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Hydrometeorological Disaster Impacts on Community Economies and Infographic-Based Recovery Policy Strategies in West Sumatra

Article Identity

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Abstract

Hydrometeorological disasters cause not only physical damage but also substantial disruptions to livelihoods and local economic activities. This study examines the economic impacts of hydrometeorological disasters and identifies priority strategies for post-disaster economic recovery in West Sumatra, Indonesia. A qualitative approach was employed through semi-structured interviews with 60 disaster-affected informants. The interview data were analyzed thematically, while the Analytic Network Process (ANP), based on assessments from five experts, was used to determine priority factors, problems, and policy alternatives. The thematic analysis revealed that 68.3% of informants experienced disruptions to electricity and/or clean water, 33.3% experienced road, bridge, or mobility disruptions, and 55.0% reported decreased or completely interrupted income. Moreover, 66.7% of informants expected productive assistance, including business capital, work equipment, and stock replacement. The ANP results identified infrastructure as the most influential recovery factor followed by economic and financial factors and human resources. Loss of productive assets and damage to road and bridge infrastructure emerged as the major recovery problems. The highest-priority policy alternatives were road and bridge infrastructure improvement, productive capital assistance, and entrepreneurship development. These findings demonstrate that effective post-disaster economic recovery requires an integrated approach combining infrastructure restoration with livelihood recovery and productive capacity development.

Keywords: Analytic Network Process; Economic Recovery; Hydrometeorological Disasters; Infrastructure; Livelihoods; West Sumatra.

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INTRODUCTION

Various regions in Indonesia are facing increasing extreme weather and climate events influenced by the dynamics of environmental change and human activities. High-intensity rainfall, prolonged droughts, storms, and changes in seasonal patterns can develop into disasters when they occur in areas with high levels of vulnerability. These conditions have the potential to cause loss of life, damage infrastructure, and disrupt social and economic activities (Wu et al., 2016). One type of disaster that frequently occurs in Indonesia is hydrometeorological disasters, namely disasters related to meteorological, climatological, and hydrological phenomena, such as floods, droughts, storms, and landslides triggered by extreme weather and climate conditions (Giannaros et al., 2020 and Yoesra, 2025). The impacts are multidimensional, not only damaging the environment and infrastructure but also affecting the sustainability of development and community well-being.

West Sumatra Province has diverse topographic characteristics, coastal and lowland areas to hilly and mountainous regions, and is supported by relatively high annual rainfall. These conditions make some areas highly vulnerable to various types of disasters. Based on data from the West Sumatra Badan Penanggulangan Bencana Daerah (BPBD) during the 2014–2024 period, 8,503 disaster incidents were recorded across 19 districts/cities. The most frequent types of disasters include extreme weather, landslides, and floods. The dominance of these incidents indicates that hydrometeorological disasters are one of the main threats in the disaster dynamics in West Sumatra (BPBD Provinsi Sumatera Barat, 2025).

In late November 2025, heavy rain accompanied by strong winds occurred continuously in several areas of West Sumatra. This condition increased river flow, causing water overflows that triggered flooding, flash floods (galodo), and landslides in various districts and cities. According to the West Sumatra Disaster Data, this series of disasters affected 16 districts/cities with a population of 297,232 people. Of this number, 264 people died, consisting of 233 identified victims and 31 victims who were not yet identified. In addition, 72 people were recorded as missing, 401 people were injured, 150 people were displaced, and 296,345 people suffered or were affected by the disaster (BPBD Provinsi Sumatera Barat, 2025).

The impacts of disasters can extend beyond physical damage and impact various social and economic aspects of society. Giannaros et al. (2020) identified a link between hydrometeorological characteristics, the magnitude of flood discharge, and the intensity of the resulting socio-economic impacts. Similarly, Koks et al. (2019) showed that infrastructure damage caused by flooding can hamper business activities and cause indirect economic losses through the disruption of infrastructure services and supply chain disruptions. Benson & Clay (2004) emphasized that disaster impact studies often focus too much on direct physical losses, whereas disasters can also affect the flow of goods and services, community incomes, public finances, economic growth, income distribution, and poverty levels. These impacts can be long-term, as demonstrated by Boustan et al. (2020) who found that severe disasters can encourage outmigration, reduce housing values, and increase poverty in affected areas. WTO also explains that the impact of disasters can spread through decreased production, disruption of trade and supply chains, damage to infrastructure, and weakening of business activities, especially among community groups and business actors with limited economic capacity.

The above description shows that the impact of hydrometeorological disasters goes beyond physical damage and infrastructure, but develops into a series of interconnected economic disruptions. Damage to roads, bridges, and other supporting infrastructure can hamper work mobility, limit public access to markets and businesses, and disrupt the continuity of daily economic activities. These conditions can ultimately impact household incomes, increase the cost of living, and weaken the economic resilience of communities, particularly casual laborers, small business owners, and groups that rely heavily on smooth mobility and market access (Lan et al., 2019).

Although research on the impact of disasters has developed, studies specifically explaining the economic experiences of communities at the micro level due to hydrometeorological disasters in West Sumatra are still relatively limited. Zein et al. (2014) examined the impact of the 2009 West Sumatra earthquake on regional economic growth based on GRDP indicators, thus not directly reflecting changes in economic activity experienced by the community. Meanwhile Mutia & Wijayanto (2025) analyzed the socio-economic impact of the 2024 galodo in Pandai Sikek Village using a descriptive quantitative approach, but their study was limited to one village and one disaster event. Other studies have focused more on nature-based mitigation and opportunities for post-disaster regional transformation Bănică et al. (2020). These studies have not yet integratedly explained how infrastructure damage and mobility disruptions affect employment, business activities, income, and community adaptation strategies, nor how the needs of affected communities can be translated into solutions and policy priorities for economic recovery.

