Resilience Development Initiative

Study Report

Financing Disaster Resilience in Indonesia: Assessing the Landscape and Charting Path Forward

Acknowledgement

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About Centre for Disaster Protection
The Centre for Disaster Protection works to find better ways to stop disasters from devastating lives by helping people, countries, and organisations change how they plan and pay for disasters.

About Resilience Development Initiative
Resilience Development Initiative (RDI) is dedicated to promote sustainable development and resilience-building efforts in communities facing challenges such as disasters, climate change, and social vulnerabilities.

About the 'Expanding and improving Disaster Risk Finance' grant
The Centre invited organisations to respond to a request for research proposals relating to questions around expanded and improved use of disaster risk finance (DRF) to strengthen resilience in developing countries

Disclaimer
This publication reflects the views of the authors and not necessarily the views of the Centre for Disaster Protection.

Acronyms

AAUI - Indonesian General Insurance Association

ABMN - State-Owned Assets Management

ADB - Asian Development Bank

APBD – Sub-National State Budget

APBN – State Budget

APPIK - Fisheries Insurance for Small Fish Farmers

ASP - Adaptive Social Protection

AUTP - Rice Farming Business Insurance

AUTSK - Cattle / Buffalo Business Insurance

AYII - Area Yield Index Insurance

BA BUN - National Enterprise Budget Agency

BNPB – National Disaster Management

BPAN - Assistance with Fishermen's Insurance Premiums

BPBD – Regional Disaster Management Agency

BPJS – Social Security Administration Agency

BTT – Unexpected Expenditure

COVID-19 - Corona Virus Disease 2019

DDSS - Dynamic Decision Support System

DIPA – List of Budget Implementation Items

DPPP - Directorate of Non-Bank Financial Industry Supervision

DRF - Disaster Risk Finance

DRFI - Disaster Risk Financing and Insurance

DRR - Disaster Risk Reduction

DSP – On-Call Fund (Dana Siap Pakai)

GDP - Gross Domestic Product

GFDRR - Global Facility for Disaster Reduction and Recovery

GIS - Geographical Information System

IRBI – Indonesia's Disaster Risk Index

JHT – Old Age Security

JKK – Work Accident Security

JKM – Life's Insurance

JKP – Job Loss Security

JP – Retirement Security

MSME - Micro, Small, and Medium Enterprises

NGO - Non-Government Organisation

NTB - West Nusa Tenggara

OFDA - Office of Foreign Disaster Assistance

OJK – Financial Services Authorities

OPD - Local Government Organization

IDR - Indonesian Rupiah

PDNA - Post-Disaster Needs Assessment

PEN – National Economic Recovery Program

PRA - Probabilistic Risk Assessment

RKA – Budget Workplan

RNPB - National Disaster Management Plan

RPBD – Local Disaster Management Plan

RPJMD - Local Medium-Term Development Plan

RR - Rehabilitation and Reconstruction

SEOJK - Financial Services Authority's Regulation

IMF - International Monetary Fund

SOB - Dutch Colonial Period Emergency Law

SOE - State-Owned Enterprise

SPM - Minimum Service Standards

JICA - Japan International Cooperation Agency

UN - United Nations

UNDP - United Nations Development Programme)

US - United States

USAID - United States Agency for International Development

USD - United States Dollar

WASH - Water, Sanitation, and Hygiene

WB - World Bank Group

Executive Summary

As one of the most disaster-prone countries globally, Indonesia faces significant challenges in financing disaster resilience. Despite substantial progress, the current financial mechanisms remain insufficient to cover the extensive economic losses from disasters. This document, prepared by the Resilience Development Initiative (RDI) with financial support from the Centre for Disaster Protection (CDP), outlines Indonesia's existing disaster risk finance (DRF) mechanism—strategies that help countries access funds quickly after a disaster to support recovery—identifies key constraints, and provides actionable recommendations for improvement.

The need for a comprehensive Disaster Risk Financing and Insurance (DRFI) Strategy in Indonesia became apparent after major disasters such as the 2018 earthquakes in Central Sulawesi and Lombok. Government funds allocated for disaster response, which ranged from USD90 million to USD750 million between 2014 and 2018, proved vastly inadequate compared to the actual losses incurred. In response, Indonesia has implemented various measures, including contingent credit lines, on-call funds, state-owned assets insurance, and the Disaster Pooling Fund. However, challenges persist, such as low market demand among micro, small, and medium enterprises (MSMEs) and structural issues stemming from low GDP per capita.

This study aims to identify key constraints to DRF implementation, analyse the political economy and power dynamics shaping DRF implementation, and develop recommendations to address these constraints.

Several strategic issues have been identified concerning the implementation of Disaster Risk Financing and Insurance (DRF) in Indonesia. The identified strategic issues are as follows:

1. **Regulation Updates for Disaster Management Financing:**

   The achievements of the DRFI Strategy and future implementation efforts necessitate updates to several regulations governing disaster management financing. Key regulations requiring revision include Law No. 24 of 2007, Government Regulations No. 21 and 22 of 2008, and other relevant regulations to ensure the inclusion of the current and future DRFI Strategy and the government's latest risk finance mechanism. Additionally, revisions to include the updated roles of key stakeholders, such as Local Government and Private Sector, are necessary to improve the implementation of disaster risk finance in Indonesia.

2. **Coordination and Synergy in Policy Making within the government and private sector:**

   The current coordination scheme is not yet clear for formulating efficient disaster risk finance policies, as existing interventions tend to overlap.

3. **Integration of Risk Analysis and Metrics with DRF:**

   Current disaster risk analysis and metrics have yet to integrate DRF. Disaster-related indices such as the Indonesia Disaster Risk Index (Indeks Risiko Bencana Indonesia/IRBI) and its derivatives have not yet captured the impact of DRF

implementation on disaster management. The National Disaster Management Authority (Badan Nasional Penanggulangan Bencana/BNPB) is in the process of updating IRBI to include aspects of disaster financing, such as disaster expenditure, insurance utilisation, and other risk reduction investments.

4. Disaster-based Fiscal Projections:

Disaster-based fiscal projections are not yet feasible or integrated into development planning due to the non-probabilistic nature of current risk analysis. While BNPB's RBI studies can estimate maximum disaster losses, this information is not yet usable for prioritising disaster risk reduction investments or preparing fiscal reserves for disasters.

5. Development of Micro Disaster Insurance:

Current micro disaster insurance products are limited to those developed based on the 2013 Grand Design for Micro Insurance Development, and private sector providers of climate insurance products need support for product development. This can be supported through research and development funding or policy incentives, enabling the development of more climate insurance products. Given the limited purchasing capacity and preference (based on per capita income), awareness, and practicality preference of SMEs and lower-middle-income groups, further development of microinsurance in Indonesia is necessary.

6. Detailed Implementation of Mandatory Disaster Insurance:

There is a need for further details regarding mandatory disaster insurance mandated in the Financial Sector Development and Strengthening Law. There is confusion regarding how the implementation of the mandatory disaster insurance mandate would be. However, the mandate opens opportunities for broader insurance and protection development against disaster risks. Therefore, the implementation of Disaster Insurance requires technical regulations in detailing the way how mandatory disaster insurance works.

7. Evaluation of Government-Initiated Climate Insurance:

Government-initiated climate insurance programs need to be evaluated in terms of rates, design, and targeting of beneficiaries and gradually phased out of the subsidy scheme. The coverage of these programs is limited and depends on government fiscal capacity. The loss ratio indicates adverse selection among policyholders who are more prone to disasters. Additionally, public awareness of the need to voluntarily utilise insurance is limited because of low literacy and the tendency to participate if there is a subsidy.

8. Integration of Adaptive Social Protection with DRF:

Adaptive Social Protection (ASP) has yet to integrate DRF, especially in ensuring rapid and adequate financing. With social protection reform through ASP expected to materialise, supportive financing strategies are needed—particularly responsive, sufficient, and sustainable financing. How DRF supports ASP still needs to be regulated and detailed. Interviews revealed that contingency instruments like On-Call Fund (Dana Siap Pakai/DSP) do not support emergency social assistance programs, sometimes leading to delays in fund disbursement.

Recommendations for Developing Indonesia's DRFI Strategy

Study findings enable the formulation of several recommendations for improving the DRFI Strategy going forward. The recommendations are as follows:

1. Revising Regulations Related to Disaster Management Financing. These revisions are essential to incorporate the current Disaster Risk Financing and Insurance (DRF) Strategy and the Government's future DRF Roadmap, update the role of key stakeholders along with the latest risk financing mechanisms, such as the Disaster Pooling Fund:

Several regulations and sections that need revision or updates include:

- Law No. 24 of 2007 on Disaster Management;
- Government Regulation No. 21 of 2008 on Disaster Management Implementation;
- Government Regulation No. 22 of 2008 on Disaster Relief Funding and Management;
- Government Regulation No. 12 of 2019 on Regional Financial Management;
- Minister of Home Affairs Regulation No. 77 of 2020 on Technical Guidelines for Regional Financial Management;
- Minister of Finance Regulation No. 105/PMK.05/2013 on Disaster Management Budget Implementation Mechanism and Regulation No. 173/PMK.05/2019 on Amendments to Regulation No. 105/PMK.05/2013;
- Minister of Finance Regulation No. 29 of 2024 on Post-Disaster Rehabilitation and Reconstruction Grant Management; and
- BNPB Regulation No. 1 of 2024 on Fund Disbursement Review, Verification, and Evaluation.

2. Improving Disaster Management Metrics and Indices:

Review the components of IRBI and supporting indices to include DRF indicators, such as the utilisation of State-owned Property Insurance (Asuransi Barang Milik Negara/ABMN), availability and utilisation mechanisms of Unexpected Expenditure (Biaya Tak Terduga/BTT) for disasters, regional disaster expenditure, insurance utilisation, social protection coverage, and regional fiscal capacity.

3. Developing Probabilistic Risk Analysis and Fiscal Projections:

Steps for further developing national risk analysis methods include:

- Formulating probabilistic risk analysis methodology and setting data standards.
- Analysing disaster losses and impacts considering loss realisation probabilities.
- Studying emergency fiscal needs at the national level
- Preparing guidelines and supporting regulations for local governments.
- Facilitating training on probabilistic risk calculations and regional emergency fiscal needs.

4. Developing Market-Based Micro and Climate Insurance Products:

Evaluate and adjust climate insurance products regarding premium prices, subsidy reduction plans, and bundling with sector-specific credit. The aim is to support climate-smart agriculture and encourage policyholders' risk reduction efforts.

5. Formulating Detailed Regulations for Mandatory Disaster Insurance:

Detailed implementation of mandatory disaster insurance as mandated by the Financial Sector Development and Strengthening Law, including:

- Determining criteria for groups required to have disaster risk home insurance.
- Estimating program funding needs and potential funding scenarios.
- Piloting mandatory disaster risk home insurance in specific areas.
- Gradual implementation of mandatory disaster risk property insurance for all required groups.

6. Evaluating and Scaling Up Climate Insurance Products:

Evaluate and adjust climate insurance products regarding premium prices, subsidy reduction plans, and bundling with sector-specific credit. The aim is to support climate-smart agriculture and encourage policyholders' risk reduction efforts.

7. Supporting ASP with Appropriate DRF Mechanisms:

Strengthen regulations related to On-Call Fund (Dana Siap Pakai/DSP) and Disaster Pooling Fund (DPF) to support emergency social assistance funding. Steps include:

- Strengthening regulations for using BTT and village funds for emergency social assistance.
- There is a need to develop studies on building an effective mechanism in expanding social insurance mechanisms (BPJS Ketenagakerjaan and BPJS Kesehatan) in times of Disaster to understand a more practical case study in the integration of comprehensive DRF landscape with ASP.

