program planning, emergency response management, logistics and assistance management, budget use, and disaster program evaluation has yet to be developed by the West Sumatra Provincial Government. So, based on research findings, integrating disaster management program planning across regional apparatus organizations in West Sumatra Province still needs to improve its implementation, monitoring, and evaluation. This is a crucial point where efforts to synchronize disaster management program planning can be carried out optimally if a system is developed. So far, efforts to monitor and evaluate the program have not been running optimally because there has been no adequate equipment.

The Disaster Management Plan of West Sumatra Province explains that a policy planning system with supervision and evaluation of the procedures used needs to be developed. The development is also expected to guarantee the implementation of an evaluation mechanism for the procedures used. The effectiveness of implementing operations can be reviewed by exchanging relevant information, especially during the emergency response period [40].

Some of the challenges faced in efforts to reduce disaster risk in West Sumatra are as follows:

1. More intense efforts need to be made to increase institutional capacity, which is developed and evaluated periodically, especially in disaster risk reduction policies.

2. The disaster management planning in West Sumatra Province has yet to be followed up in program planning for each regional apparatus organization. Several regional apparatus organizations have different perceptions, such as the responsibility for disaster management being only on West Sumatra Disaster Management Agency as the leading sector. So that the vision, mission, program, and priority of disaster management actions are not used in designing cross-regional apparatus organization programs.

3. West Sumatra Disaster Management Agency, as the initiator of this activity, has been implementing the disaster risk reduction program alone.

4. Other sectors, such as preparing infrastructure for critical facilities against the risk of disasters, have yet to be optimally planned in related regional apparatus organizations such as the Public Works Agency, the Settlement Agency, and others. The Central Government mainly provides critical facilities through the Special Allocation Fund scheme in locations vulnerable to disasters in West Sumatra Province.

5. Due to budget constraints, the availability of essential facilities such as temporary evacuation sites still need to be improved when compared to the prediction of densely populated areas affected by a disaster if it occurs.

6. The fostering and capacity building of the Community Alert Group in each sub-district runs sporadically, depending on the availability of funding and programs from the West Sumatra Disaster Management Agency. Research findings show that, on the other hand, the involvement of NGOs in assisting Community Alert Groups at the regency or city level is quite good. The mentoring program carried out is still focused on the regency or city areas with the highest vulnerability and on a scale of community involvement that is still limited.

7. The disaster-resilient program that has been implemented has yet to achieve optimal results. Minimal budget support and limited human resource capacity building are still the main problems preventing the achievement of this program's objectives.

8. The lack of synchronization of disaster management programs so far is due to the abnormal process of internalizing disaster management in development planning. This problem occurs because the regional paradigm is still sporadic and unplanned, so good disaster risk management must still be achieved.

9. The training has yet to be conducted for other stakeholders, such as related regional apparatus organizations involved in disaster emergency response operations. In addition, the sustainability of this capacity-building program is also in doubt due to the limited budget of the West Sumatra Disaster Management Agency.

10. Transfers made to human resources who had received training to serve outside the West Sumatra Disaster Management Agency were also obstacles to achieving disaster risk reduction objectives.

11. The plan to strengthen governance disaster risk as mandated in the Sendai Framework for Action has yet to be achieved optimally.

Based on the problems above, this study aims at three aspects, namely:

1. Analyzing the policy of strengthening disaster risk reduction based on dimensions, descriptors, and sub-descriptors in the Sendai Framework in West Sumatra Province.

2. Designing a policy for strengthening disaster risk reduction based on the Sendai Framework in West Sumatra Province.

3. Testing the policy design for strengthening disaster risk reduction based on the Sendai Framework in West Sumatra Province.

2. LITERATURE STUDY

As delineated by the Sendai Framework, the chapter underscores the imperative for a holistic comprehension of disaster risk that amalgamates exposure and resilience. It advocates for the utilization of the abstraction hierarchy to scrutinize socio-technical interactions within urban systems. Such analysis can facilitate policy formulation by elucidating essential elements that may precipitate cascading ramifications during hazardous events [41]. This investigation fortifies the theoretical framework, particularly through the incorporation of both social and technical dimensions within disaster risk reduction policies.

Robust policy formulation aimed at enhancing disaster risk reduction should prioritize decisions grounded in empirical evidence, as articulated by the Sendai Framework for Disaster Risk Reduction. By confronting these reductionist assertions, policies can achieve greater congruence with the intricate realities of disaster risks, ultimately culminating in more efficacious risk mitigation strategies [10]. This manuscript contributes conceptually by asserting the significance of evidence-based decision-making in the realm of disaster risk reduction initiatives.

