

Regulations and Concepts of Economic Mitigation in Disaster-Prone Communities in an Effort to Achieve Economic Relief Through Sustainable Living Systems

Nelly Azwarni Sinaga^{1*}, Afifi Lubis²

¹Al-Washliyah Institute of Business and Technology, Indonesia

²State Islamic University of North Sumatra, Indonesia

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Corresponding Author:

Nelly Azwarni Sinaga

email:

nellysinaga1964@gmail.com

ABSTRACT

Introduction: This study aims to analyze the regulatory and mitigation perspectives of Indonesia, which is traversed by the Pacific Ring of Fire and climate anomalies that cause Indonesia to experience various escalations of natural disasters. Post-natural disasters often give rise to problems that disrupt socio-economic systems. This article argues that for communities living in disaster-prone areas that are vulnerable to socio-economic life, economic regulation and mitigation are needed in an effort to achieve economic resilience for sustainable livelihoods.

Methods: This research is qualitative with a conceptual approach. Data collection uses secondary data collection techniques from various literature and relevant research results as well as empirical data based on observations and interviews.

Results: The results of the study, based on theoretical analysis and empirical findings, found that the concept of a sustainable livelihood system in disaster-prone areas in Indonesia is a top priority in mitigation efforts and community economic resilience. Government regulation and the implementation of legal sanctions against any person or company that damages natural resources are very urgent, especially in disaster-prone areas and are one of the main requirements for sustainable development.

Conclusion and suggestion: The collaboration between the government at all levels with social organizations, community leaders in all segments, academics and private companies, supported by valid data on victims and post-disaster damage, is key to minimizing the problems caused by disasters.

Keywords: Regulation, legal sanctions, Economic Reliability

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INTRODUCTION

Indonesia, which lies along the Pacific Ring of Fire, is an area prone to various disasters. Climate and seasonal anomalies contribute to Indonesia's increased risk of natural disasters. Learning from the experience of flash floods and landslides on the island of Sumatra, particularly in Aceh and North Sumatra Province, there are many lessons to be learned from different perspectives. The destructive effects of these natural disasters have claimed many lives and property. Disasters have caused profound trauma for those directly affected, especially those who lost homes, possessions, or family members due to the destructive effects of the disaster (BNPB, 2025). However, the entire community affected by the disaster will also feel the impact of this disaster. People are faced with limited and scarce necessities and the need to survive. Vital necessities such as clean water and electricity have been out for weeks, and in some areas, clean water has not reached homes for months. LPG (Liquefied Petroleum Gas) is also scarce, especially in 5-kg canisters. People are forced to queue for hours to obtain fuel for both private and public vehicles. The natural disaster that struck Sibolga City and Central Tapanuli Regency, North Sumatra Province, in November 2025 can be classified as a rapid-onset disaster, meaning a disaster that occurs quickly and lasts a short time. Often, the impact of natural disasters is beyond human expectations, leaving an impact on all elements of society after the disaster. Even for some people directly affected by the disaster, they had to drain their energy and thoughts on how to continue living while still hoping for assistance from the Regional Government and the Central Government (Adiyoso, 2018). Food and clothing aid flowed abundantly from the Government, social organizations, religious organizations, professional organizations, individuals, and others. Even six months after the disaster, this aid was still piling up in Regional Government warehouses and had not been distributed for reasons that are not yet understood. The press was busy reporting on the accumulation of aid, the Regional People's Representative Council (DPRD) spoke out criticizing the slow handling of aid distribution, adding to the complete problems that the Government must resolve. Ironically, it was suspected that the data on the disaster-affected community was inaccurate, due to the uneven distribution of aid, thus giving rise to a crisis of trust in the Government marked by demonstrations at Government Offices and the Regional People's Representative Council.

In addition to the issue of invalid community data, slow river normalization due to river silting, emerging tributaries, and road ditches covered in soil, resulting in constant flooding during rainfall. The rainfall remains quite high, causing anxiety and trauma among the community, especially in areas where landslides occurred. Months after the disaster, there has been no visible effort to rehabilitate the affected areas. Initial research revealed the urgency of the problem within the community lies in the rehabilitation of damaged public infrastructure and the river normalization that has not yet been realized. The problem is exacerbated by invalid data on communities affected by the disaster due to different criteria for aid recipients being viewed differently by sub-district/village officials, resulting in uneven distribution of disaster victims. Inadequate planning management, implementation, supervision, and coordination have resulted in low government mitigation efforts in post-disaster response (Eko Wahyono, 2023).