Post-disaster economic recovery requires an integrated policy approach because infrastructure damage, disruptions to economic activities, financial constraints, and community vulnerability are interconnected. However, previous studies have primarily focused on assessing disaster impacts, with limited attention to systematically determining recovery policy priorities based on the interrelationships among economic, infrastructure, and human resource factors. This highlights the need for a decision-making framework capable of evaluating multiple interdependent criteria. The Analytic Network Process (ANP) provides a suitable approach by incorporating dependencies and feedback among criteria and alternatives to establish relative priorities (Saaty, 2004b). Accordingly, the novelty of this study lies in

integrating community-level economic impact assessments with ANP-based policy prioritization to identify strategic recovery interventions following the 2025 hydrometeorological disasters in West Sumatra. Furthermore, the study translates its findings into policy-oriented infographics to facilitate the communication of recovery priorities to policymakers and relevant stakeholders.

Based on these gaps, this study focuses on the economic impact of the hydrometeorological disasters in late 2025 on communities in several affected areas in West Sumatra. The analysis aims to understand changes in work mobility and daily economic activities, the continuity of jobs and businesses, access to economic activities, changes in income, and community adaptation strategies during the post-disaster recovery process. These findings are then used as a basis for formulating and prioritizing economic recovery policy solutions in disaster-prone areas. To ensure broader utilization by practitioners, the government, and the public, the findings regarding disaster impacts and policy recommendations are also visualized through informative and communicative infographics. This not only provides an understanding of the economic conditions of affected communities but also supports the delivery of policies that are more easily understood and applicable.

RESEARCH METHODS

This study uses a qualitative approach with thematic analysis combined with the Analytic Network Process (ANP) method to gain an in-depth understanding of the impact of hydrometeorological disasters on work mobility and community economic activities and to determine post-disaster economic recovery policy priorities in West Sumatra. The research process began with the collection and analysis of data on the economic impacts and disruptions to community work mobility after the disaster. A total of 60 informants from the affected community were selected using a purposive sampling technique based on the criteria of residing in the affected area and directly experiencing the hydrometeorological disaster by the end of 2025.

Data were collected between June and August 2026 through in-depth interviews using semi-structured guidelines to explore the conditions of economic activity before and after the disaster, changes in work mobility, job and business continuity, changes in income, adaptation strategies, economic recovery dynamics, and the contribution of government assistance and institutional support. Interview data were analysed descriptively and thematically to identify impact patterns and community recovery needs. Data validity was strengthened through source triangulation by comparing information obtained from in-depth interviews with disaster-affected communities against field observations and supporting documents from local government institutions, including BPBD and BAPPEDA. The triangulation process involved cross-checking informants' accounts of infrastructure damage, disruptions to work mobility, income losses, and economic recovery conditions with available disaster reports and official records. Similarities and discrepancies between these sources were examined to assess the consistency and credibility of the findings, thereby providing a more comprehensive understanding of the socioeconomic impacts of hydrometeorological disasters.

Furthermore, the validated interview data were systematically organized and analyzed using thematic analysis to identify recurring patterns and similarities across informants' experiences. The analysis involved reviewing interview transcripts, coding relevant statements, and grouping similar codes into broader categories based on their conceptual relationships. These categories were then consolidated into overarching themes representing the major socioeconomic impacts of the disaster, including infrastructure disruption, economic and financial challenges, and human resource-related issues. The resulting themes provided a structured understanding of community recovery needs and served as the basis for developing the criteria and alternatives used in the Analytic Network Process (ANP) analysis.

The results of the thematic analysis then become the basis for compiling criteria and policy alternatives analysed using ANP. The ANP assessment was obtained through a paired comparison questionnaire given to five resource persons from the policy stakeholders, namely the Head of the BAPPEDA Division of West Sumatra Province, Analyst/Expert of BAPPEDA Research and Development of Padang Pariaman Regency, Analyst/Expert of BAPPEDA Padang Panjang City, Head of BPBD Division of Padang Pariaman Regency, and Head of BAPPEDA Research and Development of Tanah Datar Regency.

Table 1. *Inclusion Criteria and Verification of Research Informants (n = 60)*

No.	Inclusion Criteria	Verification / Supporting Evidence
1	Residing in disaster-affected areas	Residential information and confirmation of affected locations
2	Directly experiencing the 2025 hydrometeorological disaster	Personal accounts of the disaster, supported by field observations or available documentation
3	Experiencing disruption to economic activities	Employment disruption, business interruption, income loss, or reduced economic activity
4	Experiencing damage or disruption to livelihoods	Reported damage to productive assets, workplaces, transportation access, or business facilities
5	Having firsthand knowledge of post-disaster recovery	Direct experience of adaptation, livelihood recovery, or receiving recovery assistance

The selection of resource persons was carried out purposively based on their knowledge, experience, and involvement in development planning, disaster management, and post-disaster community economic recovery. The ANP method is used to identify the interrelationships between criteria and determine the priority level of policy alternatives systematically based on economic impacts, disruption of access and work mobility, and the need for post-disaster intervention. The following is the method flow using the ANP method and the research model used.

In ANP, the decision structure is structured in the form of clusters and nodes. Clusters are groups of elements that have specific functions, characteristics, or relationships within a decision network, while nodes are individual elements within a cluster and are the objects of assessment in pairwise comparisons. Influence relationships in ANP can occur between nodes within the same cluster or between nodes in different clusters. This network structure allows ANP to model dependencies and feedback loops that cannot be adequately represented by a linear hierarchical structure (Ascarya, 2005).

In this study, the model structure was built based on three main clusters: economics and finance, infrastructure, and human resources. Each cluster consists of nodes representing post-disaster recovery issues and needs, derived from literature analysis and field findings. The relationships between nodes were then confirmed by experts and used to form the ANP network. These relationships were then assessed using a pairwise comparison questionnaire to determine the priority weights for each element.