The research accentuates the necessity for a comprehensive National Disaster Risk Reduction Strategy in Bangladesh that harmonizes with the Sendai Framework for Disaster Risk Reduction. It discerns deficiencies in national DRR policies and proposes enhancements through a critical evaluation of these policies in relation to SFDRR directives [42]. This document establishes a foundation for the advocacy of national-level disaster risk reduction policies and strategies that are congruent with the national action Framework.

Effective policy formulation for bolstering disaster risk reduction should incorporate the Sendai Framework for Action by highlighting proactive risk management, interlinking disaster strategies with developmental agendas, and ensuring sufficient ex-ante fiscal allocation for mitigation initiatives [43]. This research emphasizes that in order to reinforce disaster risk reduction policies, it is imperative to consistently integrate the Sendai Framework as an intrinsic component of risk management.

The Sendai Framework for Disaster Risk Reduction underscores the necessity for cohesive policies that augment resilience while mitigating disaster susceptibility. The formulation of effective policies should harmonize local, national, and international initiatives, integrate stakeholder participation, and navigate socio-political intricacies [44]. The findings of this study furnish a conceptual framework that advocates for the integration of disaster risk reduction policies at various levels, thereby mainstreaming the engagement of all relevant stakeholders.

The design of effective policies aimed at fortifying disaster risk reduction should concentrate on systematic endeavors to scrutinize and manage the underlying factors precipitating disasters, as delineated in the Sendai Framework for Action [45]. This manuscript establishes a foundation for the formulation of efficacious disaster reduction policies that emphasize the substance articulated in the Sendai Framework.

Moreover, policies must advocate for decentralization, fortify institutional capacities, and promote collaboration among stakeholders, inclusive of civil society and the private sector. The prioritization of risk-informed strategies and the allocation of sufficient funding are imperative for the successful execution of initiatives and the enhancement of resilience against disasters [46]. This research supports the proposition that robust disaster risk reduction policies are predicated upon collaboration among stakeholders and the fortification of institutional frameworks.

Effective policy design should assimilate these Frameworks to bolster resilience, particularly for at-risk populations in Indonesia. This necessitates the development of synchronized planning instruments that tackle poverty while alleviating disaster repercussions, ensuring that policies are both comprehensive and pragmatic to secure sustainable outcomes in the realm of disaster risk management [47]. The conceptual Framework for a comprehensive and synchronized disaster risk reduction policy represents the principal contribution of this research.

The design of effective policies aimed at reinforcing disaster risk reduction under the auspices of the Sendai Framework should prioritize the attenuation of underlying risk factors concomitant with poverty and the advancement of sustainable development. This encompasses the enhancement of the economic feasibility of risk reduction initiatives, the institutionalization of community-based disaster risk reduction programs, and the integration of risk reduction strategies within recovery frameworks [48]. By directing attention toward the reduction of fundamental factors within the action Framework, the focus shifts toward the fortification of disaster risk reduction policies.

The utilization of empirical data derived from case studies serves to illuminate optimal practices while simultaneously cultivating significant social capital and enhancing local governance networks, thereby augmenting resilience. It is imperative to confront historical inequities and advocate for climate justice as a fundamental component in the formulation of inclusive and efficacious disaster risk reduction policies [49]. This investigation establishes a conceptual framework that underscores the necessity of implementing disaster risk reduction policies in a manner that is both inclusive and effective, premised on the foundation of social capital.

The research underscores the critical importance of a meticulously managed disaster risk reduction (DRR) initiative in Balaoan, which is congruent with the Sendai Framework for Action by emphasizing the principles of prevention, preparedness, response, recovery, and rehabilitation. Such strategies are designed to bolster community resilience and guarantee adequate disaster management, thereby fostering a holistic approach to risk reduction that is consistent with the tenets delineated in the Sendai Framework [50]. Disaster risk reduction policies that align with the Sendai Framework for Action constitute the fundamental basis for sustaining a focus on comprehensive disaster mitigation initiatives.

Strategic design of policies aimed at enhancing disaster risk reduction in accordance with the Sendai Framework for Action should prioritize multi-hazard preparedness, the integration of disaster education into educational curricula, and the enhancement of capacity building among communities and stakeholders [51]. This research substantiates the assertion that cohesive and integrated efforts are imperative in disaster risk reduction to ensure the effective attainment of policy objectives. Policy formulation must be guided by empirical research that identifies the causative factors influencing

disaster risks, thereby ensuring that strategies are both adaptable and tailored to specific contexts. Furthermore, the promotion of inter-sectoral collaboration can significantly enhance resilience and foster sustainable practices, ultimately culminating in more effective disaster risk management outcomes [52]. Within the domain of disaster risk reduction policies, cross-sector collaboration emerges as a principal contribution of this research.