Planning and management within the resilience and sustainability approach to livelihoods still fail to consider mitigating resilient and sustainable community livelihoods post-disaster (Yang et al., 2023). Government policies and regulations are crucial in building community mitigation and resilience post-disaster, linked to economic activity, which directly impacts economic growth and stability. In fact, the delay in handling disaster-affected areas' rehabilitation is evident due to limited development assistance. Regional governments await assistance from the provincial government, while the provincial government awaits the central government's policy on the amount of assistance. Ultimately, communities must patiently await results based on the ability of the regional and provincial governments to obtain central government assistance. Based on the description above, the author will examine how regulations and concepts of economic mitigation in disaster-prone communities contribute to economic stability through sustainable livelihood systems (Sati & Vangchhia, 2017). Based on the description in the introduction above, the focus of the problems of this research is as

follows: How is the concept of economic mitigation in disaster-prone areas in an effort to maintain economic stability?, How is the government's policy in relieving the community's economy through the concept of a sustainable livelihood system. How are the concepts and policies of Environmental Governance in the context of Sustainable Livelihoods?

LITERATURE REVIEW

The normative architecture of disaster risk management in Indonesia is primarily grounded in Law No. 24 of 2007 on Disaster Management, which represents a paradigm shift from reactive emergency response to proactive risk reduction and mitigation (Bencana, 2026). Within public administration and disaster governance discourse, this legal framework establishes economic protection as a vital pillar of Disaster Risk Reduction (DRR). The legislation mandates the integration of risk assessments into regional development planning, spatial zoning, and livelihood protection schemes. By formalizing institutional accountabilities, the regulatory structure aims to mitigate structural vulnerabilities and safeguard the socio-economic foundations of populations exposed to recurring natural hazards. Economic mitigation is defined as a systematic set of structural and non-structural interventions designed to minimize material losses, income disruptions, and financial volatility caused by external hazards (Hallegatte, 2014). Structural mitigation focuses on diversifying economic assets and retrofitting productive infrastructure, whereas non-structural mitigation emphasizes financial risk transfer mechanisms such as micro-insurance, contingency funds, and market regulation alongside livelihood diversification (Cutter, 2008). In disaster-prone contexts, economic shocks exacerbate pre-existing socio-economic inequalities; thus, economic mitigation acts as a critical buffer that preserves household purchasing power and prevents vulnerable populations from falling into chronic poverty traps (The World Bank, Doing Business 2020, Comparing Business Regulation in 190 Economies, 2017).

The Sustainable Livelihoods Framework (SLF), pioneered by the Department for International Development (DFID, 1999), offers an analytical lens to examine the dynamic interplay between human, social, natural, physical, and financial capital within specific vulnerability contexts. In disaster-exposed environments, the sudden depletion of physical and financial capital severely impairs a household's adaptive capacity (Ellis, 2000). Consequently, building a sustainable livelihood system requires transforming institutional structures and policy processes to ensure equitable access, resource security, and rapid asset recovery following a shock (Chambers & Conway, 1992). Economic resilience refers to the capacity of a socio-economic system to absorb, adapt to, and recover from disaster-induced disturbances without collapsing or losing its core functional stability (Adger, 2000). In contemporary disaster scholarship, resilience extends beyond mere recovery (*bouncing back*) to encompass transformative capacity the ability to reconfigure local economic structures to withstand future contingencies (*bouncing forward*) (Manyena, 2011). The resilience of disaster-prone communities depends on livelihood elasticity, social safety nets, and the flexibility to reallocate economic capital when primary income sectors are disrupted (Folke, 2006).

Operationalizing resilient livelihoods requires inclusive, highly responsive local institutions and robust social protection mechanisms. Local institutional arrangements including cooperatives, microfinance institutions, and community-based organizations play a pivotal role in organizing collective action, managing local risks, and distributing post-disaster relief equitably (Aldrich, 2012). Furthermore, guaranteeing fair market access and expanding adaptive social protection networks (such as cash transfers and public works programs) are essential to sustaining local supply chains, protecting consumption, and accelerating macroeconomic recovery at the grass-roots level (Béné, 2012). Achieving sustainable economic resilience in disaster-prone communities demands a synergistic alignment between regulatory mandates and localized livelihood strategies. While disaster management regulations supply the macro-level governance, legal certainty, and resource allocation mechanisms, the Sustainable Livelihoods Framework provides the micro-level operational pathway for community empowerment (Twigg, 2015). When economic mitigation policies are

embedded into local livelihood practices, community resilience transforms from a passive state reliant on emergency assistance into an active, self-sustaining capacity to manage ongoing environmental risks(Wisner, 2004).