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1. Introduction

1.1 Background

Since 2018, increasing recognition of Disaster Risk Financing and Insurance (DRF) as essential for addressing funding gaps after major disasters has emerged in Indonesia. Major disasters like the 2004 Indian Ocean tsunami and earthquakes in Central Sulawesi (2018) and Lombok (2018) highlighted the inadequacy of post-disaster allocations alone. Despite government funds ranging from USD 90 million to USD 750 million from 2014 to 2018, these were insufficient compared to actual losses (Ministry of Finance, 2018). Only a fraction of losses was insured, emphasising the need for a comprehensive DRF Strategy.

Over the past decade, the government has introduced a range of measures, beginning with on-call funds in 2008, followed by mechanisms such as state-owned asset insurance and the Disaster Pooling Fund from 2018 onward. Subsidised insurance schemes for agriculture and microenterprises have been introduced. However, challenges persist, such as low market demand, especially among MSMEs, and structural issues due to low GDP per capita.

Public financial management (PFM) challenges include inadequate pre-disaster financing and delayed disaster-related social assistance. DRF and social protection need to be linked more effectively, especially with the ongoing development of Adaptive Social Protection (ASP).

Looking ahead to 2025, there is an opportunity to refine the DRFI Strategy based on ongoing implementation and research. Despite challenges, Indonesia has made substantial progress, gained international recognition and formed partnerships with insurance companies. Other Southeast Asian and South Asian countries are lagging in adopting similar approaches.

Indonesia's comprehensive approach to disaster risk management, integrating insurance with various financing schemes, provides valuable lessons for other developing countries. By prioritising partnerships and financial integration, Indonesia aims to enhance resilience and reduce socio-economic impacts from disasters.

1.2 Study's Objective and Scope

Based on background, the study's key objectives are as follows:

Identify key constraints to DRF implementation in Indonesia;

Analyse key actors and their power dynamics in shaping DRF implementation; and

Develop actionable recommendations to address the identified constraints, including those related to political economy factors.

To achieve the aforementioned study's objectives, this study will focus on the discussion of several key aspects:

- Indonesia's Disaster Risk Finance (DRF) journey: This analysis will uncover milestones achieved and identify areas for improvement.
- Political economy dynamics: The study will examine power structures to identify potential roadblocks and opportunities for DRF development.

- Disaster Risk Finance (DRF) effectiveness: A comprehensive evaluation will assess the performance of both public and private instruments.
- Disaster Risk Finance Implication: The study will explore the effects and implications of DRF on disaster preparedness and recovery.
- Strengthening DRF: The analysis will identify challenges and opportunities to enhance Indonesia's DRF approach.

1.3 Study's Methodology

The study on DRF in Indonesia will employ a comprehensive approach to data collection, utilising both qualitative and quantitative methods. Qualitative approaches such as desk and literature reviews, key-informant interviews, and survey data will be conducted, supplemented by quantitative data gathered through desk reviews of government documents, surveys, and secondary statistical results from credible sources.

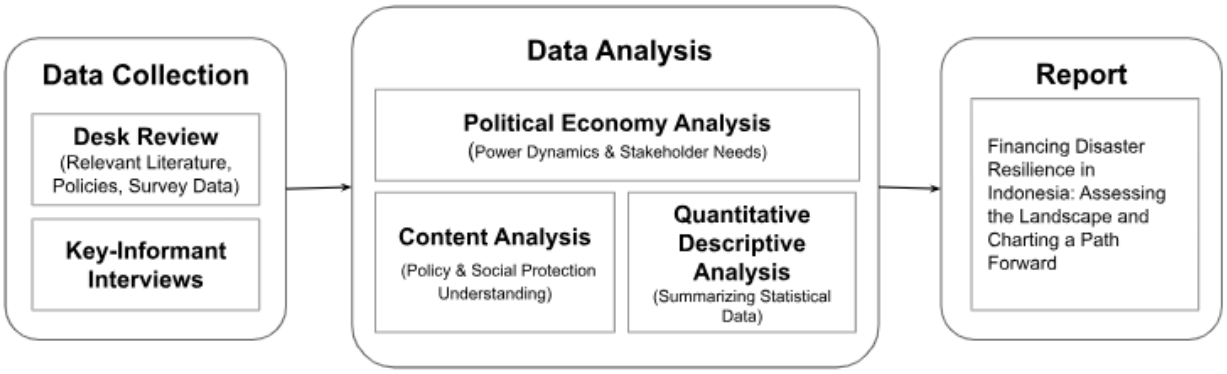

Figure 1. Methodology Framework
Source: Authors, 2024

Data analysis is multifaceted, encompassing both qualitative and quantitative techniques. Content analysis will aid in understanding existing policies in disaster risk finance. Quantitative descriptive analysis is utilised to interpret secondary statistical data, presenting it in accessible formats such as figures and tabulations. Meanwhile, Political Economy Analysis (PEA) provides insights into power dynamics and competing interests shaping DRF in Indonesia, guiding the development of politically feasible strategies that address the needs of all stakeholders.

Several tools are also employed to facilitate analysis and strategy development. Stakeholder Mapping and inter-organisational network analysis can reveal connections between actors involved in DRF implementation. At the same time, Capacity Gap Assessment identifies disparities between objectives and the actual or potential abilities to achieve them, highlighting key areas where development strategies may fall short. Lastly, Triangulation of Data will ensure the validity and robustness of findings by cross-referencing information collected through various methodologies, including desk reviews, in-depth interviews, and focus group discussions.

2. Risk Financing Governance in Indonesia:

Context, Political Economy, and Power Dynamics

2.1 Understanding the Context of Disaster Risk Finance in Indonesia

Indonesia, ranked as the second most disaster-prone country globally (World Risk Report, 2023), is situated within the Pacific Ring of Fire, making it highly susceptible to various natural hazards. Earthquakes, volcanic eruptions, tsunamis, floods, and landslides frequently strike the archipelago. Data from BNPB **(Figure 2)** highlights the prevalence of floods and landslides over the past decade. Nearly the entire population of Indonesia, over 270 million people, reside in disaster-prone areas, with 90 per cent of them directly exposed to these hazards. In 2023, an estimated 258 million people were at risk, with the highest concentration in West Java, where approximately 193 million people were exposed (BNPB, 2023). Additionally, socio-economic and demographic factors such as age, gender, income, economic circumstances, and knowledge levels further influence disaster risk (Wisner et al., 2004).

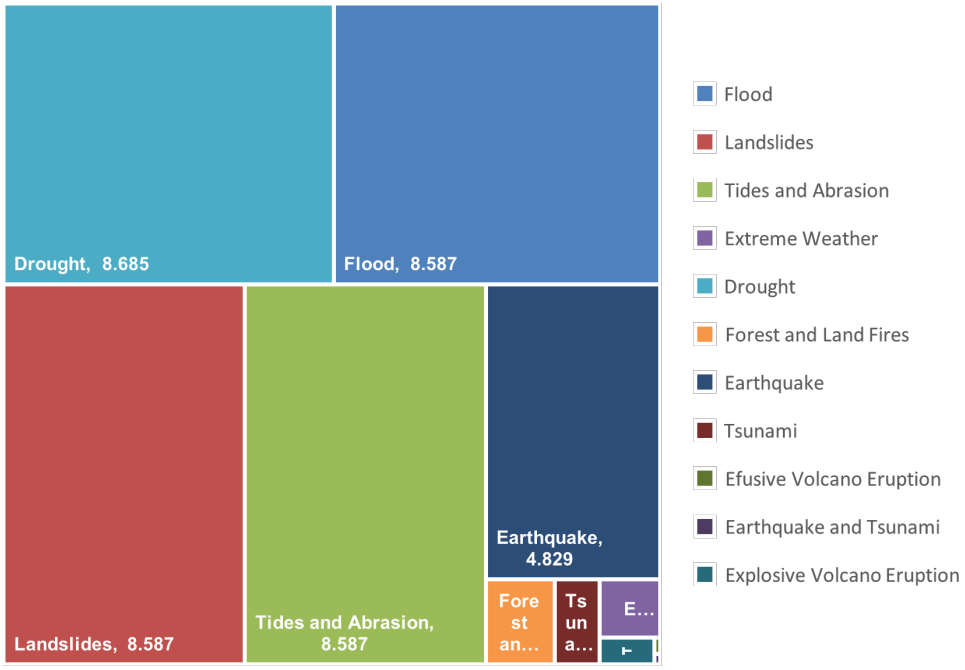

Figure 2. Disaster Prevalence in Indonesia

Source: BNPB, 2024

Indonesia, with a population of approximately 281 million, has made progress in reducing poverty since the peak of the COVID-19 pandemic, with the poverty rate declining to 9.03 per cent from 10.19 per cent in 2020 (BPS, 2021). Income inequality, as measured by the Gini coefficient, improved to 0.379 in March 2024 (BPS, 2025). Despite these trends, significant disparities remain across income levels, age groups, and genders, with pronounced differences between provinces, urban, and rural areas **(Figure 3).**

Indonesia's disaster management policy has evolved from a focus on war emergencies during the Colonial Period, as seen with the Dutch SOB 1939 law, to addressing disasters post-independence. Significant milestones include the establishment of a national disaster management structure in the 1980s and the increased focus on natural and human-made disasters in the 1990s, highlighted by the 1992 Flores disaster. The early 2000s saw a move towards disaster risk reduction and governance, integrating civil society and regional cooperation (Lassa, 2013). Following the COVID-19 pandemic, a revolution in disaster policy in 2020 digitised planning and evaluation processes, helping Indonesia manage biological disasters.

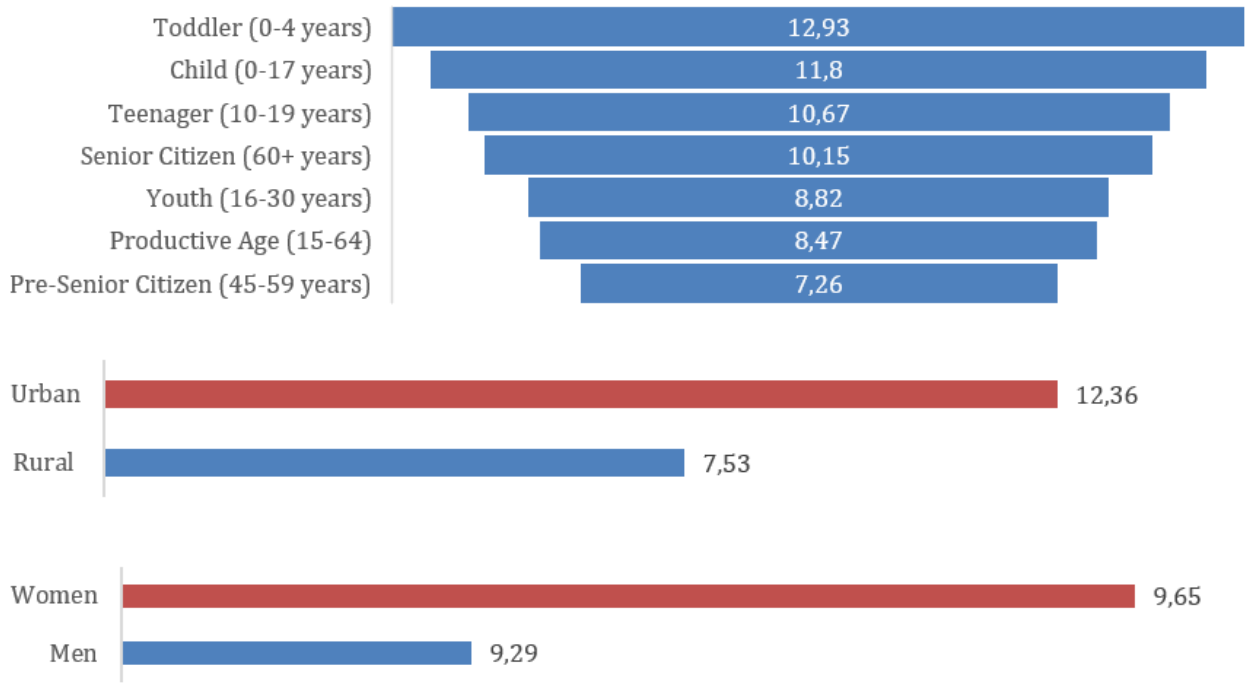

Figure 3. Poverty Index by Age Group, Area and Gender
Source: BNPB, 2024

Moreover, Indonesia's vulnerability to disasters has driven significant advancements in its disaster management system. The 2007 Disaster Management Law introduced a dual governance structure involving central and local authorities. The National Disaster Management Agency (Badan Nasional Penanggulangan Bencana/BNPB) was established at the national level. At the same time, Regional Disaster Management Agencies (Badan Penanggulangan Bencana Daerah/BPBD) were formed at the provincial and municipal levels. The central government formulates national policies, allocates resources, and coordinates disaster response efforts, including data management and capacity building for local governments. Local authorities develop tailored disaster management plans, engage communities, and implement early warning systems (Putra & Matsuyuki, 2019). Despite these advancements, challenges persist, such as insufficient funding at the local level and weak coordination between central and local government bodies, which hinder disaster response efforts.