The manuscript delineates a significant discrepancy in the implementation between the policy realms of disaster risk reduction and climate change adaptation at both national and international echelons, underscoring the imperative for enhanced coherence and collaboration amongst these strategies to effectively mitigate the underlying causes of risk within Uganda and Malawi [53]. This manuscript endeavors to furnish a conceptual foundation asserting that disaster risk reduction policies necessitate sustained multi-stakeholder collaboration.

The formulation of effective policy should encompass thorough risk assessments, advocate for community engagement, and guarantee inter-sectoral collaboration. Furthermore, the utilization of data-driven insights and the cultivation of partnerships can bolster resilience and preparedness, ultimately facilitating the execution of the Sendai Framework and associate global initiatives [54]. The synergy of collaboration and data-informed policies, alongside partnerships, constitutes the cornerstone of disaster risk reduction endeavors, which represents the contribution of this inquiry.

In contrast to the antecedent research previously discussed, this investigation is relatively novel as it articulates a policy design grounded in the Sendai Framework aimed at enhancing the caliber of disaster risk governance. This inquiry signifies a conceptual and practical advancement in proffering policy recommendations to governmental entities for the formulation of pertinent regulations addressing the exigencies of disaster risk management.

3. METHODS

Before engaging in a discourse surrounding the definition of policy research, it is imperative to first comprehend the concept of policy itself. The interpretation of policy pertinent to this discourse encompasses a set of provisions that embody principles designed to steer planned and consistent actions aimed at the attainment of specific objectives. From the aforementioned characterization, it can be inferred that the policy under consideration in the context of policy research pertains to actions devised to address social challenges. In this context, the solutions proposed by policymakers for social issues are fundamentally grounded in the recommendations proffered by policy researchers, which are derived from their empirical findings. The notion of policy here is not examined through the lens of governmental politics but is instead conceptualized as an object of scholarly inquiry. In the present study, the researchers employed various data collection methodologies, including library research, field research, and focus group discussions, which are delineated as the gathering of data from a select group of formal and transient participants engaged in a thematic discussion. This research was executed within the confines of West Sumatra Province, targeting a diverse array of agencies, institutions, and communities that act as stakeholders in disaster management initiatives, encompassing both vertical government entities and regional bodies, as well as civil society organizations such as Non-Governmental Organizations (NGOs).

To procure primary data for this investigation, the researchers identified individuals or informants deemed knowledgeable and trustworthy, suitable to serve as key informants relevant to the research topic. This selection process is predicated on the assumption that the chosen informants possess the requisite responsibility and authority to actively implement disaster management policies within West Sumatra Province. The subsequent Table 1 presents a compendium of informants associated with this research.

Table 1. List of research informants

Institution	Identity of Informants/FGD Participants
National Disaster Management Agency	Experts of BNPB RI Deputy of National Disaster Management Agency Head of Non-Structural Mitigation of National Disaster Management Agency
West Sumatra Disaster Management Agency	Head of West Sumatra Disaster Management Agency Head of Preparedness Section of West Sumatra Disaster Management Agency Staff of West Sumatra Disaster Management Agency
National Search & Rescue Agency	Head of Search and Rescue Resources Section, Padang Search and Rescue Office
Legal Bureau	Legal Bureau Staff
Organization Bureau	Head of Public Service Sub-Division, Organization Bureau
Research and Development Agency of West Sumatra Provincial Government	Researcher at Research and Development Agency
West Sumatra Environment Management Agency	Staff of West Sumatra Environment Management Agency
West Sumatra Communication and Information Agency	Staff of Communication and Information Service
BMKG	Head of Data and Information, Padang Panjang Geophysical Station, Meteorology Climatology and Geophysics Agency
NGO KOGAMI	Executive Director, Senior Instructor
Disaster Risk Reduction Forum	Chairman of Disaster Risk Reduction Forum of West Sumatra
Mercy Corps	Branch Manager of Mercy Padang Mercy Padang Instructor

The methodology employed in this investigation was Computer Assisted Qualitative Data Analysis Software (CAQDAS), specifically NVIVO 12 Plus, to facilitate the coding procedure. The coding procedure is characterized by its interactive nature, wherein researchers develop data categorizations grounded in the concepts that emerge from the data, juxtapose these concepts with data categories, and subsequently integrate all interrelated concepts and data

categories [55]. As delineated in prior research [56], the coding system serves as a mechanism to annotate specific facets of the data and to categorize information into distinct classifications. Concurrently, the validation of data in this research employs qualitative data analysis, specifically data derived from diverse sources, utilizing a variety of data collection techniques (triangulation). Additional validation of data in this study was accomplished through the execution of comprehensive interviews and Focus Group Discussions (FGDs) with research informants, as well as the triangulation of the outcomes of coding from interview transcripts utilizing the NVIVO 12 Plus application. The coding outcomes in the form of nodes were compared against observational data and pertinent document reviews. The findings from the analysis based on triangulation are subsequently articulated in the results and discussion chapter.

