Climate Resilience Alliance

Mercy Corps Indonesia

Policy Gap and Opportunity Analysis

PERMANENT COASTAL INUNDATION IN INDONESIA

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About this document

The Zurich Climate Resilience Alliance is a collaboration between humanitarian, NGO, research and private sector partners, working to build resilience to climate hazards in rural and urban contexts.

Formerly the Zurich Flood Resilience Alliance, we have over a decade of experience in generating evidence of communities' current levels of climate resilience and identifying appropriate solutions.

Through long-term community programmes, new research and stakeholder influencing, we strive to deliver systemic change at scale and realize our vision of a world in which communities are more resilient to climate hazards, and able to thrive.

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1. Executive Summary

Coastal inundation refers to the permanent sinking or inundation process of a dry land area.[1]As a slow-onset disaster, coastal inundation is not yet specifically governed by any regulation relating to disaster management in Indonesia. Whereas, such incidents cause significant damages and losses, even permanent ones, to the coastal communities, which impact settlements, health and educational public services, and economic activities of the vulnerable groups. Physical damages and disaster events in the future might impact the financial aspect (fiscal risk) due to the need for climate change adaptation actions that are incremental, transformative, and curative. As a record, IMF's studies revealed that additional funding needed for implementing adaptational activities costs 1% of the national GDP.[2] As a consequence, this will harm the fiscal and investment capacities due to the absence of assessment of the investment benefits of the coastal protection programs. Currently, there is no resource mobilization mechanism in the disaster management cycle at both national and subnational levels, and there is limited funding and financial support to protect from and respond to permanent coastal inundations. In short, coastal disasters are not covered yet in any policy framework and thus cause the government's slow response to such events.

This analysis reviews and portrays the landscape of the current policy supports in the permanent coastal inundation management, along with potentials for its improvement based on the current governance, recalling the complexity of climate change management, particularly in coastal areas, both technically and institutionally. The analysis also examines the interconnection between policies relating to climate change and environment, disaster management, development planning, budgeting, and spatial planning. The issue of permanent coastal inundation shall be a concern in the future planning of various policies, such as the Second NDC, and other global commitment documents on climate change, operationalization of the L&D framework along with its financing scheme, its integration into the disaster risk reduction and sustainable resilience frameworks, disaster mitigation financing strategy and policy, and in considerations regarding permanent coastal inundation management in the national development agenda.

Some of the existing relevant policies or technical regulations can be utilized, such as the one on slum settlement area management in the settlement sector, which has been used as a basis for relocating the Simonet villagers in Pekalongan Regency. The initiative was supported by the Special Allocation Fund from the Ministry of Public Works (MoPWPH) and Central Java Province's local budget, yet it is not covered under the disaster management framework, but rather under the regular development program implementation. The Government must formulate the appropriate policy and financing frameworks to respond to this event, based on climate change risk management and disaster management. The management strategy that should become the focus is the one to address physical and transition risks.

1 Flick, Reinhard E, et all. 2012. "Flooding" versus "inundation". Article in Eos Transactions American Geographycal Uni. September 2012. https://www.researchgate.net/publication/258626548

2 IMF. 2022. Macro-Fiscal Implications of Adaptation to Climate Change. https://www.elibrary.imf.org/view/journals/066/2022/002/article-A001-en.xml

Table 1 The Strategy to address permanent coastal inundation in Indonesia

Type of risk	Strategy	Relevant sector
Physical risk Chronic risk toward the physical environment, ecosystem, infrastructure assets, and social-cultural	Capacity building for adaptation through conservation of environment, ecosystem, biodiversity, and sectoral adaptation strategies	o Environment and climate change o Maritime, coast, and fisheries Other sectors, such as agriculture, health, housing, and settlement
	Capacity building for community adaptation, climate-resilient buildings or infrastructure, disaster mitigation and management	o Infrastructure, water resources, housing and settlement o Disaster mitigation
Transition risk Funding and fiscal risks regarding preventive and curative programs for permanent coastal inundation	Programs and financing to fulfil the public services in the relevant sectors	o Planning, budgeting, funding, and financing of development o Other sectors relating to economic activities and livelihood, such as social assistance, housing and settlement, agriculture, fishery, health, education
	Planning the zonation and priorities of coastal area development, regulation on changes of land tenurial status, and land consolidation and ownership	o Development planning o Spatial planning o Agrarian