The initial stage is carried out by compiling a pairwise comparison matrix. The value of a_{ij} indicates the level of importance or relative influence of element i on element j, with the following reciprocal properties (Saaty, 2004b) :

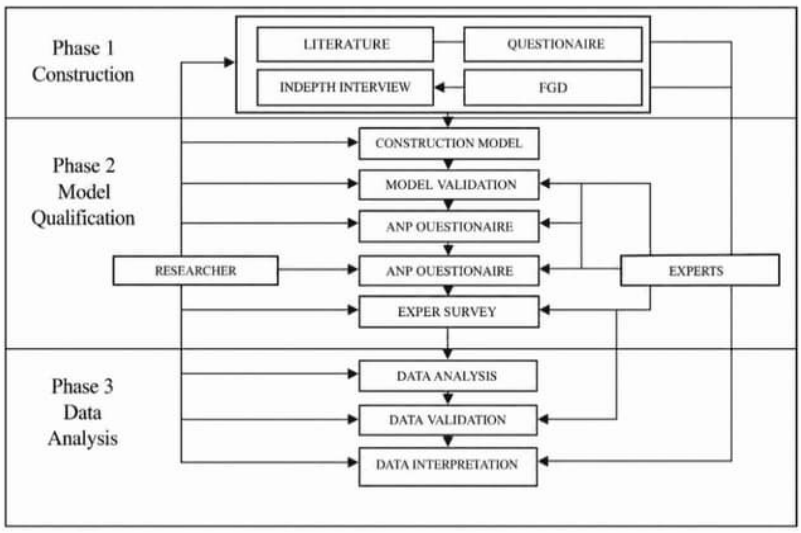


Figure 1. *Analytic Network Process Research Flow*

$$W = \begin{bmatrix} c_{11}W_{11} & c_{12}W_{12} & \dots & c_{1m}W_{1m} \\ c_{21}W_{21} & c_{22}W_{22} & \dots & c_{2m}W_{2m} \\ \dots & \dots & \dots & \dots \\ c_{m1}W_{m1} & c_{m2}W_{m2} & \dots & c_{mm}W_{mm} \end{bmatrix}$$

where W_{ij} is a submatrix containing the priority vector of the influence of nodes in a cluster C_i on nodes in the other cluster. With this structure, the supermatrix can represent dependency and feedback relationships within and between clusters C_{ij}. The priority weight of each element is obtained from the principal eigenvector of the pairwise comparison matrix, which is expressed as:

$$A\omega = \lambda_{max}\, \mathrm{w}$$

where A is the pairwise comparison matrix, ω is the priority weight vector, and λ_{max} is the maximum eigenvalue of the matrix. This principle of ratio measurement and the use of relative priorities is the mathematical foundation of ANP. Because the ANP assessment in this study involved several experts, the pairwise comparison values can be aggregated using the geometric mean. This approach maintains the ratio and reciprocal nature of the pairwise comparison matrix. The aggregation formula is Saaty & Vargas (2007):

$$a_{ij}^{G} = \left(\prod_{r=1}^{R} a_{ij}^{(r)} \right)^{\frac{1}{R}}$$

By a_{ij}^{G} is the aggregate value of the comparison between elements i and $j, a_{ij}^{(r)}$, is the assessment value given by the r-th expert, while R indicating the number of experts involved in the assessment process.

Table 2. *Basis for Designing a Priority Model for Post-Hydrometeorological Disaster Policies*

Model Components	Elements in the ANP Model	Literature Finding	Source
Criteria Cluster	Economics and Finance	Disasters cause changes in livelihoods, job losses, increases in the prices of necessities, business interruptions, crop failures, loss of livestock, and people's dependence on aid and savings.	Anwar et al. (2022); Asy'ari, (2018), Ratnaningsih et al. (2023)
	Infrastructure	Damage to roads, bridges, public facilities, houses, sanitation and clean water supplies hampers mobility and community economic activities.	(Anwar et al., 2022; Asy'ari, 2018)
	Human Resources	Changes in livelihoods and the loss of sources of livelihood require communities to adapt, rebuild businesses, and improve economic skills post-disaster.	Parvin et al. (2016)
Problems	Prices of basic necessities are increasing	Distribution disruptions due to broken roads cause shortages and increases in the prices of people's necessities.	Ratnaningsih et al. (2023)
	Loss of productive assets	Damage to work tools, agricultural land, crop failure, loss of livestock, and disruption to gardening activities reduce the assets that people use to earn income.	Anwar et al. (2022)
	Loss of property assets	Disasters cause damage to homes, buildings and various physical assets of the community and increase the need for reconstruction costs.	Anwar et al. (2022); Asy'ari, (2018); Ratnaningsih et al. (2023)

Model Components	Elements in the ANP Model	Literature Finding	Source
	Damage to road/bridge infrastructure	Cut-off roads, traffic jams, and damage to roads, bridges, and public facilities hinder people from getting to work and carrying out economic activities.	Anwar et al. (2022); Asy'ari, (2018), Ratnaningsih et al. (2023)
	Dependence on government assistance	Affected communities need assistance to sustain their lives and restore their economic conditions after the disaster.	Anwar et al. (2022); Asy'ari, (2018), Ratnaningsih et al. (2023)
	Disruption of sanitation	Floods cause disruption to sanitation and the availability of clean water, thus worsening the living conditions of post-disaster communities.	Data founded from interview
	Trauma from disaster events	Non-material impacts and post-disaster stress are considered as part of the community's recovery needs.	Data founded from interview
Policy Alternatives	Temporary shelter/residential housing/building materials assistance	Damage to homes and property requires support for housing restoration and materials for rebuilding.	(Anwar et al., 2022; Asy'ari, 2018)
	Productive capital assistance	Economic recovery can be achieved by providing business capital and financing to affected economic actors.	Parvin et al. (2016)
	Basic food/consumptive assistance	Assistance is needed to meet the needs of the community while sources of income and economic activity have not recovered.	Parvin et al. (2016); Asy'ari, (2018a)
	Diversification of income	Changes in livelihoods and job losses indicate the need for alternative sources of income to increase people's economic adaptability.	Ratnaningsih et al., 2023
	Infrastructure improvements	Restoring roads, bridges, and public facilities is necessary to reopen mobility and support the continuation of economic activity.	Asy'ari (2018)
	Improvements to sanitation, water and electricity	Disruptions to sanitation and clean water require the restoration of basic services as part of the post-disaster recovery process.	Data founded from interview
	Socialization/trauma healing	Psychosocial support is included to respond to the non-material impacts experienced by communities post-disaster.	Data founded from interview
	Entrepreneurship development workshop	Business mentoring, as well as counseling and training for the creative economy and MSMEs, are needed to help communities rebuild their economic activities.	Hakim et al. (2022)
	Financial management workshop	Capital, credit, and business recovery support need to be accompanied by increased financial resource management capabilities to ensure more sustainable business recovery.	Hakim et al. (2022)