4. RESULTS AND DISCUSSION

4.1 Results

Sendai Framework Dimension based on the results of the analysis of research findings is divided into several descriptors whose matrix coding results can be seen in Figure 1.

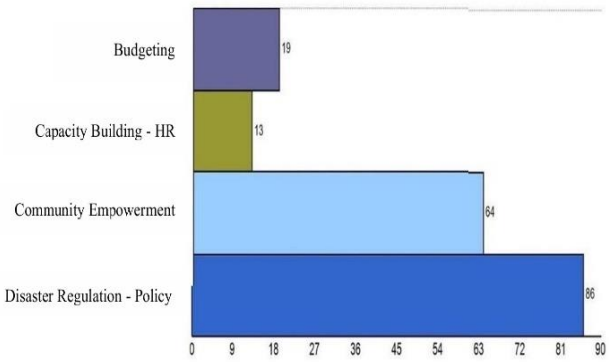

Figure 1. Matrix coding results for Sendai Framework dimension

4.1.1 Disaster regulation and policy descriptors

In this dimension, the first descriptor is disaster regulations and policies, With matrix coding results of 86 points. Conceptually, disaster regulation and policy are keys to strengthening disaster risk governance in West Sumatra Province. The researcher [54] conveys that disaster management policies and regulations support achieving better disaster risk governance; moreover, the disaster regulations and policies rolled out already contain a paradigm shift in disaster management that focuses more on risk reduction.

Several disaster management regulations were produced in West Sumatra Province after implementing Law No. 24 of 2007 concerning Disaster Management. However, in practice, implementing derivative regulations from the law has not been optimal when viewed from disaster risk reduction. Between the hope of a paradigm shift toward existing rules and policies toward disaster risk reduction. However, at the institutional implementation level, the paradigm must be more reactive to disaster events, not preventive and anticipatory.

With various disasters that hit West Sumatra Province, it can be seen that the actions taken are more of an emergency response nature. Meanwhile, although each stakeholder has implemented several programs, disaster risk reduction actions such as structural and non-structural mitigation and prevention have yet to be optimally carried out. The problem of program sustainability is also a problem, seen from the pattern of implementation and release in various disaster risk reduction programs without any control mechanism from the authorities. One example is the Disaster Preparedness School Program, Disaster Resilient Community, Disaster Smart School, Community-Based Disaster Preparedness, Village Disaster Preparedness Group, Disaster Resilient Village, etc. Domestic and foreign NGOs carry out these programs, and the Central and Regional Governments also initiate them. The facts found in the field are that the programs that have been implemented are still in doubt about their sustainability due to the lack of attention from related parties. Complaints conveyed by local communities involved in the program are a less than good record in implementing disaster risk reduction policies institutionally.

Based on the results of the matrix coding above, it can be explained that the disaster regulation and policy descriptors are divided into several sub-descriptors, which can be seen in Figure 2.

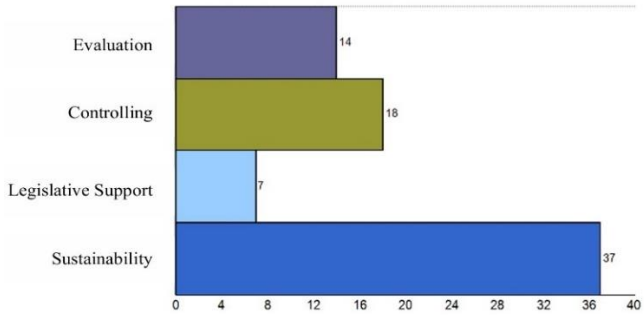

Figure 2. Matrix coding results for disaster regulation and policy

Based on the results of the matrix coding of the descriptors of disaster regulation and policy above, it can be described that several sub-descriptors have levels according to the analysis of research findings. For this reason, each of these sub-descriptors will be explained:

Sustainability Sub Descriptors

The analysis of research findings based on matrix coding shows that sustainability becomes a sub-descriptor at the first level for disaster regulation and policy descriptors. Matrix coding results in 37 points. Several disaster management policies and programs, especially those focused on reducing disaster risk in West Sumatra Province, have yet to consider sustainability in their implementation.

Some examples given are disaster risk reduction programs that are carried out, such as increasing the capacity of community preparedness both in sub-districts and schools, increasing the capacity of disaster management apparatus, building critical facilities such as evacuation locations and routes, and various other policies that still do not consider their sustainability. The “implement and release” action in many disaster risk reduction programs in West Sumatra Province has been a significant problem. The sustainability aspect of various disaster management programs, especially for disaster risk reduction, has not been a priority for follow-up.