Economically, Indonesia's economy is projected to grow by 5.2 per cent in 2024, driven

by domestic consumption and investment. As Southeast Asia's largest economy, it contributes 2.54 per cent to global GDP. However, the country faces challenges, including a 5.2 per cent unemployment rate, a -0.9 per cent current account balance as a percentage of GDP, and a government debt burden of 39.3 per cent (IMF Data Mapper, 2024). Catastrophic disasters like the 2004 Aceh tsunami, the 2006 Yogyakarta earthquake, and the 2018 Sulawesi earthquake and tsunami have inflicted substantial economic damage, far exceeding the government's disaster relief fund. A 2021 risk assessment by BNPB revealed a potential economic loss of IDR 934 trillion (USD 65,5 billion at an exchange rate of IDR 14,245) due to disasters, equivalent to 33 per cent of the country's GDP, with extreme weather events posing the most significant economic threat, followed by earthquakes **(Figure 4).**

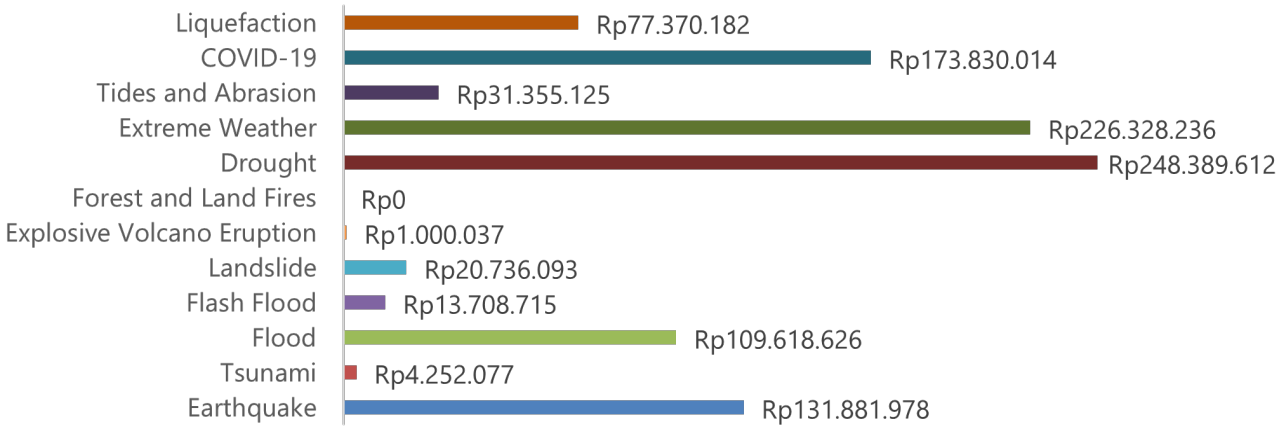

Figure 4. Disaster Type and Number of People Exposed
Source: BNPB, 2024

Social and cultural factors significantly influence disaster management in a country known for its diverse culture. Grassroots organisations played a crucial role in the aftermath of the Merapi volcano eruption, highlighting the importance of social capital and information sharing in disaster response (Ayuningtyas et al., 2021). Conversely, the Aceh tsunami revealed a knowledge gap among community members, emphasising the need for effective education and awareness campaigns. Technological integration is evident in developing the Geographical Information System - Social Media - Dynamic Decision Support System (GIS-SM-DDSS) for tsunami risk mitigation in Padang, demonstrating the potential to enhance early warning systems and evacuation planning. However, successful implementation requires strong community engagement and understanding. Local wisdom and practices, such as the Mentawai people's use of *'tuddukat'* drums and the Minangkabau people's granaries, offer valuable lessons in disaster management.

2.2 Unpacking the Power Dynamics: A Political Economy Analysis of Indonesia's Disaster Risk Finance

Indonesia's disaster risk finance policy is guided by a comprehensive set of regulations and strategic frameworks, primarily rooted in Law No. 24 of 2007 on Disaster Management. This law emphasises Disaster Risk Reduction (DRR) and established the National Disaster Management Agency (BNPB) as the central authority for DRR and

disaster response. The regulatory framework includes Law No. 25 of 2004 regarding the National Development Planning System, Government Regulation No. 21 of 2008 on Disaster Management Implementation, and Presidential Regulation No. 1 of 2019 regarding BNPB.

Primary funding for disaster management comes from the state budget (APBN) and regional budgets (APBD), which align with the National Disaster Management Plan (RNPB) and Regional Disaster Management Plans (RPBD). On-call funds managed by BNPB are available for various disaster management phases, governed by Government Regulation No. 22 of 2008 and Ministry of Finance Regulation No. 173/PMK.05/2019. As an alternative funding source, BNPB Regulation No. 17 of 2010 highlights insurance, with mechanisms promoted by Law No. 40 of 2014 and the 2018-2023 Disaster Risk Financing and Insurance (Pembiayaan dan Asuransi Risiko Bencana/PARB) Strategy. Pre-disaster funding focuses on prevention and resilience-building, while emergency response financing involves APBN and APBD allocations, on-call funds, and emergency funds through BNPB. Post-disaster activities are funded by various sources, with procedures outlined in BNPB Regulations No. 17 of 2010 and No. 6 of 2017. Despite this comprehensive framework, the lack of emphasis on insurance in laws and regulations hampers post-disaster recovery and financial resilience, placing a greater burden on the government and slowing down recovery efforts (Thorieq, 2023).

Key institutions support Indonesia's disaster risk finance policy by formulating, implementing, and coordinating disaster management and funding strategies. These institutions operate under a regulatory framework to enhance the country's disaster resilience and ensure effective disaster risk reduction, response, and recovery.

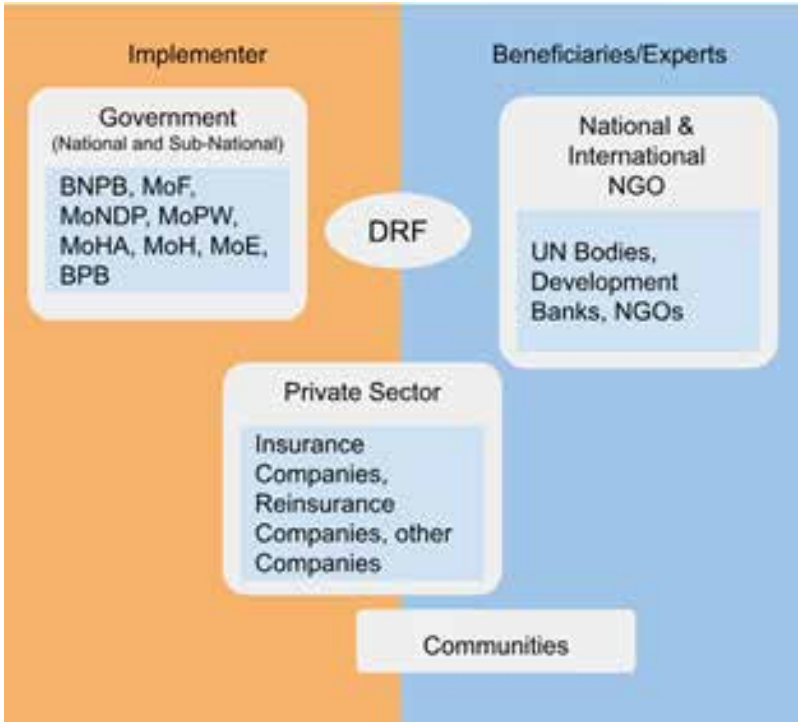

Figure 5. Key Stakeholders in Indonesia's DRF
Source: Authors, 2024

The National Disaster Management Agency (*Badan Nasional Penanggulangan Bencana*/BNPB) is central to Indonesia's disaster management efforts, formulating norms, standards, procedures, criteria, and licensing requirements for disaster management. BNPB receives annual funding from the state budget (*Anggaran Pendapatan dan Belanja Negara*/APBN) and manages On-Call Funds (*Dana Siap Pakai*/DSP) for emergency responses, though the Ministry of Finance controls these funds. BNPB's involvement extends to post-disaster activities, including direct community assistance and grant-funded social aid as regulated by Ministry of Finance Regulation No. 105/2013.

The Ministry of Finance is key in formulating and implementing budgeting, treasury, and financial balancing policies, including disaster management financing. It allocates funds for disaster management programs conducted by relevant ministries, local governments, or community groups. The Ministry of National Development Planning (MoNDP) coordinates formulating policies related to planning and national development strategy, including disaster management. The Ministry of Public Works and Housing focuses on reconstructing buildings, housing, and infrastructure affected by disasters. The Ministry of Social Affairs manages social protection and rehabilitation in disaster-affected areas, providing logistics, refugee support, and social services. The Ministry of Health provides emergency health response and addresses health issues in evacuation areas. The Ministry of Education and Culture integrates disaster mitigation education into the school curriculum. The Ministry of Energy and Mineral Resources conducts research and socialisation for geological disaster mitigation. The Ministry of Home Affairs coordinates national and regional disaster management efforts. The Financial Services Authority regulates and supervises the financial sector, offering flexibility to banks affected by disasters.

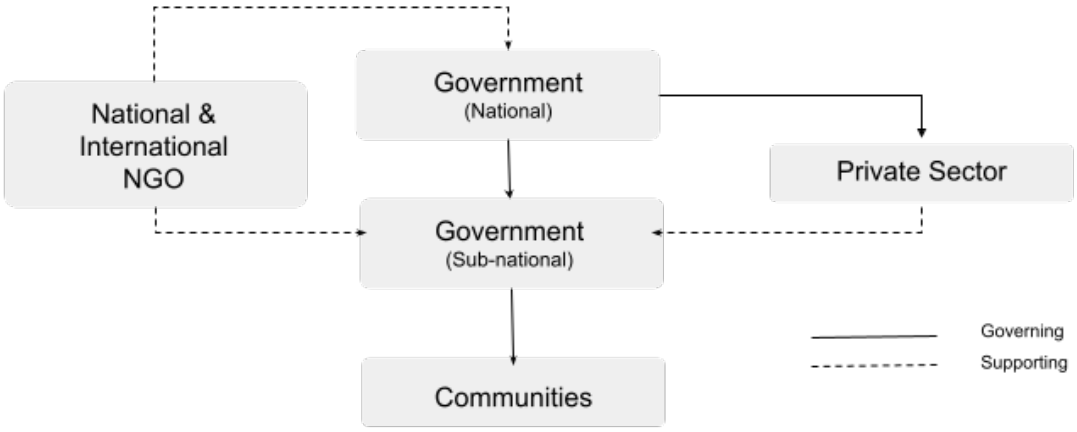

Figure 6. Power Dynamics in Indonesia's DRF

Source: Authors, 2024

At the regional level, Regional Disaster Management Agencies (Badan Penanggulangan Bencana Daerah/BPBD) are responsible for formulating and implementing regional disaster management policies, ensuring rapid and efficient disaster responses, and coordinating disaster management activities. BPBDs are funded by regional budgets (Anggaran Pendapatan dan Belanja Daerah/APBD) and work closely with local governments. BPBDs coordinate with the central government in large-scale disasters and implement necessary actions upon receiving aid.