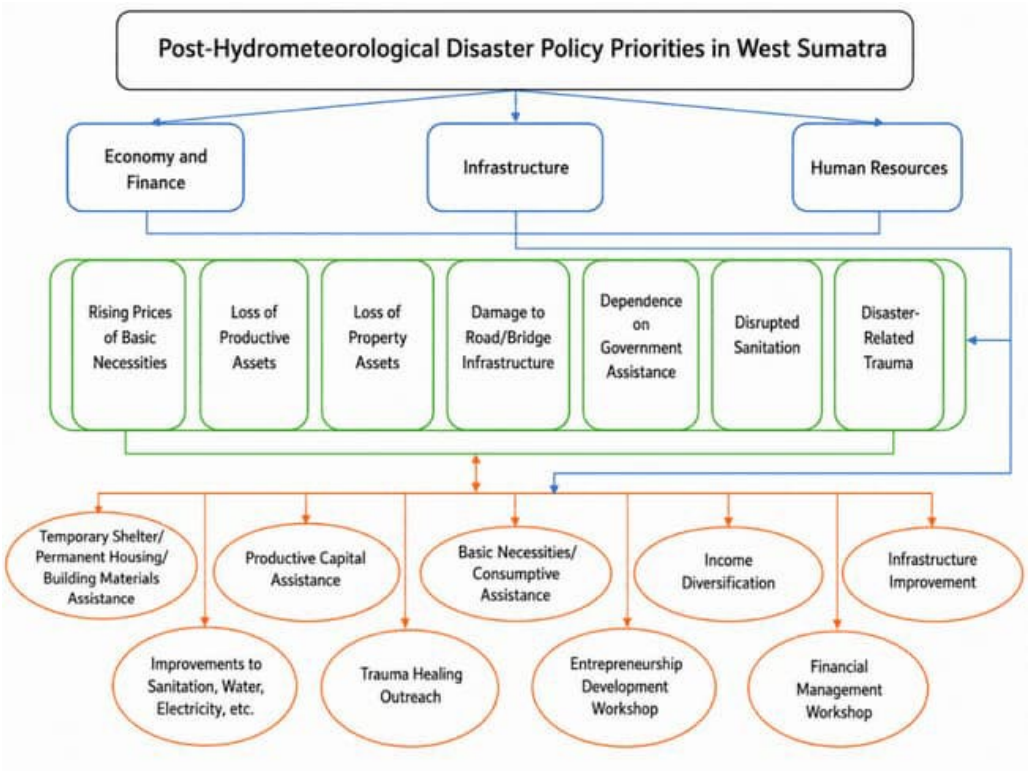


Figure 2. *ANP Model of Post Hydrometeorological Disaster Policy Priorities in West Sumatera*

Recommendations for contextual economic recovery policies are based on the real needs of affected communities. This research is based on the conceptual hypothesis that post-hydrometeorological disaster economic recovery cannot be achieved through a single intervention, but requires integration between infrastructure restoration, productive economic support, and human resource capacity building. Infrastructure damage is expected to hamper work mobility and economic activity, while the loss of productive assets and income sources increases the community's need for capital support and business capacity development. Through the ANP, the interrelationships between these various problems and policy alternatives are analysed to determine the highest-priority policies. To improve the effectiveness of the utilization and communication of research results, policy recommendations are then visualized in the form of policy infographics so that information regarding impacts, community needs, and recovery priorities can be conveyed concisely, clearly, and easily understood by policymakers and the wider public.

RESULTS AND DISCUSSION

The hydrometeorological disaster in West Sumatra at the end of 2025 caused extensive physical damage to settlements, infrastructure, and agricultural land. Thematic analysis of the interview data yielded nine main themes representing the informants' experience patterns, forms of impact, and needs, as presented in Table 2. The frequency of each theme indicates the number of informants who provided information relevant to that category. The coding process was non-mutually exclusive, so one informant could be identified in more than one theme. Therefore, the percentages for each theme are not cumulative.

Table 3. *Summary of Hydrometeorological Disaster Impact*

No	Main Theme	Informants	Percentage
1	Power and/or clean water disruptions	41	68.3%
2	Evacuate or live temporarily elsewhere	37	61.7%
3	Income decreases or stops	33	55.0%
4	Roads, bridges, or mobility is disrupted	20	33.3%
5	Houses are damaged, lost, or in unsafe locations	18	30.0%
6	Stock, business premises, raw materials, or work tools are damaged or lost	16	26.7%
7	Trauma, fear, psychological stress, or loss of a family member	12	20.0%
8	Aid is dominated by basic needs and emergency assistance.	47	78.3%
9	Expecting capital, work tools, or productive assistance	40	66.7%

The table above presents the findings derived from the thematic analysis of in-depth interviews with 60 disaster-affected informants. The results of the data analysis show that disruptions to infrastructure and essential services were one of the most prominent aspects of the affected communities' experiences. A total of 68.3 % reported disruptions to electricity and/or clean water supplies, whilst 33.3 % experienced damage to or obstructions on roads and bridges. The high frequency of these two themes indicates that the economic impact of the disaster stems not only from direct damage to homes, land and business premises, but also from the reduced functionality of the infrastructure networks that underpin the community's economic activities. Infrastructure damage can be categorised into direct physical damage and indirect functional losses. Direct physical damage refers to severed roads, damaged bridges, lost irrigation networks, or electricity and water facilities that are rendered unusable. Meanwhile, functional losses arise when such damage causes communities to lose access to workplaces, markets, customers, raw materials, public services and distribution networks. Consequently, the extent of the economic impact is determined not only by the value of the damaged infrastructure assets, but also by the breadth of social and economic activities that depend on that infrastructure.