The most common reasons are budget constraints, personnel who often change and undergo mutations, lack of support from related agencies, an apathetic and pragmatic society, and

various other issues. So, the success of these programs is very doubtful because of the "implement and release" action due to the lack of support from related institutions to ensure their sustainability. For example, the Community-Based Disaster Preparedness disaster risk reduction program was carried out by the Indonesian Red Cross in collaboration with the French Red Cross as a donor; when the program was implemented, the community showed high enthusiasm. Several informants implementing the activity from the community and Indonesian Red Cross of West Sumatra Province said that the disaster risk reduction program carried out in several sub-districts in West Sumatra Province achieved quite good results in terms of increasing community capacity, developing SOPs and the availability of equipment and supplies for disaster management.

However, the problem that arose was that after the Community-Based Disaster Preparedness program was completed, there needed to be a handover of coaching carried out by the Indonesian Red Cross as the implementer to the West Sumatra Disaster Management Agency as the leading sector in disaster management. As a result, currently, the community that had been trained and had their capacity increased never received additional refreshment and capacity building, and there was also no process of member cadre formation in the Community-Based Disaster Preparedness program.

Sustainability is essential in implementing the program so that the community as the subject gets measurable and comprehensive benefits. Many programs are run with minimal focus, direction, and sustainability. It is not uncommon for organizations to claim to have empowered communities when, in fact, all they do is haphazard, charitable, non-empowering, and nothing more than fulfilling obligations. It was found that many policies and programs for reducing the risk of disasters that were carried out should have paid more attention to sustainability because they only focused on how the program could be accounted for administratively and not substantively. So, to strengthen disaster risk governance, the better, the harder it is to do, and the sustainability descriptors occupying the first level is an important point to be fixed.

Controlling Sub Descriptor

Controlling is a sub-descriptor at the second level of disaster regulation and policy descriptors—matrix coding results of 18 points. The main point that is the basis is the weak control and supervision aspects of disaster management policies, especially disaster risk reduction in West Sumatra Province. Various regulations and disaster risk reduction programs implemented by the government and other stakeholders often fail to ensure that these regulations and programs run well. For example, implementing the disaster-resilient village program based on research findings has not gone well. The weak control mechanism by the policy implementer has caused the program to encounter many obstacles, especially in preparing the resources needed. In addition, there are many differences in perception between the division of program responsibilities, and not infrequently, the relevant stakeholders are indicated to be evasive regarding the problem.

The delegation of authority between each stakeholder is the main problem that makes the control mechanism increasingly more challenging to implement in the disaster risk reduction program in West Sumatra Province. An example is the "who does what" principle in disaster management, which stakeholders have not understood. So, the distribution of authority impacts who is responsible for implementing the control mechanism needs to be clarified. Another example is when an NGO initiates a disaster risk reduction program; it is not uncommon for other stakeholders not to be involved in the program. The West Sumatra Provincial Government, through the West Sumatra Disaster Management Agency, should be responsible for providing support and supervision so that the program is implemented correctly and synergizes with other programs.

Evaluation Sub Descriptor

The matrix coding results of 14 points is an evaluation at the next level according to the results of the analysis of research findings. The existence of this sub-descriptor was found in the study based on the fact that many policies and programs implemented by various stakeholders in reducing the risk of disasters were not evaluated either when the program was running (policy implementation evaluation) or when the program was completed (post-policy implementation evaluation).

The basis of the analysis is that the disaster management policies and regulations that have been ratified, such as laws and regional regulations related to disaster management and their derivative rules, are often not evaluated to determine whether they have been implemented effectively or not. Some examples found in the study are the Disaster Management Plan Document prepared by stakeholders and ratified as the West Sumatra Provincial Regulation, which contains the tasks and functions in disaster management of each institution, which needs to be adequately implemented. Various underlying problems include lack of coordination, not being a priority for budgeting and implementation, and the absence of sanctions for those who do not carry out what has been agreed upon in the West Sumatra Provincial Disaster Management Plan document, including the disaster risk reduction program.

The less successful implementation of disaster management regulations and policies in West Sumatra Province should strengthen the basis for implementing a comprehensive evaluation for future improvements. It requires a strong commitment from each relevant stakeholder to be willing to conduct at least an independent review of the institution's performance in carrying out the mandate and orders of disaster regulations and policies, which have been agreed upon and officially ratified.

Support Sub Descriptor

The problem of insufficient support from the local legislature is the basis for the emergence of research findings and analysis results using matrix coding on disaster regulation and policy descriptors, with matrix coding results of 7 points. Legislative or legislative support is essential in ensuring the implementation of the disaster risk reduction program in West Sumatra Province.