Private sector insurance companies play a strategic role in transferring risks through various insurance products available in the market. State-owned Jasindo provides subsidised insurance, while financial institutions like Bank Central Asia, Mandiri or AXA Group offer unsubsidised insurance. However, issues such as moral hazard and the affordability of premiums affect the sustainability and accessibility of these insurance products. Companies outside the insurance sector often contribute through donations in times of emergency, though these efforts are sometimes uncoordinated.

Communities are both implementers and beneficiaries of disaster risk finance, buying insurance premiums and gaining payouts if affected by disasters. However, insurance utilisation remains low for residential areas, reflecting a lack of urgency in disaster risk perception. Nonetheless, Indonesian communities are generous in donations and often organise initiatives to support affected populations.

National non-governmental actors, including research centres, academicians, and civil society organisations, contribute to accumulating knowledge through data, research, and grassroots initiatives. International NGOs and agencies like the United Nations, Asian Development Bank, and World Bank focus on public finance management of disaster and optimising disaster insurance in Indonesia.

Despite the robust framework, coordinating policies and efforts across different government levels and between the government and private sectors is challenging. Private sector participation in disaster management is shaped by local factors, such as the activity level of regional disaster agencies (BPBD), business scale, and local disaster vulnerability. High-risk areas tend to attract more support from the private sector, while lower-risk areas often receive minimal engagement. Additionally, implementation and coordination remain fragmented, often functioning in silos. There are cases of overlapping responsibilities across agencies—such as those outlined for the BNPB under Presidential Regulation No. 8 of 2008—that create inefficiencies that hinder cohesive disaster management efforts. Additionally, while regulations like Law No. 40 of 2014 and BNPB Head Regulation No. 12 of 2014 promote private sector engagement, fiscal incentives are limited mainly to tax breaks in national disaster responses, thereby constraining private investment in proactive risk reduction.

The private sector also underutilises risk transfer mechanisms. Current regulations predominantly address traditional insurance products, with little emphasis on innovative tools like catastrophe bonds or parametric insurance that could significantly enhance disaster risk financing. Effective disaster risk financing and insurance also depend on robust data and risk assessment tools, which are currently inadequate. Strengthening SEOJK and PMK regulations to mandate data transparency and risk modelling would enhance disaster risk management. Furthermore, while BNPB Head Regulation No. 12 of 2014 provides detailed guidelines for private sector involvement, optimal utilisation remains limited, and comprehensive data on private sector contributions is still lacking. Improved documentation, monitoring, and coordination are essential for transparency, accountability, and effective public-private collaboration in disaster response. These gaps are also prevalent in terms of sharing risk data and lessons learned that can support these stakeholders, which is crucial for effectively achieving disaster risk finance goals.

3. Disaster Risk Finance Mechanism in Practice

3.1 Indonesia's Disaster Risk Finance Landscape

Disaster risk financing schemes are essential to ensure adequate resources for both preventative measures and emergency response. Disasters, often unpredictable, are prevalent globally and necessitate sustainable, multidimensional risk management strategies. These events impact not only individuals or specific communities but also have extensive effects across various sectors, including health, the economy, and the environment. Therefore, financing disaster risk management is imperative to mitigate potential risks effectively. This involves continuous, multidimensional processes that demand sustained attention, effort, and resources.

As the dynamics of our times evolve, human activities increasingly influence climate change vulnerability, contributing to the frequency and intensity of disasters worldwide. These disasters' complexity and extensive impact underscore the necessity for specialised and focused policy frameworks for disaster mitigation. While existing financial systems can be leveraged for humanitarian and crisis funding, developing more specialised financial schemes is crucial to enhancing the effectiveness of such funding. These approaches ensure targeted and efficient responses to complex challenges, providing a robust foundation for rapid disaster response. Policymakers have developed the DRF framework to address these challenges.

The government of Indonesia has strategically enhanced disaster resilience by implementing the DRFI Strategy (Ministry of Finance, 2018) . Central to Indonesia's efforts to strengthen its resilience against frequent disasters, the DRFI Strategy aims to provide financial protection against disaster-related losses and fortify community and infrastructure resilience. The government has launched various DRF initiatives, including subsidised disaster insurance for vulnerable communities and insurance schemes that leverage advanced technologies like weather and loss indices. Furthermore, partnerships between the government, the private sector, and international financial institutions have broadened the accessibility of DRFs nationwide. Despite ongoing challenges in implementation and achieving wider penetration, the prioritisation of DRF initiatives remains steadfast, ensuring that Indonesia is better equipped to mitigate the impacts of disasters and accelerate post-disaster recovery processes more effectively.

The funding strategy for disaster risk management is intrinsically linked to disaster risk layering. This sophisticated method categorises disaster financing instruments according to the frequency and impact of disasters into low, medium, and high-risk layers (Ministry of Finance, 2018). This meticulous classification ensures that the financing instruments implemented are precise and efficient, considering the

country's limited fiscal capacity, the varying levels of disaster risk, and the diverse socio-economic conditions of the affected communities. The layering principle also necessitates multiple disaster financing instruments tailored to different disaster categories (see **Figure 7**).

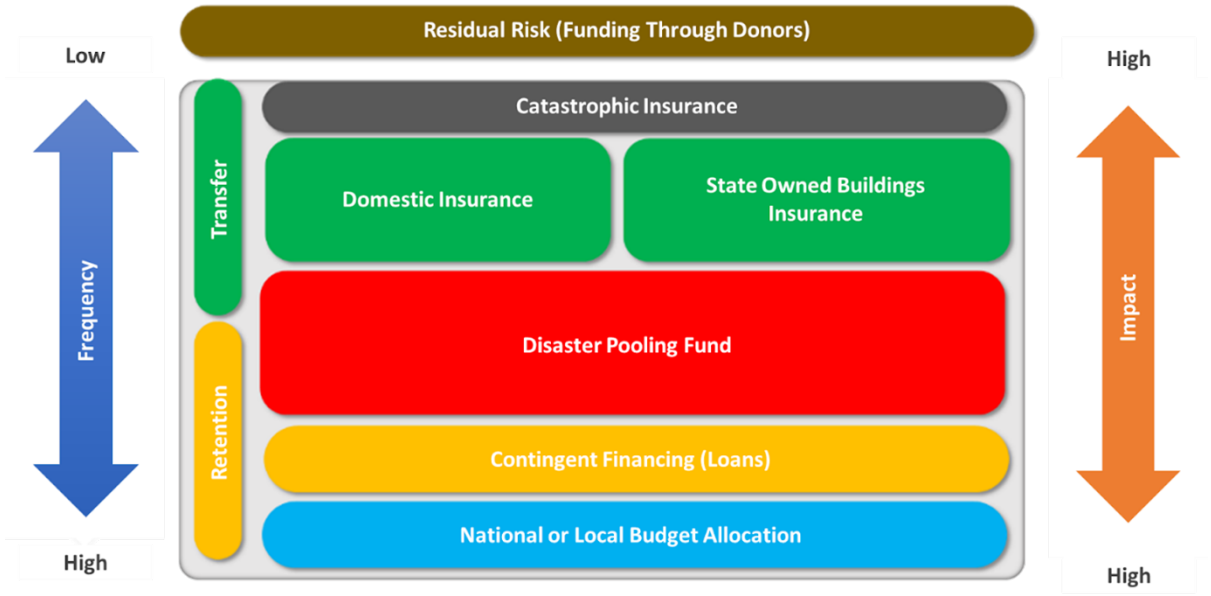

Figure 7. Indonesia's DRFI Strategy
Source: Ministry of Finance, 2018

The DRF strategies are dichotomised into two primary categories. The first category encompasses financing retained by the government through sources such as the state regional budget, pooled funds, and contingent loans. This retention strategy ensures that immediate and accessible funds are available to address disaster impacts directly. The second category involves the transfer of risk to third parties through sophisticated insurance schemes. This approach includes provisions for external assistance, particularly vital when a disaster occurs on an exceptionally large scale, known as residual risk.

The layering approach is meticulously designed to identify the most appropriate and efficient financing instruments based on risk classification, ensuring that the chosen instruments align with the specific risk, whether retained or transferred. This approach is critically important in the Indonesian context as it also considers the nation's constrained fiscal capacity, the geographic and demographic distribution of disaster risks, and the varied socio-economic conditions prevalent in its communities (Ministry of Finance, 2018).

The priority of the disaster risk financing strategy starts with the state and regional budgets, ensuring the protection of all public assets to maintain the continuity of public services after a disaster. Financing for state asset protection is implemented through three main schemes: the government bears financing through APBN/APBD, pooling funds, and contingency loans, requiring substantial multi-year funding; risk transfer via insurance; and risk reduction by providing high-quality public infrastructure.

Furthermore, household and community life insurance aims to mitigate the risks of casualties and economic and physical losses, support the reconstruction of homes and businesses, and help communities protect themselves against disaster impacts. Risk-bearing and risk-transfer mechanisms provide government financing support, with insurance facilitating the rebuilding of destroyed homes and the restoration of business capital lost or diminished due to disasters.

As such, it becomes evident that a diversified mix of policies and financing instruments is imperative, as no single instrument can effectively address the multifaceted nature of disaster risks. This strategic blend of financing mechanisms enhances the country's preparedness and response capabilities and ensures a more resilient and adaptive approach to managing disasters' economic and social impacts. By leveraging a combination of government funds, insurance, and external aid, Indonesia can better mitigate the impacts of disasters and expedite recovery efforts, ultimately fostering a more resilient nation.

3.2 Public Financing in Disaster

Public financing is an essential instrument for disaster mitigation and management. With the rising frequency and intensity of disasters attributed to climate change, the need for adequate financial resources has become increasingly urgent. Public financing serves as emergency funds during disaster events and long-term investments in prevention and risk reduction strategies. Through strategic and targeted budget allocations, the government can fortify infrastructure, enhance response capabilities, and foster community resilience against diverse disaster threats.

The State Budget is a primary disaster management financing source in Indonesia, as Government Regulation No. 22 of 2008 stipulated. The government identifies the financial requirements for various stages of disaster management, including mitigation, preparedness, emergency response, and recovery. The disaster management budget has four primary components to ensure the efficient and targeted allocation of funds. Firstly, the Daftar Isian Pelaksanaan Anggaran Kementerian atau Lembaga (DIPA K/L) delineates the allocation of the APBN for specific ministries or agencies involved in disaster management activities. The DIPA K/L funds are utilised for pre-disaster and post-disaster phases, encompassing a wide range of activities to reduce disaster risks and facilitate recovery efforts. Additionally, there are provisions for refocusing these funds during the emergency response stage to address immediate needs and ensure a rapid and effective response.

Secondly, the DSP, managed by the BNPB, are specifically earmarked for urgent emergency responses. This budget component ensures that immediate financial resources are available to address critical needs in the aftermath of a disaster, facilitating rapid intervention and support to affected communities. The DSP is a vital instrument in ensuring that emergency response efforts are not delayed due to financial constraints, thereby enhancing the overall effectiveness of disaster management operations.