Systemic disruption is evident in the damage to roads and bridges, which has cut off communities' access to centres of economic activity. According to an informant in Padang Pariaman Regency, a bridge in Nagari Anduriang, 2x11 Kayu Tanam District was severed as a result of the disaster. This damage has affected access for around 6,000 households living in the area (Figures 3 and 4). To maintain their daily mobility, residents are using simple rafts made from metal drums to cross the river. This makeshift crossing is used by residents to leave the village, whether to work, trade or purchase essential goods. This situation demonstrates that infrastructure damage not only restricts physical mobility but also hinders the flow of goods, services, labour, and community consumption activities. Although the community has endeavoured to build alternative access routes independently, the capacity and safety standards of these facilities remain limited; consequently, they are not yet able to fully replace the bridge's function as the primary link for social and economic activities.



Figure 3. *One of the Bridges Destroyed by the Hydrometeorological disaster in Padang Pariaman Regency*



Figure 4. *Residents are Crossing the River on Makeshift Rafts Following a Hydrometeorological disaster in Padang Pariaman Regency*

Infrastructure rehabilitation must be implemented simultaneously with livelihood recovery interventions. Reopening roads without support in the form of supplies, tools, and business capital is insufficient to revive community economic activity. Conversely, capital assistance will also be inadequate if market access, electricity, clean water, or irrigation have not yet been restored. Therefore, these two forms of intervention need to be synchronized so that the recovery process does not stop at restoring the physical function of the area but also restores the community's capacity to work, produce, conduct transactions, and earn income.

A total of 66.7 % are hoping for assistance in the form of business capital, tools, seeds, fertiliser, restocking, or other forms of productive aid. The predominance of productive needs indicates that communities are not only hoping for consumptive aid, but also for the means to restore their economic self-reliance. Karki et al. (2022) highlight the importance of shifting post-disaster assistance from the distribution of basic necessities towards livelihood recovery through productive assets, cash grants, labour-intensive activities, and support tailored to the community's employment context. Delayed or inappropriate livelihood assistance can lead people to sell assets, take on debt, or become dependent on aid for a longer period. Further evidence is provided by De Mel et al. (2012) who found that limited access to capital hinders the recovery of micro-enterprises following a disaster. Capital assistance accelerates the recovery of profits, particularly in the trade sector, whilst the recovery of manufacturing and service enterprises is also influenced by disruptions to supply chains and demand. These findings support the results of this study, which indicate that capital assistance needs to be provided in a targeted manner and should not be treated as a sole solution. Capital can accelerate the recovery of traders whose markets are beginning to function, but its benefits are more limited if raw materials are not yet available, transport links remain disrupted, or public demand has not yet recovered.

Table 4. *Recovery needs expected by informants*

Form of need	Informants	Percentage
Business capital, work tools, stock, or productive assistance	40	66.7%
Residential repair or construction	18	30.0%
Road, bridge and access repairs	15	25.0%
Further cash or basic food assistance	10	16.7%
Restoration of electricity, clean water and internet	8	13.3%
Restoration of agriculture, irrigation and land	5	8.3%
Equitable distribution and accuracy of aid targets	5	8.3%
Temporary job opportunities	5	8.3%

Source: Author Results (2026). One informant can convey more than one need.

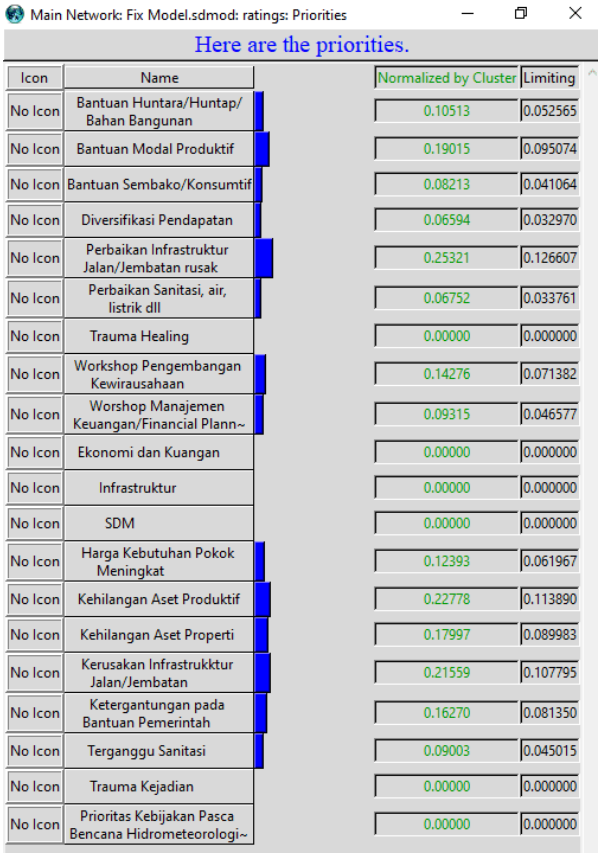
The results of the thematic analysis provide an overview of the nature of the economic impacts experienced by communities and the recovery needs that arise following a hydrometeorological disaster. The findings indicate that disruptions to mobility, damage to infrastructure, the loss of productive assets, a decline in business activity, and dependence on aid are interlinked in their impact on the process of economic recovery within communities. Following the thematic analysis, the identified recovery needs were further evaluated using the Analytic Network Process (ANP) through expert assessments to determine the priority weights of post-disaster economic recovery strategies, as presented in Figure 5 below.

The results of the priority analysis indicate that the main issue in the community's post-disaster economic recovery is the loss of productive assets, with a weighting of 0.22778, followed by damage to road and bridge infrastructure at 0.21559, the loss of property assets at 0.17997, and dependence on government aid at 0.16270. These findings indicate that disasters not only cause physical damage but also reduce communities' ability to maintain and reactivate their livelihoods. The loss of tools, business stock and means of production is further exacerbated by the disruption of transport links, which restricts labour mobility, the distribution of goods and communities' access to markets. Based on an assessment of policy alternatives, improvements to road and bridge infrastructure are the top priority with a weighting of 0.25321, followed by productive capital assistance at 0.19015 and entrepreneurship development workshops at 0.14276. These results indicate that post-disaster economic recovery must be carried out in a phased and integrated manner. Restoring access is a prerequisite for reactivating community mobility and economic activity, whilst productive capital assistance is required to replace or restore lost business assets. Furthermore, entrepreneurship development is necessary to strengthen the community's capacity to rebuild businesses and enhance their ability to adapt to future disaster risks. More detailed research findings can be found in Tables 5, 6 and 7.