METHOD

This research methodology is qualitative with a conceptual approach. This study utilizes secondary data collection techniques from various literature and relevant research findings, as well as empirical data based on observations and interviews. The data analysis technique employed interactive analysis, ensuring a continuous dialogue and discursive nature of the research results(Miles et al., 2014). This allows for continuous refinement and improvement of the data and analysis throughout the research process.

RESULT AND ANALYSIS

Post-Disaster Economic Mitigation Concept

Indonesia, which is crossed by the Pacific Ring of Fire, plus climate and seasonal anomalies, is also involved in the escalation of various natural disasters, such as landslides, floods, abrasion, tornadoes, forest and land fires, earthquakes, tsunamis, droughts, and eruptions of Mount Merapi. As explained in Law Number 24 of 2007 concerning Disaster Management, the tragedy of flash floods and landslides can be categorized as natural disasters as referred of the law which reads: "Natural disasters are disasters caused by events or a series of events caused by nature, including earthquakes, tsunamis, volcanic eruptions, floods, droughts, hurricanes, and landslides(Undang-Undang, 2007). The destructive effects of natural disasters of any kind have claimed many lives and property.Throughout 2025 until December 31, the National Disaster Management Agency (BNPB, 2025)recorded 4,727 disasters occurring in various regions of Indonesia. Floods were recorded as the most frequent disaster with 2,009 incidents, followed by extreme weather with 958 incidents, forest and land fires (karhutla) with 1,329 incidents, landslides with 330 incidents, drought with 37 incidents, and tidal waves and abrasion with 28 incidents. Meanwhile, geological disasters such as earthquakes were recorded at 28 incidents, volcanic eruptions with 7 incidents, and 1 tsunami incident throughout 2025. This condition indicates the continued strong influence of rainfall high, changes in land use, and environmental management challenges in various regions.



Figure 1. Disaster Data in Indonesia throughout 2025

Source: BNPB, 2025

Natural disasters often create enigmatic realities, due to their unpredictable consequences. Socioeconomic vulnerability resulting from disasters stimulates complex problems in people's livelihood systems. While natural disasters are unavoidable, they can be minimized through understanding disaster mitigation and disaster preparedness. The threat of climate change is also intertwined with the escalation of natural disasters. Rapid changes resulting from disasters require appropriate local adaptation processes, including mitigation strategies and actions that foster resilience in livelihood systems (Tabares et al., 2022). Mitigation is a series of efforts to reduce disaster risks, both through physical development and awareness and increased capacity to face disaster threats of Law Number 24 of 2007 (Undang-Undang, 2007). The concept of disaster management in Indonesia has experienced a paradigm shift, from reactive emergency response to anticipatory disaster mitigation. The mitigation concept is based on the adaptation of local wisdom, by adjusting the characteristics of a region and the type of disaster that occurs. Protection against disaster threats is a basic human right, while the implementation of disaster management is the responsibility and authority of the Government and Regional Governments which is carried out in a planned, integrated, coordinated and comprehensive manner. Post-disaster resilience for sustainable livelihoods and fostering community resilience and resilience to disaster risk. While it is recognized that post-disaster livelihood systems remain an unstructured effort in economic mitigation, contemporary social realities related to mitigation are highly dynamic and diverse, making it crucial to develop a theory of economic mitigation within livelihood systems within the context of communities living in disaster-prone areas. Livelihood strategies for positive change are part of economic mitigation. Natural disasters such as earthquakes, floods, landslides, tsunamis, or volcanic eruptions will always have an economic impact on companies in all forms and also on the national economy (Rudiarto et al., 2019).

The concept of economic mitigation is predicted to be able to complement the theory of livelihood systems because the concept of economic mitigation is able to explain in more detail and specifically how the process of securing the community's economy is carried out. Economic mitigation aims to measure and control the financial impact of disasters, so that stakeholders have accurate information in post-disaster mitigation and recovery efforts. Economic mitigation in local community livelihood strategies is expected to have implications and implementation for sustainable livelihoods in disaster-prone communities. Good governance and management are the focus and priority of policymakers in the community's sustainable livelihood system (Pakkanna, 2025). However, in reality, disaster management in the context of post-disaster recovery still focuses on efforts to reduce the risk of physical disasters, but has not yet explored the longitudinal conceptual framework of post-disaster livelihood mitigation. As a result, post-disaster recovery, affected communities still rely on philanthropic charity for their livelihoods.