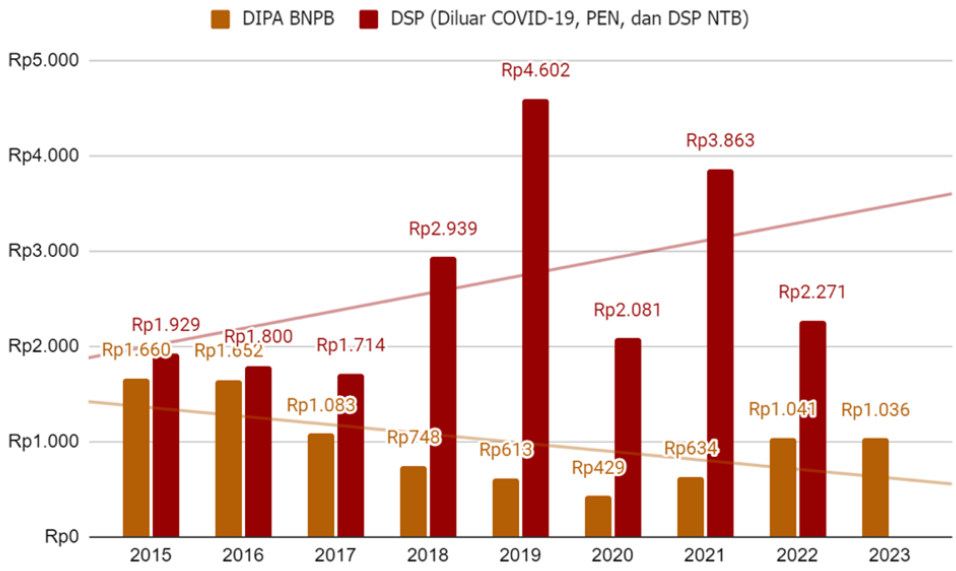

Figure 8. DIPA utilisation by BNPB
Source: Authors, 2024

Figure 8 provides a detailed illustration of the trend in BNPB's utilisation of DIPA. The orange bars represent DIPA allocations, while the red bars indicate the DSP. Over the years, there has been a noticeable decline in the utilisation of DIPA by BNPB, which is followed by a significant increase post the onset of the COVID-19 pandemic. A noticeable trend in the disaster management budget illustrates the decreasing allocation for the BNPB's DIPA, contrasted with the increasing allocation for the DSP. This shift indicates a tendency towards curative disaster management strategies rather than preventive measures. The rise in DSP allocation correlates with the increasing frequency and severity of disasters, underscoring its reactive nature. However, this trend highlights the need for a balanced approach prioritising preventive strategies to reduce disaster risks effectively.

In 2019, the DSP reached its peak, a consequence of the numerous disasters that occurred in 2018, necessitating a substantial allocation of funds for immediate disaster response and recovery efforts. The years 2020, 2021, and 2022 saw elevated DSP levels, driven primarily by the distress of the COVID-19 pandemic, which required large sums of readily accessible funds to address the crisis's multifaceted impacts.

It is crucial to highlight that the on-call funds allocated during these years were distinct from the National Economic Recovery (Pemulihan Ekonomi Nasional/PEN) program. The PEN program was specifically designed to address the economic ramifications of the COVID-19 pandemic. In contrast, broader emergency response and recovery needs use DSP. This distinction underscores the government's multifaceted approach to managing both the health crisis and its broader socio-economic impacts through targeted financial mechanisms.

Furthermore, despite the critical role of DSP in emergency responses, accessibility issues persist. Certain key ministries, such as the Ministry of Social Affairs (Kementerian Sosial/Kemensos), are unable to access DSP for emergency social

assistance. This limitation restricts the comprehensive deployment of resources necessary for effective disaster response and recovery. Furthermore, based on our interviews with the Directorate of Social Protection for Disaster Victims, additional budget request allocation or the BA BUN 999.08, for emergency social assistance under the Ministry of Social Affairs, is insufficient, covering only half of the actual needs. This shortfall highlights the inadequacy of current funding mechanisms to meet the full spectrum of emergency requirements.

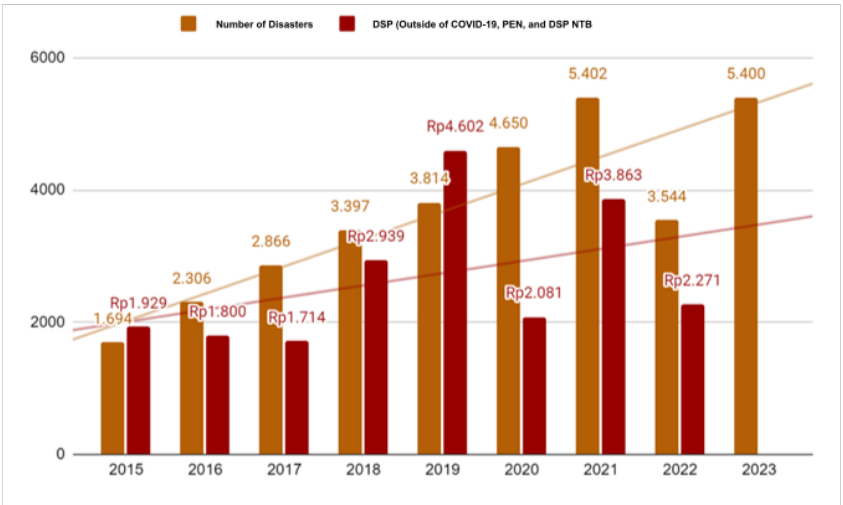

Figure 9. On-Call Funds and Number of Disasters

Source: BNPB, 2023

The findings illustrated in Figure 9 reveal the relationship between on-call funds and the frequency of disasters. The chart employs orange bars to represent on-call funds and red bars to denote the number of disasters. Typically, a rise in the number of disasters is associated with an increase in the utilisation of DSP, reflecting a responsive allocation of resources to address emergency needs. However, the year 2020 presents a notable exception to this trend. During this period, a substantial portion of the DSP, amounting to IDR 10 trillion, was earmarked specifically for addressing COVID-19-related challenges. As a result, the expected correlation between the frequency of disasters and DSP utilisation was disrupted, with a significant portion of the funds being redirected to meet the urgent demands of the pandemic. This divergence highlights the impact of extraordinary events on resource allocation and underscores the need for flexible financial strategies in managing concurrent crises.

Another APBN component to fund disaster risks is BA BUN 999.08, which refers to the disaster budget managed by the Ministry of Finance. This allocation is designed to address a wide array of urgent and unforeseen needs, including disasters and other crises that may arise unexpectedly. The primary component of BA BUN 999.08 is the BTT, which provides the necessary financial flexibility and readiness to respond to emergency and post-disaster phases. This ensures that the government can quickly mobilise resources to manage and mitigate the impacts of unforeseen events, maintaining a high level of preparedness and responsiveness. While this instrument is mentioned in Government Regulation No. 22 of 2008, it lacks clarity in its practical application. This ambiguity in implementation hinders the effective mobilisation of resources during unforeseen emergencies. Thus, this suggests a need for more explicit guidelines and operational frameworks.

Lastly, the Grant for Rehabilitation and Reconstruction (Hibah Rehabilitasi dan Rekonstruksi/Hibah RR) is dedicated to supporting activities aimed at restoring the conditions of disaster-affected areas and communities. This includes rehabilitating critical infrastructure, economic recovery initiatives, and reconstructing social facilities and public services. The Hibah RR is instrumental in ensuring that recovery efforts are comprehensive and sustainable, enabling affected communities to rebuild and enhance their resilience against future disasters. Practically, the utility of Hibah RR is limited to repairing damaged infrastructure. This restriction excludes the broader concept of "building back better," encompassing structural mitigation measures designed to enhance resilience against future disasters. The aforementioned restriction is partly due to the nature of mitigation measures often perceived as pre-disaster measures, while Hibah RR is strictly for post-disaster and recovery measures. Hence, this inability to fund comprehensive mitigation efforts with Hibah RR funds emphasises a significant gap in fostering long-term community resilience.

At the regional level, the primary funding source is the APBD, which is sourced from the central government. In the context of disaster management funding, APBD is pivotal, given the streamlined access local governments have compared to awaiting transfers from the APBN to address disaster needs. The APBD employs three principal channels for all disaster phases: DIPA for relevant local government organisations (Organisasi Pemerintah Daerah/OPD), DSP within the BPBD budget, and the BTT of the APBD. The DIPA in government agencies related to disaster management is utilised across all disaster phases.

Implementing the APBD in disaster management shows several critical issues and notable trends that highlight challenges and areas for improvement. According to the Minimum Service Standards (*Standar Pelayanan Minimal*/SPM) for disasters as outlined in Permendagri 101 of 2018, there has been a lack of sufficient impetus to encourage the allocation of local government disaster budgets towards more preventative measures. This has resulted in a shortfall in comprehensive disaster budgeting, limiting the effectiveness of local disaster preparedness and mitigation efforts.

Financial allocation for disaster management remains insufficient across many regions, with most local governments dedicating less than 2 per cent of their budgets to this critical area. This is particularly concerning for the 486 districts and cities identified as having medium to high disaster risk. In many cases, the allocated funds are only enough to cover basic operational costs, leaving little room for proactive disaster preparedness initiatives. Moreover, patterns in disaster management spending show that regions previously affected by major disasters tend to allocate higher budgets for disaster management. This reactive trend underscores the need for a shift towards more forward-thinking and preventive approaches to disaster management.

The capacity for BTT at the regional level is another area of concern. The majority of regions, specifically 28 provinces, have BTT budgets of less than IDR 100 billion, which is inadequate for comprehensive disaster response and recovery efforts. This limitation further hampers the ability of local governments to manage and mitigate disaster impacts effectively. Additionally, incorporating disaster management into

regional development plans (RPJMD) remains inconsistent, with only 50 per cent of local governments including disaster management considerations in their development strategies. This gap highlights the need for more integrated planning and the development of specific disaster management plans across all regions.

Fiscal constraints and competing regional priorities also play a significant role in the allocation of disaster management funds. Limited financial resources often lead local governments to prioritise economic development over disaster preparedness and mitigation. This prioritisation, while understandable, can have long-term negative consequences on regional resilience to disasters. Furthermore, the utilisation of disaster management funds by the BPBD is predominantly focused on reactive measures. Response efforts, such as emergency relief and recovery, comprise the majority of the budget rather than preventive measures and mitigation strategies. This curative focus limits the potential for reducing disaster risks and enhancing community resilience in the long term.

3.3 Disaster Insurance Mechanism

3.3.1 Climate Non-Indemnity Insurance

In accordance with climate insurance, which is carried out using parametric or other non-indemnity methods, several products are already in the Indonesian insurance market. PT Jasindo runs the Area Yield Index Insurance (AYII) product with the assistance of JICA. This type of index insurance provides protection based on the average rice yield at the village level, not the individual (JICA, 2022; JICA, 2023). Compensation is paid when the village's average yield falls below a benchmark value set based on historical data. AYII protects farmers from systemic risks such as drought, floods, and pests. The basic concept of AYII is to reduce moral hazard and unfavourable selection, as insurance payments are based on village average yields rather than individual yields.

Zurich Takaful Insurance in Indonesia introduced Indonesia's first weather index parametric insurance product, launched in March 2022 (Zurich Indonesia, 2022). The product is specifically designed to protect coffee farmers in Aceh from adverse weather risks. It uses a weather index to determine claim payments, which enables a faster and more efficient claims process. The product protects 1500 coffee farmers in Aceh, intending to help them manage volatile weather risks and increase their resilience to climate change (Saputra, 2023).