Legislative authority in budgeting and supervising the policies of the West Sumatra Provincial Government is an essential point in the emergence of the problem of lack of support for disaster management programs. The legislative institution has yet to play a role in prioritizing the budget for the disaster risk reduction program in West Sumatra Province. The obstacle that emerged was that many other priority programs, such as education, health, infrastructure, and other fields, were still more important than the disaster risk issues that threatened West Sumatra Province.

This problem arises because an old paradigm still assumes that disaster risk reduction programs must be able to integrate with programs in other aspects. Rationally, the West Sumatra Provincial Disaster Management Plan document mandates that

the development must be based on a study of disaster risks that threaten life and livelihood in West Sumatra Province.

In education, for example, strengthening schools' capacity against disasters can be integrated into the government's education budget without creating a separate program. The division of tasks between the West Sumatra Disaster Management Agency and the Education Office as the budget user will effectively carry out disaster risk reduction actions in West Sumatra Province. Moreover, it is the legislature's task to provide support from the authority it has by existing provisions.

4.1.2 Community empowerment descriptors

Community empowerment descriptors are at the next level of the Sendai Framework based on the results of the matrix coding analysis of research findings reaching 64 points. Community empowerment in reducing the risk of disasters in West Sumatra Province has been running but has faced many challenges. The first challenge is that not all vulnerable communities have received empowerment from relevant stakeholders, especially the government, to increase capacity and preparedness in facing disaster risks. Second, budget limitations make community empowerment programs that reduce disaster risks challenging to carry out periodically and sustainably. Third is the need for more commitment and support from stakeholders, especially the West Sumatra Provincial Government, to implement community empowerment programs to reduce disaster risks.

Local, national, and multinational NGOs have initiated various community empowerment programs. However, due to their lack of intensity and sustainability, these programs have yet to achieve the expected results in building disaster-resilient communities. Often, community empowerment programs have yet to be a priority to budget and implement in a multi-sectoral manner. Almost all community empowerment programs are considered to be the responsibility of the West Sumatra Disaster Management Agency alone, so integration in budgeting and implementation of cross-local agency programs needs to be carried out correctly.

4.1.3 Budgeting descriptors

Based on the analysis of the research findings, the budgeting descriptor is also considered in the matrix coding results of 19 points. The budget issue is one of the main suboptimal aspects of disaster risk reduction in West Sumatra Province. The lack of budget in both the National Budgeting and Local Budgeting has made disaster risk reduction programs not run by the vision of West Sumatra Province to become a disaster-smart city. The disaster management budget has yet to be prioritized at the central or regional levels. Meanwhile, the budget for disaster risk reduction policies and programs receives a tiny portion compared to the budget for emergency response, rehabilitation, and reconstruction. With a minimal budget, stakeholders need help designing and implementing disaster risk reduction programs mandated in policies and regulations at both the central and regional levels.

4.1.4 Capacity building - Human resources descriptors

Capacity building descriptors – human resources are at the next level with a matrix coding result of 13 points based on analysis of research findings. Various training and capacity-building programs have been carried out for the government, NGOs, and the community. However, these programs have not been running sustainably, and there has been no evaluation of their effectiveness in reducing disaster risk. Coupled with the problem that the mutation rate of the apparatus is relatively high, especially for employees in the West Sumatra Provincial Government who are tasked with disaster management, the capacity building program is indicated to have not achieved positive performance. Human resources who have just received training are often transferred to other positions/units/organizations irrelevant to their capacity and expertise.

Meanwhile, capacity building has been carried out for the community, but the program has yet to be evenly distributed and sustainable. The training carried out is more essential and rarely followed up with the next level of training. Moreover, for NGOs themselves, capacity building has been carried out, and human resources mutations in NGOs are seldom carried out. Regarding capacity, human resources in NGOs can be categorized as quite good based on research findings. Meanwhile, capacity building for the private sector, based on research findings, is rarely carried out, even though several building managers have implemented safety briefings as a form of disaster preparedness. However, there still needs to be more improvement in its capacity.

4.2 Discussion

4.2.1 Analysis of policy design to strengthen the Sendai Framework for Action in disaster risk reduction

A policy design was designed based on the Sendai Framework for Action dimensions to strengthen disaster risk management in West Sumatra Province, especially on priority II. For more details, see the following project map in Figure 3.