Community Economic Resilience Facing Sustainable Livelihoods

Sustainable livelihood systems should be able to diversify various sources of livelihoods based on community participation in ensuring resilience and resilience in anticipating and facing social vulnerabilities as a result of natural disasters. So far, rural communities are vulnerable in situations of vulnerability and crisis and remain a paradox in community empowerment. Inequality in access to the utilization of asset capacity (tangible and intangible assets) at the individual and community levels has not optimally encouraged the livelihood systems of vulnerable communities, especially those prone to disasters and poverty, even though strengthening livelihood assets (both tangible and intangible assets) can be positively intertwined with livelihood strategies in maintaining and even increasing their livelihood productivity (Wijayanto et al., 2019). In addition, according to (Rudiarto et al., 2019) shows that many disaster-affected communities still depend on direct financial assistance for consumption needs from philanthropic institutions. In principle, this will actually worsen the vulnerability of people's lives after a disaster.

The urgent restructuring of disaster areas is not solely for the sake of people's comfort, but rather to ensure they can continue their lives with comfort and ease of doing business.

Farmers can cultivate their rice fields and plantations without worrying about floods and landslides. Cattle, buffalo, and goat breeders can graze their livestock with the availability of green grass free of mud. Chicken, duck, and goose breeders can raise livestock with the availability of fodder. Traders can obtain merchandise smoothly thanks to smooth and safe traffic flow. Fish farmers can ship their fishery products thanks to land transportation that allows for fish trucks. Transportation and travel service providers can utilize the smooth roads, increasing the flow of passengers into and out of Sibolga City and Central Tapanuli, while also increasing tourism to both areas. Cafes and restaurants can thrive due to the availability of sufficient supplies and increased visitor numbers as the community's economy recovers (Arif & Rianto, 2025).

The Regional Government, Provincial Government and Central Government through policies that favor the people must synergize and coordinate in efforts to resolve post-disaster problems in disaster areas and their surroundings. The government is the main actor that has the authority and responsibility in handling and resolving the impacts of disasters from both a social and economic perspective. This is as stipulated in the Disaster Management Law, Article 7 (1) which states that the Government's authority in implementing disaster management includes: a. determining disaster management policies in line with national development policies; b. making development plans that include elements of disaster management policies; c. determining the status and level of national and regional disasters; d. determining cooperation policies in disaster management with other countries, agencies, or other international parties; e. formulating policies on the use of technology that has the potential to be a source of disaster threats or dangers, formulating policies to prevent the control and depletion of natural resources that exceed nature's ability to recover; and g. controlling the collection and distribution of money or goods on a national scale (Kalinina, 2016). Furthermore, Article 8 of the Disaster Management Law explicitly states that the responsibility of regional governments in implementing disaster management includes: a. guaranteeing the fulfillment of the rights of communities and refugees affected by disasters in accordance with minimum service standards; b. protecting communities from the impacts of disasters; c. reducing disaster risks and integrating disaster risk reduction with development programs; and d. allocating adequate disaster management funds in the Regional Revenue and Expenditure Budget. On the other hand, based on the provisions of Article 26 (2) of the law, it is emphasized that every person affected by a disaster has the right to receive assistance to fulfill basic needs (Maryanti et al., 2019). In other words, the Government's obligation through its authority and responsibility is to fulfill the rights of communities affected by disasters in fulfilling their basic needs. It can even be interpreted as fulfilling sustainable livelihood needs through physical assistance and community independence capabilities, so that communities return to being independent, safe and comfortable in carrying out activities to continue their lives as they should.

According (Tabares et al., 2022) rural sustainable livelihood strategies consist of two social activities, namely those based on natural resource products (agricultural crops, livestock, and non-agricultural natural resources) and those based on non-natural resource products (village trade activities, village industry, and remittances), both of which can be alternative livelihood strategies for strengthening rural entrepreneurial capacity. Livelihood strategies that optimize social activities based on natural resource products and non-natural resource products will have an impact on ensuring a more decent livelihood (increasing income stability, risk levels, and seasonal vulnerability) as well as ensuring environmental sustainability (soil quality, water, forests, and biodiversity) (Rahma, 2018). In line with that, (Thulstrup, 2015) stated that efforts to transform sustainable community livelihood systems are also inseparable from access that can be obtained through social relations (gender, social class, age, and ethnicity), institutions (rules and customs, land ownership, and markets), and organizations (associations, NGOs, local governments, and state institutions). Then Scoones (1998) also emphasized the understanding of sustainable livelihood systems in rural areas by linking conditions, contexts, and various trends and shocks and vulnerabilities (Widayanthi & dkk, 2025) that can affect livelihood sources (natural capital, financial capital, human capital, social capital, physical capital). Changes in livelihood sources can also affect organizational

structures and institutional processes, which are then related to livelihood system strategies, which ultimately are intertwined with the sustainability of livelihood systems(Rosyanti & dkk, 2025).