The results of the unweighted supermatrix reveal the structure of the relationships and relative influences between nodes, illustrating the interdependencies among factor clusters, problems, and alternative solutions. After incorporating the cluster weights, the weighted supermatrix was obtained, indicating that infrastructure was the most influential factor (0.49339), followed by economic and financial factors (0.31081) and human resources (0.19580). The dominance of infrastructure reflects its essential role in supporting community economic activities, particularly by maintaining transportation accessibility, distribution networks, and access to workplaces and markets. Infrastructure disruption initiates a chain of economic consequences, beginning with damage to physical assets and transportation networks, followed by interruptions in mobility and distribution, declining production and business activities, and ultimately reduced employment opportunities and household income. These interconnected impacts explain why infrastructure recovery emerges as a critical prerequisite for restoring economic activities in disaster-affected communities.

The analysis of the limit supermatrix, which represents the stabilized priorities after accounting for interdependencies and feedback among elements, further identifies the principal challenges to post-disaster economic recovery. Within the problem cluster, the loss of productive assets received the highest global priority weight (0.11389), followed by damage to roads and bridges (0.10780), loss of property assets (0.08998), and dependence on government assistance (0.08135). These findings correspond to the three major problems highlighted in the infographic: loss of productive assets, infrastructure and mobility disruptions, and loss of livelihoods. The loss of productive assets directly reduces communities' ability to resume income-generating activities, while damaged transportation infrastructure restricts access to markets, raw materials, employment opportunities, and distribution channels. Consequently, infrastructure restoration and productive asset recovery should be considered complementary interventions rather than separate policy responses.

Within the alternative solutions cluster, road and bridge infrastructure improvements received the highest global priority weight (0.12661), followed by productive capital assistance (0.09507) and entrepreneurship development programs (0.07138). These priorities are reflected in the three policy interventions presented in the infographic. Infrastructure improvements focus on restoring roads, bridges, and economic accessibility to facilitate the mobility of people and goods. Productive capital assistance emphasizes business capital, replacement of working equipment, and recovery of productive assets to help affected communities resume economic activities. Meanwhile, entrepreneurship development programs focus on business mentoring, skills enhancement, and economic adaptation to strengthen the sustainability of community livelihoods.



Icon	Name	Normalized by Cluster	Limiting
No Icon	Bantuan Huntara/Huntap/ Bahan Bangunan	0.10513	0.052565
No Icon	Bantuan Modal Produktif	0.19015	0.095074
No Icon	Bantuan Sembako/Konsumtif	0.08213	0.041064
No Icon	Diversifikasi Pendapatan	0.06594	0.032970
No Icon	Perbaikan Infrastruktur Jalan/Jembatan rusak	0.25321	0.126607
No Icon	Perbaikan Sanitasi, air, listrik dll	0.06752	0.033761
No Icon	Trauma Healing	0.00000	0.000000
No Icon	Workshop Pengembangan Kewirausahaan	0.14276	0.071382
No Icon	Worshop Manajemen Keuangan/Financial Plann~	0.09315	0.046577
No Icon	Ekonomi dan Kuangan	0.00000	0.000000
No Icon	Infrastruktur	0.00000	0.000000
No Icon	SDM	0.00000	0.000000
No Icon	Harga Kebutuhan Pokok Meningkat	0.12393	0.061967
No Icon	Kehilangan Aset Produktif	0.22778	0.113890
No Icon	Kehilangan Aset Properti	0.17997	0.089983
No Icon	Kerusakan Infrastrukktur Jalan/Jembatan	0.21559	0.107795
No Icon	Ketergantungan pada Bantuan Pemerintah	0.16270	0.081350
No Icon	Terganggu Sanitasi	0.09003	0.045015
No Icon	Trauma Kejadian	0.00000	0.000000
No Icon	Prioritas Kebijakan Pasca Bencana Hidrometeorologi~	0.00000	0.000000

Figure 5. ***Results of ANP Priority with SuperDesicions***

Furthermore, the infographic organizes post-disaster economic recovery into four interconnected stages: emergency response, early recovery, livelihood restoration, and resilience strengthening. Emergency response focuses on meeting immediate needs and restoring essential services, while early recovery supports the gradual reactivation of economic activities. Livelihood restoration prioritizes the recovery of productive assets, employment, and business operations, whereas resilience strengthening emphasizes economic diversification, business adaptation, and preparedness for future disasters. These stages provide a practical framework for translating the ANP-based policy priorities into a phased recovery strategy. Importantly, the priorities derived from the ANP represent expert-based assessments of relative policy importance, whereas the thematic findings reflect the experiences and economic disruptions reported by disaster-affected communities. Integrating these two sources of evidence enables the proposed recovery strategies to respond to community needs while incorporating policy-level considerations regarding the interdependencies among recovery factors.

Based on these priorities, the findings of this study were subsequently presented in the form of an infographic as a more communicative and easily understandable medium for dissemination. The infographic was designed to concisely present the three main components of the analysis: the most influential factors, the key challenges faced by the community, and the priority alternative solutions for economic recovery following hydrometeorological disasters in West Sumatra. This visual presentation is intended to simplify the technical results of the ANP analysis into a more practical form of information, without compromising the substance of the research findings. Thus, the infographic serves not only to complement the presentation of the research results but also as a means of enhancing public understanding and supporting policy communication. Through the infographics, the public can gain a clearer picture of the direction of recovery that needs to be promoted, whilst local governments and other stakeholders can use them as an initial reference in formulating more targeted recovery programmes. In this context, the design of the infographics forms an important part of the effort to translate the research findings into more practical recommendations for the economic recovery of communities affected by disasters in West Sumatra.