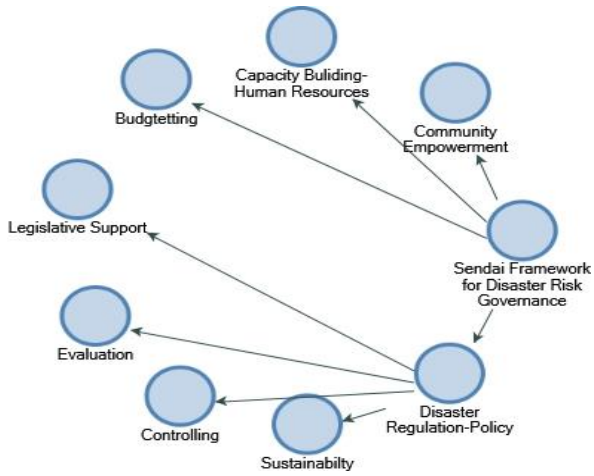

Figure 3. Sendai Framework dimensional reinforcement design

Based on Figure 3, the policy design for strengthening the first dimension of the Sendai Framework is to enhance capacity through the human resource capacity-building descriptor - human resources involved in reducing the risk of disasters in West Sumatra Province. Strengthening human resources capacity can be done with various training programs that are of international standards and adjusted to local conditions. Exercises carried out routinely and continuously will ensure that the readiness of human resources in disaster management can run optimally so that the negative impact of the dangers caused by a disaster can be minimized. Training for building human resource capacity in disaster management that must be routinely carried out and evaluated periodically,

such as Table Top Exercise (TTX), Command Post Exercise (CPX), Field Training Exercise (FTX), Field Rehearsal, Incident Command System (ICS) and Training of Trainers (ToT). The integration of community representative involvement in the training must also be improved to prepare the community to face disaster risks.

The second strengthens the budgeting descriptors for the disaster risk reduction program in West Sumatra Province. With sufficient budgeting, many disaster risk reduction programs can be designed and implemented in West Sumatra Province. The first budget focus is from the National Budget and Local-Regional Budget, which must be prioritized for disaster risk reduction compared to the current dominant aspects of emergency response and post-disaster. The budgeting mechanism can also be implemented through partnerships with the private sector and NGOs by designing regulations as a standard for multi-sectoral involvement.

The next is to strengthen community empowerment or community empowerment in disaster risk reduction. The community in question is vulnerable to disaster risk, and its capacity needs to be increased to empower them and increase their resilience. As one of the subjects of the disaster risk reduction program, the community must be empowered with measurable programs initiated by the central government, local government, NGOs, and the private sector, as well as community self-reliance. For example, the Disaster Resilient for Community program is a derivative of the Disaster Resilient Village Program initiated by the National Disaster Management Agency. Disaster resilience for the community with a smaller reach will ensure that the empowerment program in disaster risk reduction can be right on target and implemented well.

Moreover, the last is to strengthen disaster regulation and policy by establishing a disaster risk reduction program with sustainability-based formulation and implementation, controlling, evaluation, and getting support from the legislative support. A practical example is the capacity-building program of the Disaster Preparedness Group in each sub-district, which needs to be carried out sustainably to achieve optimal results. Furthermore, supervision is required in implementing the program to achieve capacity building and become the spearhead in reducing disaster risk in the community. To ensure that the capacity-building program is implemented, support from the legislature is needed in the form of budgeting, supervision, and evaluation. Meanwhile, other stakeholders, such as NGOs and local communities, can supervise and evaluate the project. For its elaboration, the policy of strengthening the dimensions of the Sendai Framework for Action is explained in Figure 4.

Based on Figure 4, several points can be explained. First, regulations should be designed to contain rewards and punishments, with standards agreed upon by stakeholders. The derivative of this policy is the birth of a disaster risk reduction SOP that is measurable and easy to implement. The existence of a disaster risk reduction SOP will become a guide for all stakeholders. to strengthen disaster regulatory and policy descriptors. Second, regulations should be designed to become standards in determining whether private buildings should be used as Temporary Evacuation Sites (TES) or Final Evacuation Sites (FES). This regulation will guide the government in deciding on private buildings used as TES/FES by security and safety standards against the risk of disasters in West Sumatra Province. Furthermore, designing regulations as a basis for operational standards in disaster early warning. The regulation prepares operational standards for disaster early warning and standardizes equipment for receiving, processing, and disseminating disaster early warning information. Regulating ensures stakeholders must implement disaster management plans that are designed and determined, especially when dealing with the risk of disasters in West Sumatra Province. Implementing integrated preparedness training involving all relevant stakeholders, including the community, is necessary to strengthen human resource capacity. At the same time, this community involvement activity also increases community empowerment in disaster risk management in West Sumatra Province. Then, no less important is how to provide a budget for expanding the capacity of the apparatus, equipment maintenance, and the availability of logistics (food and medicine), including proper storage places according to the study results on the potential risk of a disaster if it occurs. This activity certainly requires strengthening from the budget side for disaster risk management. This budget strengthening requires stakeholders to ensure that there are priorities in preparing the Local-Regional Budget with the local government.