In fact, the Tsu Chi Buddhist Foundation, as a social organization, moved faster to help realize Permanent Housing (Huntap) by building 76 Huntap units out of 200 units planned in Parombunan Village, Sibolga City. The Tsu Chi Buddhist Foundation provides solutions in the housing aspect by helping people who lost their homes in Sibolga City. However, in the Central Tapanuli Regency area, due to invalid data on disaster victims, there has been no completion of Permanent Housing (Huntap) of 118 housing units planned as replacement homes for people who lost their homes and were severely damaged. Through Regional Government policy, disaster victims were moved to the Hajj dormitory in Pinangsori which has never been used according to its intended purpose as temporary housing. The community can only wait for policies and regulations from the Central Government, Provincial Government, and Regional Government. Apart from Huntap, the community is also still waiting for public facilities to be repaired, such as repairing damaged roads that have even collapsed or disappeared, normalizing river flows, broken bridges, dredging ditches that are level with the road, clearing logs that are still piled up, and so on(Ellis, 1998).

Indonesia is a country vulnerable to and familiar with disasters, as they occur almost annually in several regions across the country, with varying types. However, the high escalation of disasters and their destructive effects have not been minimized, and instead, they always leave scars and sorrow for the community. Learning from natural signs and experiences of disaster impacts, it is appropriate to mitigate risks and take anticipatory measures to mitigate their destructive impacts. However, disasters still leave lives, property, livelihoods, and infrastructure destroyed, threatening the sustainability of livelihoods. The aftermath of a natural disaster has become a "domino effect" of chronic social pathology that can disrupt the socio-ecological cycle. Not only is it psychologically traumatic, but it also hinders the ability to find new alternative sources of livelihood. Post-disaster, communities should be able to take appropriate economic mitigation measures to prevent their livelihoods from stagnating and becoming mired in the power of prolonged traumatic wounds, resulting in recovery only limited to the rhetoric of philanthropic programs that always dictate that people become passive receivers. Post-disaster, communities need to adapt and manage their livelihoods by utilizing accumulated capital resources resiliently to face the pressures of life (Eko Wahyono, 2023)

For communities close to the source of the disaster, it leaves deep trauma, especially those who lost family and possessions. But life goes on, and livelihoods must be continuously managed. Disasters cannot be avoided, but they can be minimized. Economic mitigation is a priority that must be considered in reducing the destructive impact of disasters(Utomo & Marta, 2022). Economic resilience must be instilled to spur revival and resilience toward economic independence. Cumulatively, several factors need to be focused on, including:

- a. Involvement of all stakeholders, starting from government officials at all levels, private entrepreneurs, social organizations, community leaders, youth leaders, religious leaders, economists, professional groups, non-governmental organizations and universities.
- b. Availability of valid data on the classification of the number of people affected by disasters, types of livelihoods, infrastructure damage, damage to public facilities and infrastructure supporting the community's economy.
- c. Equal distribution of aid, especially aid for production tools, building materials for repairing houses and business premises to disaster-affected communities according to their classification according to applicable provisions.
- d. Distribution of aid through the People's Business Credit (KUR) program without interest or with soft loan interest for Micro, Small and Medium Enterprises (MSMEs) through Banking or loans from Government Agencies that distribute loans for MSME businesses.

Disaster mitigation is necessary to reduce the occurrence of disasters, reduce disaster risks, and increase preparedness in the face of disasters. Mitigation is not only aimed at saving

lives and property but also at preserving the economy during and after natural disasters. Because communities living in disaster-prone areas rely primarily on natural resources for their livelihoods, these livelihoods will be disrupted and problematic when a disaster strikes(Cahyono, 2014)(Bakhtiari & Sajjadih, 2018).