Table 5. *Unweighted Supermatrix of Post-Hydrometeorological Disaster Policy Priority Model*

Cluster	Node	Temporary Shelter/Permanent Shelter/Building Materials Assistance	Productive Capital Assistance	Basic Necessities/Consumptive Assistance	Income Diversification	Road/Bridge Infrastructure Improvement	Sanitation, Water, and Electricity Improvement	Trauma Healing	Entrepreneurship Development Workshop	Financial Management Workshop	Economy and Finance	Infrastructure	Human Resources	Increased Prices of Basic Necessities	Loss of Productive Assets	Loss of Property Assets	Damage to Road/Bridge Infrastructure	Dependence on Government Assistance	Disrupted Sanitation	Disaster-Related Trauma	Policy Priorities for Post-Hydrometeorological Disaster Recovery in West Sumatra
Solution Alternatives	Temporary Shelter/Permanent Shelter/Building Materials Assistance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.00000	0.00000	0.58417	0.00000	0.00000	0.00000	0.00000	0.00000
	Productive Capital Assistance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.00000	0.36249	0.23183	0.00000	0.40478	0.00000	0.32030	0.00000
	Basic Necessities/Consumptive Assistance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.55843	0.00000	0.00000	0.00000	0.07942	0.00000	0.00000	0.00000
	Income Diversification	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.00000	0.13553	0.00000	0.00000	0.21556	0.00000	0.00000	0.00000
	Road/Bridge Infrastructure Improvement	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.12196	0.00000	0.00000	1,00000	0.00000	0.25000	0.00000	0.00000
	Sanitation, Water, and Electricity Improvement	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.00000	0.00000	0.00000	0.00000	0.00000	0.75000	0.00000	0.00000
	Trauma Healing	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.39189	0.00000
	Entrepreneurship Development Workshop	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.00000	0.26692	0.18400	0.00000	0.30025	0.00000	0.14391	0.00000
	Financial Management Workshop	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.11111	0.11111	0.11111	0.31962	0.23506	0.00000	0.00000	0.00000	0.00000	0.14391	0.00000
Factors	Economy and Finance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.31081
	Infrastructure	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.49339
	Human Resources	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.19580
Problems	Increased Prices of Basic Necessities	0.05805	0.06749	0.09422	0.14831	0.16269	0.05694	0.03870	0.20580	0.14019	0.04362	0.11104	0.09336	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Loss of Productive Assets	0.29654	0.39325	0.29700	0.28080	0.11221	0.19635	0.10506	0.17086	0.13804	0.18395	0.28557	0.18998	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Loss of Property Assets	0.35420	0.13462	0.17970	0.31462	0.11569	0.10120	0.15226	0.22863	0.13804	0.42229	0.20855	0.09884	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Damage to Road/Bridge Infrastructure	0.17983	0.28036	0.05171	0.03876	0.46935	0.07742	0.08993	0.05294	0.05305	0.20904	0.26494	0.14250	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Dependence on Government Assistance	0.06387	0.07240	0.20993	0.14985	0.08711	0.10922	0.24765	0.28961	0.47575	0.04979	0.03414	0.27699	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Disrupted Sanitation	0.04752	0.05188	0.16745	0.06767	0.05296	0.45887	0.00000	0.05215	0.05493	0.04775	0.04727	0.06086	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Disaster-Related Trauma	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.36641	0.00000	0.00000	0.04357	0.04851	0.13748	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Goal	Policy Priorities for Post-Hydrometeorological Disaster Recovery in West Sumatra	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Table 6. *Weighted Supermatrix of Post-Hydrometeorological Disaster Policy Priority Model*

Cluster	Node	Temporary Shelter/Permanent Shelter/Building Materials Assistance	Productive Capital Assistance	Basic Necessities/Consumptive Assistance	Income Diversification	Road/Bridge Infrastructure Improvement	Sanitation, Water, and Electricity Improvement	Trauma Healing	Entrepreneurship Development Workshop	Financial Management Workshop	Economy and Finance	Infrastructure	Human Resources	Increased Prices of Basic Necessities	Loss of Productive Assets	Loss of Property Assets	Damage to Road/Bridge Infrastructure	Dependence on Government Assistance	Disrupted Sanitation	Disaster-Related Trauma	Policy Priorities for Post-Hydrometeorological Disaster Recovery in West Sumatra
Solution Alternatives	Temporary Shelter/Permanent Shelter/Building Materials Assistance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.00000	0.00000	0.58417	0.00000	0.00000	0.00000	0.00000	0.00000
	Productive Capital Assistance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.00000	0.36249	0.23183	0.00000	0.40478	0.00000	0.32030	0.00000
	Basic Necessities/Consumptive Assistance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.55843	0.00000	0.00000	0.00000	0.07942	0.00000	0.00000	0.00000
	Income Diversification	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.00000	0.13553	0.00000	0.00000	0.21556	0.00000	0.00000	0.00000
	Road/Bridge Infrastructure Improvement	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.12196	0.00000	0.00000	1,00000	0.00000	0.25000	0.00000	0.00000
	Sanitation, Water, and Electricity Improvement	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.00000	0.00000	0.00000	0.00000	0.00000	0.75000	0.00000	0.00000
	Trauma Healing	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.39189	0.00000
	Entrepreneurship Development Workshop	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.00000	0.26692	0.18400	0.00000	0.30025	0.00000	0.14391	0.00000
	Financial Management Workshop	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.08333	0.08333	0.08333	0.31962	0.23506	0.00000	0.00000	0.00000	0.00000	0.14391	0.00000
Factors	Economy and Finance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.31081
	Infrastructure	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.49339
	Human Resources	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.19580
Problems	Increased Prices of Basic Necessities	0.05805	0.06749	0.09422	0.14831	0.16269	0.05694	0.03870	0.20580	0.14019	0.01090	0.02776	0.02334	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Loss of Productive Assets	0.29654	0.39325	0.29700	0.28080	0.11221	0.19635	0.10506	0.17086	0.13804	0.04599	0.07139	0.04749	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Loss of Property Assets	0.35420	0.13462	0.17970	0.31462	0.11569	0.10120	0.15226	0.22863	0.13804	0.10557	0.05214	0.02471	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Damage to Road/Bridge Infrastructure	0.17983	0.28036	0.05171	0.03876	0.46935	0.07742	0.08993	0.05294	0.05305	0.05226	0.06623	0.03562	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Dependence on Government Assistance	0.06387	0.07240	0.20993	0.14985	0.08711	0.10922	0.24765	0.28961	0.47575	0.01245	0.00853	0.06925	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Disrupted Sanitation	0.04752	0.05188	0.16745	0.06767	0.05296	0.45887	0.00000	0.05215	0.05493	0.01194	0.01182	0.01521	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Disaster-Related Trauma	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.36641	0.00000	0.00000	0.01089	0.01213	0.03437	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Goal	Policy Priorities for Post-Hydrometeorological Disaster Recovery in West Sumatra	**0.00000**	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Table 7. *Limit Supermatrix of the Post-Hydrometeorological Disaster Policy Priority Model*