Moreover, AXA Mandiri Insurance developed a weather index insurance product to protect farmers from the risk of extreme weather changes (Walfajri, 2020). The product uses historical weather data to determine the appropriate level of risk and premium. AXA Mandiri Insurance aims to provide better protection to farmers through a more measured and data-driven approach, helping them reduce losses caused by extreme weather and improve their financial resilience.

Based on interviews with DPPP OJK, eight companies currently have parametric insurance licenses for agricultural and plantation products. However, qualitatively, the

product in the market has a less-than-ideal performance in terms of loss ratio. Each company's reach poses a challenge, which is still limited to certain homogenous locations and the achievement of the Law of Big Numbers. Therefore, support related to incentives and outreach expansion is still needed.

3.3.2 Micro Insurance

The microinsurance sub-sector has experienced growth in recent years (Figure 25). Microinsurance products have grown since the launch of the Microinsurance Development Grand Design by OJK in 2013, and several microinsurance products were later adopted by several private companies (OJK, 2013). In addition, this growth can be attributed to its untapped potential and its suitability to people's ability and willingness to pay. Microinsurance can also be purchased immediately, does not require a medical examination, and can be used directly for claims (KPMG, 2016; AAJI, 2022).

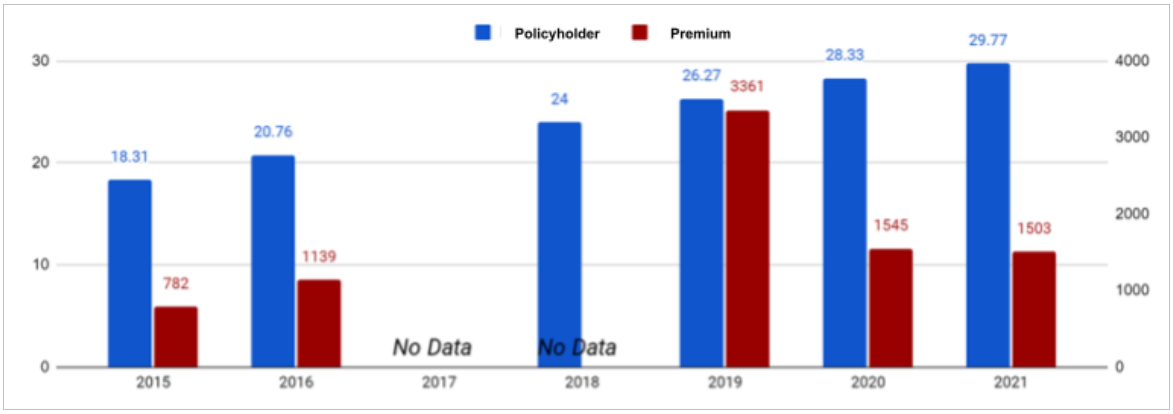

Figure 10. Growth of Policyholders and Premiums of Microinsurance 2015-2021
Source: OJK, 2022

The insurance company has a product for business interruption called "Stop Usaha" (Stop Business Interruption), which covers fire, stove or gas explosion, aeroplane crashes, smoke from surrounding buildings, riots, vehicle collisions, and disaster risks such as earthquakes, tsunamis, and volcanic eruptions. This product only requires an annual premium payment of IDR 40 thousand for a fixed payment of IDR 2.5 million in the event of a disaster. However, marketing this product has been difficult. Based on interviews with representatives of private (non-SOE) insurance companies, in the eight years after its issuance, the uptake was lower than expected, and it did not reach the targeted volume. The product has been more successful in the provision of insurance linked to banks that finance MSMEs (such as BRI, which has a portfolio of over 80 per cent of MSME financing), where financing is linked to insurance from a subsidiary. In addition, the payout (from Stop Usaha), although provided without a lengthy verification process, was quite low compared to the potential exposure, thus providing only initial capital for recovery.

Considering these challenges and opportunities, it is crucial for insurers, regulators and the government to jointly develop other catastrophe microinsurance products that are more innovative and in line with the needs of the community. In addition, collaboration with financial institutions and financial technology (fintech) can open up

new opportunities to expand the reach of disaster microinsurance. Through collective and sustained efforts, microinsurance can be an effective tool in improving the resilience and preparedness of Indonesian communities against disaster risks.

3.3.3 Social Insurance

Both social insurance schemes in Indonesia experienced similar trends during the COVID-19 pandemic. Each BPJS Kesehatan and BPJS Ketenagakerjaan (active participants) decreased from 2019 to 2020 (Figure 26). With the economy contracting, companies laid off some of their workers. Around 29.12 million people were affected by the pandemic, with around 2.56 million people losing their jobs and 24 million experiencing reduced working hours (BPS, 2020). BPJS membership increased again in the following years, along with economic recovery and government support for increasing community participation through various bundling schemes with other public services.

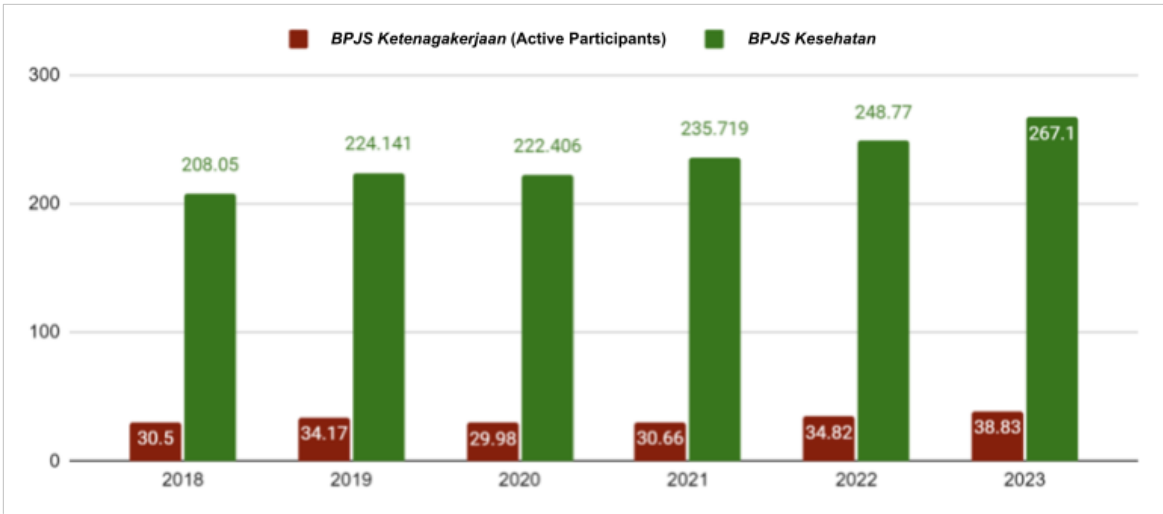

Figure 11. Active Participation in BPJS Employment and BPJS Health
Source: BPJS Kesehatan, 2024; BPJS Ketenagakerjaan, 2024

In addition, BPJS Kesehatan is still the most affordable health service for low- and middle-income people. Additionally, the Ministry of Social Affairs Regulation No. 21 of 2019 mandates that the government pays BPJS premiums for people experiencing poverty through the BPJS Health Contribution Assistance Programme. On the other hand, BPJS Ketenagakerjaan also reached 34 million active participants by 2022 due to better economic conditions in terms of labour and business. However, the rapid increase in participation, especially in 2022, is most likely due to Presidential Instruction No. 1 of 2022, which ensures BPJS Health participation in taking care of SIM, STNK, Hajj registration, land transactions, business license requests, and public services (Fadhillah, 2022).

However, the future challenge for social insurance is to ensure that the program design is able to respond to disaster risks and climate change impacts (Sengupta et al., 2023). Based on interviews with BPJS Ketenagakerjaan, some products are considered responsive to disasters, especially JKM, JKP, and JKM, as well as JKK in the event of

accidents at work due to disasters. However, an aspect that has not been considered is the expansion mechanism needed when a disaster occurs. One effective approach is to implement temporary and permanent expansions of social insurance schemes (Sengupta et al., 2023). Temporary expansions can include vertical expansion measures such as providing top-up benefits for insured participants during emergencies. Horizontal expansion could include extending mandatory coverage to more people by reforming the design of permanent policies to cover a wider population segment. In addition, utilising existing payment and communication mechanisms, known as piggybacking, can help the rapid spread of benefits. Other adaptive measures could include temporarily relaxing contribution requirements and eligibility criteria to extend coverage during emergencies.

Considering the fiscal implications of these measures is crucial. Developing a risk financing strategy and identifying overall government priorities will ensure that adequate funding is available to support the expansion of temporary and permanent social insurance schemes (Sengupta et al., 2023). This risk financing strategy could include appropriate budget allocations, cooperation with the private sector, and the use of innovative financial instruments to strengthen fiscal resilience to disasters. Thus, the social insurance system will be better prepared for future challenges and able to provide better protection to disaster-affected communities.

3.3.4 Earthquake Property Insurance

Based on OJK and Indonesian General Insurance Association (Asosiasi Asuransi Umum Indonesia/AAUI) standards, property insurance generally consists of three main products. First, the Indonesian Standard Fire Insurance Policy covers fire, lightning, explosion, smoke (from other burning buildings) and the impact of falling aircraft. This insurance product can be extended to riots, strikes, intentional damage, riots, floods, typhoons, hurricanes, and water damage. Second, the Property All Risk Insurance Policy covers the risk of physical loss or damage (excluding earthquake and tsunami risk). A Business Interruption Insurance policy can be added to the standard property insurance to ensure compensation for loss or loss of income due to material damage. Third, the Indonesian Earthquake Insurance Standard Policy is an additional policy that must be purchased to cover the risk of earthquakes and other disasters. This policy covers the risks of earthquakes, volcanic eruptions, tsunamis, and fires and explosions caused by earthquakes, volcanic eruptions, or both.

Although the products already exist, one of the problems is to encourage the utilisation of these earthquake insurance products. Indonesia has historically underutilised earthquake insurance as a country with a high earthquake risk. MAIPARK, a major reinsurance company in Indonesia, had historical data records that showed the 2004 Aceh Earthquake and Tsunami along with the 2006 Yogyakarta Earthquake caused losses of IDR 51.4 trillion and IDR 26.1 trillion, while total insurance claims amounted to only IDR 803 billion and IDR 302 billion, respectively (Ministry of Finance, 2018; Maipark, 2023). The 2018 Lombok earthquake caused losses of IDR 12 trillion, while insurance claims amounted to IDR 371 billion (Gumelar, 2018; Maipark, 2023). In addition, only IDR 31.5 billion was claimed out of IDR 4 trillion in losses in Cianjur (Fikri, 2022). Most of these claims came from business properties such as hotels, apartments, restaurants, and industries, and less from households and MSMEs.