As stipulated in Law No. 32 of 2009 concerning Environmental Protection and Management, environmental management must be carried out sustainably and equitably, taking into account social, economic, cultural, and ecosystem interests as a whole. The state is also obligated to prevent environmental pollution and damage. One fundamental principle is the principle of state responsibility, which mandates that the state is responsible for ensuring the utilization of natural resources for the welfare of society, now and in the future. The principles of Law No. 32 of 2009 emphasize openness, public participation, and a balance between the use of natural resources and environmental preservation. The concept of Good Environmental Governance in environmental management in Indonesia refers to the principles of good environmental governance as stipulated in Article 2 of Law No. 32 of 2009. The principle of sustainability and continuity emphasizes the responsibility of each individual in maintaining the carrying capacity of the ecosystem and improving environmental quality. This principle is intended to ensure that natural resources can be enjoyed by present and future generations(Chambers, 1995).

Therefore, reforestation and river flow normalization are urgent and central to disaster mitigation, ensuring Indonesia is no longer prone to disasters. Reforestation and river normalization act as a shield to reduce the risk of landslides and flash floods, and preserve sustainable natural resources for future generations to enjoy. Strict sanctions against illegal logging and deforestation must be enforced to prevent encroachment that harms many people. Putting the interests of the public above personal interests is the philosophy of the Indonesian people, who have the right to a decent and sustainable livelihood.

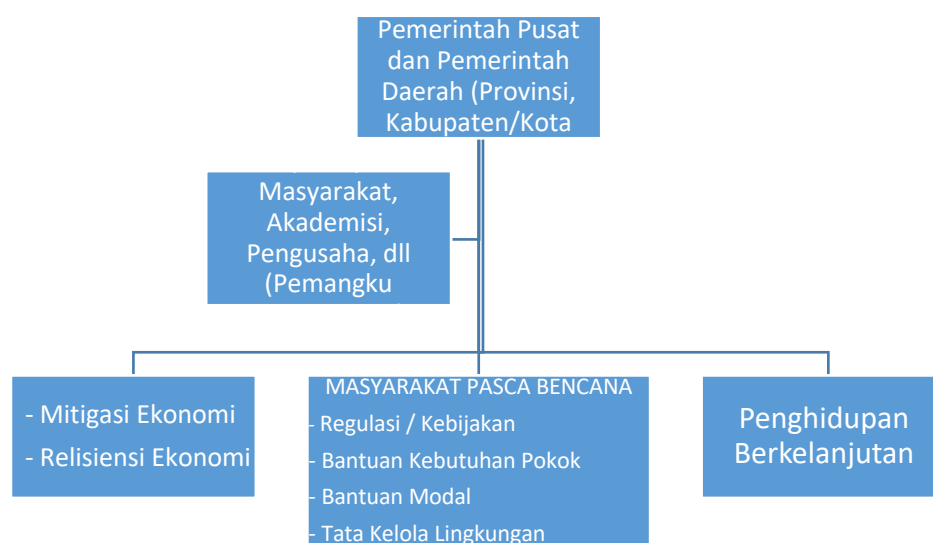


Figure 2. Economic Mitigation and Economic Resilience Flow Post-Disaster

Source: Research Analysis, 2025

The central government, regional governments down to the sub-district/village level, academics, non-governmental organizations, community leaders, and the entire community work together to create sustainable environmental management solutions. Increasing public education and awareness about the importance of environmental protection and disaster preparedness also needs to be a priority within the concept of sustainable livelihoods. In other words, disaster management efforts should not only be reactive but also preventive and adaptive, thus minimizing the risks and impacts of disasters and ensuring the sustainability of community life in disaster-prone areas(Rosyanti & dkk, 2025).

CONCLUSION

The concept of mitigation has proven incapable of providing post-disaster resilience to communities. Similarly, economic mitigation has not been able to provide economic resilience, leading to strength and resilience, leading to community economic independence for sustainable livelihoods. Disasters always leave behind problems and issues for communities in affected areas, often coming suddenly. Communities and governments almost always fail to detect and anticipate disasters, especially with limited preparedness in terms of personnel and disaster management equipment. This research recommends that the government implement strict sanctions against individuals and companies that damage the environment, encroach on forests, and destroy rivers to protect and preserve natural resources from damage that can lead to landslides and flash floods. Through the concept of Good Environmental Governance and the implementation of laws and regulations, the government becomes the front guard and security in maintaining the balance and continuity of environmental conservation. The government, as the spearhead in disaster management through regulations and the availability of disaster management budgets, becomes the mainstay and support of the hopes of communities affected by disasters or those affected by disasters. Improvements to road and bridge infrastructure, river normalization, housing assistance, and business capital are crucial for reviving economic activity and sustaining community livelihoods.

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