Cluster	Node	Temporary Shelter/Permanent Shelter/Building Materials Assistance	Productive Capital Assistance	Basic Necessities/Consumptive Assistance	Income Diversification	Road/Bridge Infrastructure Improvement	Sanitation, Water, and Electricity Improvement	Trauma Healing	Entrepreneurship Development Workshop	Financial Management Workshop	Economy and Finance	Infrastructure	Human Resources	Increased Prices of Basic Necessities	Loss of Productive Assets	Loss of Property Assets	Damage to Road/Bridge Infrastructure	Dependence on Government Assistance	Disrupted Sanitation	Disaster-Related Trauma	Policy Priorities for Post-Hydrometeorological Disaster Recovery in West Sumatra
Solution Alternatives	Temporary Shelter/Permanent Shelter/Building Materials Assistance	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257	0.05257
	Productive Capital Assistance	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507	0.09507
	Basic Necessities/Consumptive Assistance	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106	0.04106
	Income Diversification	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297	0.03297
	Road/Bridge Infrastructure Improvement	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661	0.12661
	Sanitation, Water, and Electricity Improvement	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376	0.03376
	Trauma Healing	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Entrepreneurship Development Workshop	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138	0.07138
	Financial Management Workshop	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658	0.04658
Factors	Economy and Finance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Infrastructure	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Human Resources	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Problems	Increased Prices of Basic Necessities	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197	0.06197
	Loss of Productive Assets	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389	0.11389
	Loss of Property Assets	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998	0.08998
	Damage to Road/Bridge Infrastructure	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780	0.10780
	Dependence on Government Assistance	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135	0.08135
	Disrupted Sanitation	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502	0.04502
	Disaster-Related Trauma	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Goal	Policy Priorities for Post-Hydrometeorological Disaster Recovery in West Sumatra	**0.00000**	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000



Figure 6. *Infographic of Post-Disaster Economic Impacts and Priority Recovery Strategies in West Sumatra*

CONCLUSION

Thematic analysis results indicate that hydrometeorological disasters in West Sumatra have had economic impacts through the link between infrastructure damage, disruption of livelihood activities, and decreased community income. Power and water disruptions were experienced by 68.3% of informants, while road and bridge damage was reported by 33.3% of informants. These impacts then affected the continuity of economic activity, as reflected in 55% of informants experiencing a decrease or cessation of income. Traders, farmers and informal workers tend to be more vulnerable because their income depends on smooth access, the availability of production facilities, and the continuity of market activities. These qualitative findings are reinforced by the ANP results, which placed infrastructure as the most dominant factor, while loss of productive assets and road/bridge damage were high-priority issues. In the alternative solution cluster, road and bridge infrastructure repair was the top priority, followed by productive capital assistance and entrepreneurship development programs. Thus, post-disaster economic recovery in West Sumatra requires an approach that not only restores the physical condition of the region but also restores the community's capacity to work, produce, and earn income.

Local governments and relevant stakeholders need to develop recovery policies that integrate infrastructure rehabilitation with livelihood recovery. Repairs to roads, bridges, electricity, water, and supporting facilities should be carried out in parallel with the provision of productive capital assistance, replacement of work facilities, restoration of business premises, and entrepreneurship development programs tailored to the characteristics of the jobs and the level of vulnerability of the affected communities. Assistance should not be provided uniformly, but rather based on the needs of each livelihood group to ensure more targeted interventions and prevent increased dependence on government assistance. Furthermore, the research findings presented in infographic form can be used as a policy communication medium to help the public and stakeholders understand the key issues, priority management, and policy direction for post-hydrometeorological disaster economic recovery in West Sumatra.

DECLARATIONS

Use Of Artificial Intelligence

Data processing and analysis were independently conducted by the research team using Super Decisions software for the Analytic Network Process (ANP) analysis and Microsoft Excel. The interpretation of research findings was developed based on a critical review of academic books, scholarly journal articles, and empirical data obtained from the field. AI assistance, specifically Claude, was used to support the search for and identification of scientific references relevant to the research discussion. References recommended by AI were independently selected and re-verified by tracing the original publications to ensure the accuracy of bibliographic information, substantive consistency, and relevance to the research findings.

Author Contributions

Dian Fitriarni Sari — Served as the lead researcher, responsible for formulating the research concept and framework, developing the research benchmarks and model, and processing and analyzing data using the Analytic Network Process (ANP) and thematic analysis methods. In addition, she contributed to field data validation, interpretation of research findings, manuscript preparation, and critical review of the article's content and scientific quality.

Yasha Langitta Setiawan — Contributed to coordinating field data collection, managing research documentation, assisting with thematic analysis, identifying and collecting relevant scientific references, and preparing the manuscript. In addition, he was responsible for assisting with adjustments to the article's layout, structure, and formatting in accordance with the requirements of the target publication journal.

Rizky Alfadly — Contributed to supporting the development of visualizations of the analytical results. His contributions also included presenting research findings through graphs, diagrams, and other visual representations to clarify the interpretation and discussion of the research results.

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Conflict of Interest

All authors declare that they have no conflicts of interest, whether financial, personal, professional, or institutional, that could have influenced the research design, implementation, analysis, interpretation of findings, or publication of this study. All research activities and manuscript preparation were carried out independently, upholding the principles of objectivity, transparency, and academic integrity.

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