Table 1. Property Insurance Claims in National Disasters

No	Event	Date of Event	Earthquake Magnitude	Max MMI	Depth (km)	Exposed Assets (IDR Billion)	Incurred Claim Value (IDR Billion)	Claim-to-Exposure Ratio
1	PADANG	30-Sep-09	7.6	VIII	70	4,536.41	1,045.95	23.10%
2	DONGGALA	28-Sep-18	7.9	VIII	10	13,545.58	1,079.29	8.00%
3	ACEH	26-Dec-04	9.1	IX	30	1,199.34	370.73	30.90%
4	LOMBOK	29-Jul-18	6.9	VII	31	4,632.80	756.71	16.30%
5	YOGYAKARTA	27-May-06	5.9	IX	15	10,674.95	399.16	3.70%
6	MT. MERAPI	5-Nov-10	- (Volcanic Eruption)	-	-	2,749.34	205.43	7.50%
7	MAJENE	15-Jan-21	6.2	VII	18	12,412.89	285.35	2.30%
8	ANAK KRAKATAU	22-Dec-18	- (Volcanic Eruption)	-	-	11,809.62	23.81	0.20%
9	BENGKULU	4-Jun-00	7.9	VIII	33	10,765.53	41.39	0.40%
10	BIMA	29-Nov-07	6.7	VII	21	21,634.49	48.91	0.20%
11	PADANG	6-Mar-07	6.4	VIII	30	21,974.02	42.04	0.20%
12	CIANDUR	21-Nov-22	5.6	VII	11	23,257.52	28.74	0.10%
13	MERAPI	25-Oct-10	- (Volcanic Eruption)	-	-	21,589.66	27.9	0.10%
14	TASIKMALAYA	2-Sep-09	7.3	VIII	49	9,855.41	23.47	0.20%
15	PADANG	6-Mar-07	5.8	VIII	53	8,950.04	22.91	0.30%
16	JAYAPURA	9-Feb-23	5.4	IV	10	12,617.76	3.39	0.00%

Source: BPJS Kesehatan, 2024; BPJS Ketenagakerjaan, 2024

The majority of earthquake insurance users are in the industrial and commercial sectors. The percentage contribution of the agricultural sector to the total value is below 1 per cent each year. The commercial sector fluctuates between 19.60 per cent to 22.40 per cent, increasing from 2019 to 2023. The industrial sector makes the largest contribution percentage, reaching around 65 per cent to 68 per cent annually. Meanwhile, the percentage contribution of the residential sector ranges from 14 per cent to 9 per cent and decreases from 2019 to 2023.

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Table 2. Use of Property Insurance Based on Occupancy

Occupation	UV 2019 (Value)	%	UV 2020 (Value)	%	UV 2021 (Value)	%	UV 2022 (Value)	%	UV 2023 (Value)	%
AGRICULTURAL (A)	10.88	0.29%	8.23	0.24%	6.47	0.16%	8.66	0.19%	10.63	0.25%
COMMERCIAL (C)	812.77	21.27%	693.65	19.04%	874.18	21.99%	958.76	21.15%	947.55	22.12%
INDUSTRIAL (I)	2,319.79	61.34%	2,226.59	63.79%	2,476.14	62.25%	2,937.70	66.11%	2,993.59	70.05%
RESIDENTIAL (R)	535.5	13.92%	378.75	10.73%	573.28	14.41%	545.15	12.55%	278.19	6.51%
TOTAL	3,759.94	100.00%	3,307.93	100.00%	3,970.56	100.00%	4,450.41	100.00%	4,229.96	100.00%

Source: Maipark Reinsurance, 2024

Based on our interviews with Maipark Reinsurance, insurance companies stated there is no problem marketing insurance products to medium and large enterprises, especially in the industrial and commercial sectors. This is because (1) medium and large enterprises in these two sectors must purchase insurance on their assets obtained through bank loans, and (2) medium and large enterprises in these two sectors generally have risk management units that require the use of insurance. Therefore, the challenge in property insurance is developing and marketing insurance products to MSMEs and residential houses.

3.4 Alternative Funding for Disaster

3.4.1 Grants

One of the instruments in DRF is grants. This instrument is a vital source of income. It comes from various entities, including international aid, local government contributions, the private sector, and community donations (crowdfunding) in the form of money, foreign exchange, goods, services, or securities. The grants are utilised in two main phases of disaster management: rehabilitation and reconstruction. The rehabilitation phase focuses on restoring all aspects of public or community services to an adequate level. In contrast, the reconstruction phase focuses on rebuilding infrastructure, facilities, and institutions in disaster-affected areas.

The Ministry of Finance determines the distribution of grants to local governments affected by the disaster based on proposals from BNPB. This process ensures that funds are allocated appropriately and per the field's needs. BPBD then implements rehabilitation and reconstruction activities, assisted by related regional apparatus and agencies, so that coordination and implementation can run effectively and efficiently.

In disaster management efforts, Indonesia not only relies on internal resources but also utilises external support from the international community. Meanwhile, the government receives foreign grants through BNPB. International grants often come from agencies such as the United Nations (UN), the World Bank, international non-governmental organisations with expertise and resources to assist disaster-stricken countries, and bilateral donors.

In 2018, the World Bank provided USD 1 billion in aid to Indonesia for the earthquake disaster in Sulawesi and Lombok, primarily focused on reconstruction efforts (World Bank, 2018). According to a report by USAID (2019), at least 19 countries had pledged or provided more than USD 50 million in financial and in-kind assistance to help Indonesia as of mid-October. About USD 12.9 million was allocated to the UN Central Sulawesi Earthquake Response Plan, which accounts for about 26 per cent of the USD 50.5 million needed.

On October 18, the US government announced an additional USD 3 million to meet urgent humanitarian needs in Indonesia. The US Department of Defense (DoD) is providing up to USD 5 million to meet humanitarian needs validated by USAID/OFDA, bringing total US support to USD 11.7 million. Additional USAID/OFDA funds will be used for emergency needs, child protection, shelter, water, sanitation, and hygiene (WASH), as well as providing technical assistance to the Government of Indonesia. In addition, the Government of Germany, through the KfW Development Bank, is allocating approximately USD 28.4 million to rebuild damaged facilities and infrastructure in Central Sulawesi and West Nusa Tenggara (NTB) (UNDP, 2023). In response to the Lombok earthquake, UNICEF has also contributed USD 5 million to support aspects such as education, health, nutrition, sanitation, and child protection.

In addition to international funding sources, local governments also provide grants to support disaster management initiatives in their areas. These contributions can include budget allocations for developing disaster-resilient infrastructure, disaster preparedness training for communities, and logistics and emergency assistance during disasters. One of them is the Surabaya City Government. As support for handling the earthquake disaster in Lombok in 2018, the Surabaya City Government provided medical assistance and established three aid posts spread across three sub-districts. The role of regional grants was also shown by the distribution of health assistance of IDR 500 million from the Bogor City Government to hundreds of victims of the Cianjur earthquake that occurred at the end of 2022. Furthermore, the Bogor Regency Government also showed concern in handling the Cianjur earthquake by distributing personnel from the Bogor Regency BPBD. These personnel assisted in various rescue and recovery operations to accommodate the risks that arose.

In addition to local governments and international institutions, non-governmental actors such as NGOs and the private sector actively distributed disaster donations. Assistance can be provided directly or through digital fundraising platforms like KitaBisa or religious organisations such as Baznas. The general public, as individuals, can also participate through online and offline donations, so individual donations become a significant source of donations. Crowdfunding platforms and charities become important intermediaries because they offer convenience, transparency, and choice in distributing donations.

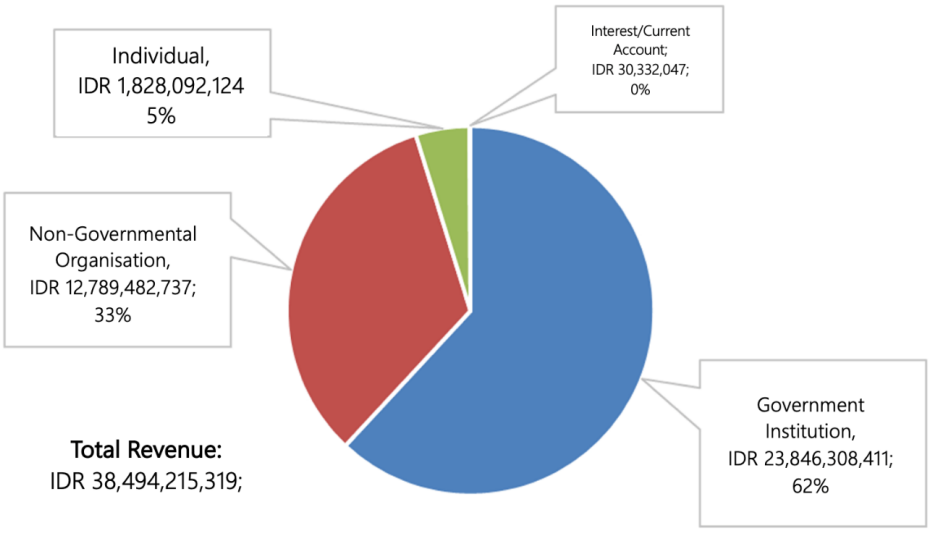

Figure 12. Recapitulation of Cianjur Earthquake Donation Fund Receipts 2022-2023 (Update April 2023)

Source: Cianjur Regency Government, 2023

The case study of the Cianjur Earthquake in November 2022 shows the dominant role of government institutions in mobilising donations, followed by significant contributions from non-governmental organisations and individual donations reaching IDR 1 billion. The use of disaster funds generally prioritises urgent needs during the emergency response phase, such as the provision of debris removal

equipment and temporary housing assistance. Effective disaster management requires comprehensive data integration, especially for donations from NGOs and individuals, and expanding the use of non-governmental and individual funding sources outside the emergency response phase.

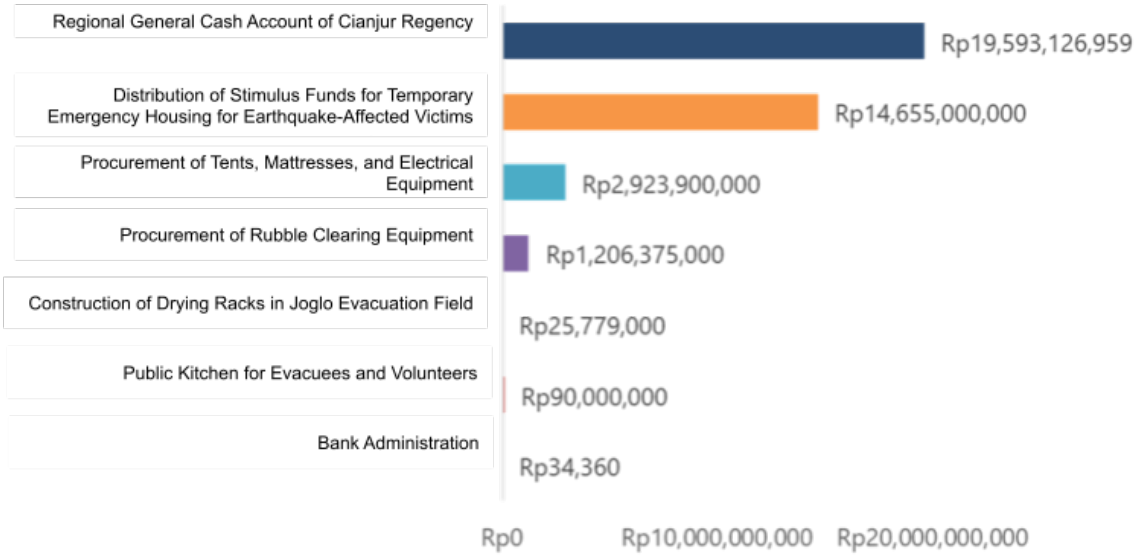

Figure 13. Recapitulation of Realisation of Cianjur Earthquake Donation Funds 2022-2023 (Update April 2023)

Source: Cianjur Regency Government, 2023

There is a need for several recommendations to address the challenges of optimising the use of donations for disasters, especially from non-governmental organisations and individuals. First, there is a need to strengthen data integration and transparency to encourage effective collaboration and coordination and improve accountability and monitoring. Second, efforts are needed to expand the use of donation funds for long-term post-disaster recovery. By implementing these recommendations, the government can effectively utilise alternative funding sources for disaster management. This ensures that these resources are efficiently and effectively used to support post-disaster communities and improve long-term resilience.

4. Building a Disaster Resilient Future:

Context, Political Economy, and Power Dynamics

Several key issues and discussion points have been identified concerning implementing DRF in Indonesia. While opportunities exist to strengthen and expand these efforts, several challenges hinder effective implementation. Addressing these issues is crucial for enhancing Indonesia's resilience to disasters and ensuring that vulnerable communities receive the support they need.