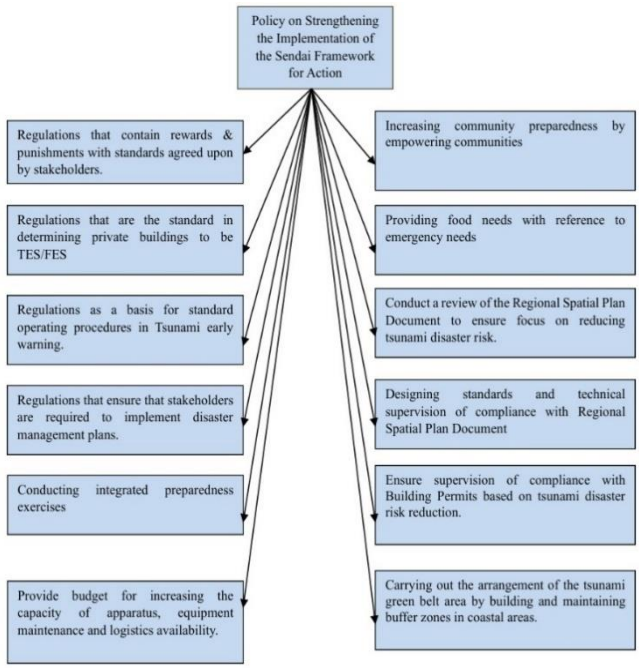

Figure 4. Sendai Framework for Action strengthening policy

Next, the Regional Spatial Plan document should be reviewed to ensure that the focus is on reducing the risk of disasters. This includes designing standards and technical supervision of compliance with the Regional Spatial Plan and Building Permit, designed to minimize disaster risk. It also includes arranging the tsunami green belt area by building and maintaining buffer zones in coastal areas. Moreover, the last goal is to increase community preparedness by empowering people by providing knowledge and skills in disaster risk management.

4.2.2 Analysis of policy design tests to strengthen the Sendai Framework for Action in disaster risk reduction

The researcher coded 13 answers from FGD participants to determine the acceptance of the policy to strengthen the dimensions of the Sendai Framework. From these answers, an analysis was carried out to obtain a picture of the acceptance

of the design of the Sendai Framework strengthening policy in the management of disaster risk in West Sumatra Province. The results can be seen in Figure 5.

In Figure 5, 13 stakeholders who participated in the FGD agreed that the dimensions, descriptors, and sub-descriptors of the Sendai Framework need to be strengthened for disaster risk reduction policies. These dimensions are part of the policy design to improve governance and reduce disaster risk in West Sumatra Province.

With the results of this test, it can be explained that for the design of policies to strengthen disaster risk reduction in West Sumatra Province, comprehensive integration is needed in all dimensions, descriptors, and sub-descriptors in accordance with the Sendai Framework. Collaboration and synergy between all stakeholders are fundamental so that the resulting policy design can improve the quality of the disaster risk reduction policy.

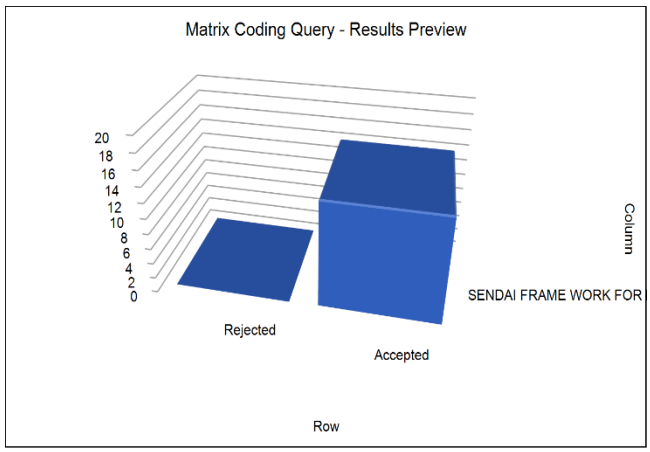

Figure 5. Matrix coding test for dimension of Sendai Framework

4. CONCLUSION

Based on the research and discussion results, the dimensions of the Sendai Framework can be concluded that strengthening begins sequentially from the descriptors of increasing human resource capacity, budgeting, community empowerment, and disaster regulations and policies. This dimension is strengthened by designing policies based on each descriptor to strengthen disaster risk governance optimally. Based on the design test of the disaster risk reduction governance strengthening policy in West Sumatra Province, the study's results showed that stakeholders stated that strengthening the dimensions of the Sendai Framework was acceptable.

This study has implications that conceptually and practically, it is a breakthrough in providing policy recommendations to the government to design regulations relevant to disaster risk management. As a recommendation, to strengthen the dimensions of the Sendai Framework, it is necessary to design and implement policies and programs to strengthen policies and regulations, community empowerment, increase human resource capacity, and budget related to disaster risk reduction in West Sumatra Province.

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