One significant opportunity for advancing disaster risk financing in Indonesia lies in regulatory revisions to strengthen disaster management financing. Current laws, including Law No. 24 of 2007 and Government Regulations No. 21 and 22 of 2008, were enacted with foundational support but now require updates to address new realities in disaster risk management. These revisions would allow for incorporating Indonesia's evolving DRFI Strategy, reflecting recent developments in financing mechanisms and formalizing the roles of stakeholders such as local governments and the private sector. These actors can better contribute to disaster risk reduction and financing through clear and defined roles, pooling resources, expertise, and funding for pre- and post-disaster management (BNPB, 2023). This integration could enhance preparedness and resilience nationwide, especially for high-risk regions with limited financing options.

The expansion of micro-disaster insurance products presents another promising opportunity to reach a broader spectrum of underserved groups, particularly SMEs and low-to-middle-income communities. Currently, most microinsurance products are based on a 2013 Grand Design for Micro Insurance Development, which needs updating to align with today's risk landscape. Government support, such as research funding and policy incentives, could drive innovation in affordable insurance options for the climate-sensitive sectors these communities depend on. Low-income communities could better manage disaster impacts by expanding access to tailored insurance. SMEs, which form a large part of the economy, could reduce financial vulnerability, making this a crucial step in bolstering Indonesia's economic resilience to disasters (Financial Services Authority, 2022).

The mandate for mandatory disaster insurance, introduced in the Financial Sector Development and Strengthening Law, creates further opportunities to broaden insurance access across vulnerable sectors. With clear technical regulations, this mandate could prompt insurance providers to offer targeted products that protect high-risk businesses and public infrastructure. This approach could increase insurance coverage, directly reducing the financial toll of disasters and strengthening Indonesia's overall resilience to large-scale events (Ministry of Finance, 2023).

Finally, the integration of DRF with Adaptive Social Protection (ASP) opens doors to enhanced disaster response for vulnerable populations. By linking DRF with ASP systems, Indonesia

could better ensure the availability of rapid, adequate financing to support social programs when disasters strike. For ASP to work effectively as a social safety net, the financial resources must be reliable and deployable at a moment's notice, allowing for immediate assistance and stabilizing communities in crisis. Such an integrated approach would address both the immediate and long-term recovery needs of those most impacted by disaster events (BNPB, 2023).

However, challenges remain in realizing the full potential of DRF in Indonesia, notably in coordination across policy-making efforts. Clear coordination mechanisms are essential to prevent overlapping interventions among government agencies and private sector players. Current DRF efforts are hindered by siloed operations, where government and private sector roles lack synergy, potentially leading to redundancy and inefficient resource use. Establishing a coordinated framework that defines the roles and contributions of each sector could resolve these overlaps, creating a more cohesive approach to disaster risk financing (BNPB, 2023).

Another notable challenge is the incorporation of disaster risk analysis and metrics into DRF. While disaster-related indices like the IRBI provide essential insights into the potential risks and impacts, they do not yet capture the effects of DRF measures on disaster management outcomes. To address this gap, BNPB has begun updating IRBI to include aspects like disaster expenditure, insurance utilization, and investments in risk reduction. However, without a comprehensive framework that captures these metrics, it is difficult to assess the actual impact of DRF on resilience and recovery at both the national and local levels (BNPB, 2023).

The lack of disaster-based fiscal projections also poses challenges in integrating DRF into development planning. While current risk analyses estimate maximum disaster losses, these figures are not usable for fiscal forecasting or prioritizing disaster risk reduction investments. As a result, policymakers lack the data needed to allocate budgetary reserves for potential disasters, which impedes preparedness. Developing probabilistic disaster risk projections could empower Indonesia to make more informed fiscal decisions, ensuring that resources are available when disasters inevitably occur (Ministry of Finance, 2023).

In addition, government-initiated climate insurance programs need evaluation and refinement to improve sustainability. Presently, these programs face challenges in maintaining balanced rates and effective targeting, often requiring subsidies due to the limited fiscal capacity of the government. However, adverse selection among policyholders remains a challenge, as individuals who are more prone to disasters are more likely to participate, skewing loss ratios. Additionally, public awareness about voluntarily utilizing insurance remains low due to limited financial literacy. Thus, redesigning these programs with clearer targeting criteria and educational initiatives could promote more sustainable participation (Financial Services Authority, 2022).

Lastly, delays in emergency social assistance highlight the need for more robust DRF support mechanisms within ASP. Current contingency funds, such as DSP, are often insufficient or delayed, which hampers timely emergency social assistance. Integrating DRF directly into ASP funding frameworks could address these delays, ensuring immediate financial support for

vulnerable populations. This requires regulatory adjustments that clearly define DRF's role in social protection, ensuring readiness in the face of emergencies and enabling a more resilient and adaptive support system for communities (BNPB, 2023).

In conclusion, while the implementation of DRF in Indonesia presents numerous opportunities for strengthening resilience and providing support to vulnerable communities, several challenges must be addressed to optimize its effectiveness. By revising regulations, enhancing coordination, integrating risk analysis, and evaluating existing programs, Indonesia can create a more cohesive and effective disaster risk financing framework. Ultimately, by seizing these opportunities and addressing the challenges, Indonesia can improve its preparedness for disasters, ensuring that resources are allocated efficiently and that communities are equipped to withstand and recover from the impacts of disasters.

5. Conclusion and Recommendation

Based on the study, several strategic issues have been identified concerning implementing Disaster Risk Financing and Insurance (DRF) in Indonesia. These strategic issues will form the basis for the recommendations for the way forward of the DRF implementation. The identified strategic issues are as follows:

1. Regulation Updates for Disaster Management Financing:

- The achievements of the DRFI Strategy and future implementation effort necessitate updates to several regulations governing disaster management financing. Key regulations that require revision include Law No. 24 of 2007, Government Regulations No. 21 and 22 of 2008, and other relevant regulations to ensure the optimal future implementation of DRF.

2. Coordination and Synergy in Policy Making within the government and private sector

- The current coordination scheme is not yet clear for formulating efficient disaster risk finance policies, as existing interventions tend to overlap.

3. Integration of Risk Analysis and Metrics with DRF:

- Current disaster risk analysis and metrics have yet to integrate DRF. Disaster-related indices such as IRBI and its derivatives have not yet captured the impact of DRF implementation on disaster management. The National Disaster Management Authority (BNPB) is updating IRBI to include aspects of disaster financing, such as disaster expenditure, insurance utilisation, and other risk reduction investments.

4. Disaster-based Fiscal Projections:

- Disaster-based fiscal projections are not yet feasible or integrated into development planning due to the non-probabilistic nature of current risk analysis. While BNPB's RBI studies can estimate maximum disaster losses, this information is not yet usable for prioritising disaster risk reduction investments or preparing fiscal reserves for disasters.

5. Development of Micro Disaster Insurance:

- Current micro disaster insurance products are limited to those developed based on the 2013 Grand Design for Micro Insurance Development, and private sector providers of climate insurance products need support for product development. This can be supported through research and development funding or policy incentives that enable the development of more climate insurance products. Given the limited purchasing capacity and preference (based on per capita income), awareness, and practicality preference of SMEs and lower-middle-income groups, further development of microinsurance in Indonesia is necessary.

6. Detailed Implementation of Mandatory Disaster Insurance:

- There is a need for further details regarding mandatory disaster insurance mandated in the Financial Sector Development and Strengthening Law. There is confusion regarding how the implementation of the mandatory disaster insurance mandate would be. However, the mandate opens opportunities for broader insurance and protection development against disaster risks. Therefore, the implementation requires technical regulations detailing how this mandatory disaster insurance.

7. Evaluation of Government-Initiated Climate Insurance:

- Government-initiated climate insurance programs need to be evaluated in terms of rates, design, and targeting of beneficiaries and gradually phased out of the subsidy scheme. The coverage of these programs is limited and depends on government fiscal capacity. The loss ratio indicates adverse selection among policyholders who are more prone to disasters. Additionally, public awareness of the need to voluntarily utilise insurance is limited because of low literacy and the tendency to participate if there is a subsidy.

8. Integration of Adaptive Social Protection with DRF:

- Adaptive Social Protection (ASP) have yet to integrate DRF, especially in ensuring rapid and adequate financing. With social protection reform through ASP expected to materialise, supportive financing strategies are needed—particularly responsive, sufficient, and sustainable financing. How DRF supports ASP still needs to be regulated and detailed. Interviews revealed that contingency instruments like DSP do not support emergency social assistance programs, sometimes leading to delays in fund disbursement.

Initial Recommendations for Developing Indonesia's DRFI Strategy

Based on the study findings, several recommendations for improving the DRFI Strategy way forward can be formulated:

1. Revising Regulations Related to Disaster Management Financing:

Several regulations and sections that need revision or updates include:

- Law No. 24 of 2007 on Disaster Management;
- Government Regulation No. 21 of 2008 on Disaster Management Implementation;
- Government Regulation No. 22 of 2008 on Disaster Relief Funding and Management;
- Government Regulation No. 12 of 2019 on Regional Financial Management;
- Minister of Home Affairs Regulation No. 77 of 2020 on Technical Guidelines for Regional Financial Management;
- Minister of Finance Regulation No. 105/PMK.05/2013 on Disaster Management Budget Implementation Mechanism and Regulation No. 173/PMK.05/2019 on Amendments to Regulation No. 105/PMK.05/2013;
- Minister of Finance Regulation No. 29 of 2024 on Post-Disaster Rehabilitation and Reconstruction Grant Management; and
- BNPB Regulation No. 1 of 2024 on Fund Disbursement Review, Verification, and Evaluation.

2. Improving Disaster Management Metrics and Indices:

Review the components of IRBI and supporting indices to include DRF indicators, such as the utilisation of ABMN, availability and utilisation mechanisms of BTT for disasters, regional disaster expenditure, insurance utilisation, social protection coverage, and regional fiscal capacity.

3. Developing Probabilistic Risk Analysis and Fiscal Projections:

Steps for further developing national risk analysis methods include:

- Formulating probabilistic risk analysis methodology and setting data standards
- Analysing disaster losses and impacts considering loss realisation probabilities
- Studying emergency fiscal needs at the national level
- Preparing guidelines and supporting regulations for local governments
- Facilitating training on probabilistic risk calculations and regional emergency fiscal needs.

4. Developing Market-Based Micro and Climate Insurance Products:

Support the development of micro and climate insurance products for product research and development. Current products are limited to those offered by PT Jasindo and those resulting from the 2013 Grand Design for Micro Insurance Development.

5. Formulating Detailed Regulations for Mandatory Disaster Insurance:

Detailed implementation of mandatory disaster insurance as mandated by the Financial Sector Development and Strengthening Law, including:

- Determining criteria for groups required to have disaster risk home insurance;
- Estimating program funding needs and potential funding scenarios;
- Piloting mandatory disaster risk home insurance in specific areas; and
- Gradual implementation of mandatory disaster risk home insurance for all required groups.

6. Evaluating and Scaling Up Climate Insurance Products:

Evaluate and adjust climate insurance products regarding premium prices, subsidy reduction plans, and bundling with sector-specific credit. The aim is to support climate-smart agriculture and encourage policyholders' risk reduction efforts.

7. Supporting ASP with Appropriate DRF Mechanisms:

Strengthen regulations related to DSP and PFB Disaster Pooling Fund (DPF) to support emergency social assistance funding. Steps include:

- Strengthening regulations for using BTT and village funds for emergency social assistance
- There is a need to develop studies on expanding social insurance mechanisms (BPJS Ketenagakerjaan and BPJS Kesehatan) to support disaster response.

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