Source: Author's analysis, 2024

Analysis of stakeholders of the permanent coastal inundation was conducted through the following steps: roles identification, relations between stakeholder groups, and analysis relating to responsibility, mandate, and broader interest that applies a dynamic analysis approach based on the institutions' roles, tasks and functions under their mandates, availability of laws and regulations, policies that cover the existing and future programs, as well as political will or leadership. The key institutions at the national level that play roles in managing this issue are, among others, the Ministry of National Development Planning/Bappenas, the Ministry of Environment and Forestry, the Ministry of Public Works and Housing, the Ministry of Home Affairs, and National Disaster Management Agency (BNPB). These five line ministries have the authority and strong intersectional tasks and functions in developing and implementing policies relating to permanent coastal inundation, namely the development of the National Long-Term Development Plan (RPJPN) and National Mid-Term Development Plan (RPJMN), allocation of development financing and fiscal transfer to subnational level, action plan for climate change adaptation and disaster risk reduction infrastructure development, and alignment of national development priorities to the subnational development.

In relation to policy advocacy, due to the current absence of any legal umbrella for permanent coastal inundation management, advocacy measures can be conducted within the development planning and budgeting framework through program advocacy and relevant development activities by referring to the technical guidances that are sensitive toward this issue. In the short term, there needs to be a co-agreed joint document between various stakeholders, such as a roadmap or action plan that can serve as a guide in managing the permanent coastal inundation issue. One of the options is to leverage the working group forum for land subsidence under the coordination of the Coordinating Ministry of Maritime Affairs and Investment, where the land subsidence issue still dominates the coastal inundation management on the Northern Coast of Java. Advocacy efforts need to prioritize the baseline information on climate change and permanent coastal inundation and its ensuing impacts so that they can be considered in the national development agenda priority.

2. Introduction

2.1 Background

Coastal flooding is an event that periodically occurs in coastal areas within a specific period, while coastal inundation refers to the sinking process or the inundation of a dry area permanently.[3]Permanent coastal inundations cause negative impacts on the community and economy. Permanent coastal inundation is one of the key hazards to the settlement, health and educational public services, and community's economic activity, particularly the vulnerable groups in the coastal areas. The rise in sea level caused by climate change further escalates the hazards, which will cause more severe impacts on the coastal community. In addition to the physical damages, the worsening disaster events and coastal inundation risks in the future will also impact the financial aspects of the transition or transformative action from the climate resilience perspective.

The emerging trend of disasters caused by climate variability as the implication of global climate change (e.g., extreme rainfall intensity and sea level rise) and non-climate factors (such as geological and anthropogenic factors) also contribute to the increasing risk of flood in the coastal areas. In the Greater Pekalongan Area, for example, the rate of land subsidence revolves around 0-34.5cm/year (with a median of 16.5 cm/year), which significantly affects the coastal flood risks, other than the extreme rainfall increase and change on the coastal characteristics - the rate of the land subsidence is significant compared to the land subsidence rate in Semarang, which reaches 15 cm/year.[4] The loss caused by floods in the Greater Pekalongan area is estimated to reach IDR1.55 trillion/year in 2020. The loss is expected to significantly increase by 2035 to IDR 31.28 trillion/year or twenty times the loss in 2020. The most significant material loss is visible in the adaptation and asset repair costs, declining income, and additional capital needed, while the most significant non-material loss is found in the declining productivity of agricultural and fishpond[5].

Such impacts are often seen after they have become irreversible or have achieved a significant (catastrophic) scale. The knowledge and practice of relocation (retreat) are rarely well managed, particularly ones associated with governance and preparation of supportive policies.[6] Various kinds of literature concluded that the root of complexity in implementing various coastal adaptation responses is related to the institutional and technical arrangement.[7] Thus, addressing this issue requires solid technical support and coordination among various stakeholders. The current challenges are caused mainly by the limited technology and knowledge, immensely diverse perspectives from various stakeholders, and the fact that permanent coastal inundation is not yet included as a type of disaster in Indonesia. This means that the disaster management cycle and resource mobilization mechanism cannot be implemented during permanent coastal inundation events. Furthermore, the existing disaster management cycle might not fit the slow-onset coastal inundation characteristics.

At the subnational level, the unclear policies have led to an inability to anticipate the risks and to reduce their impacts effectively. In some cases, the subnational governments must adjust with the existing policies and align their planning steps to address this problem. This not only inhibits any effective resource mobilization by the subnational governments but also significantly prolongs the time needed, which is a critical concern, as the impacts may get worse over time.

3 Flick, Reinhard E, et all. 2012. "Flooding" versus "inundation". Article in Eos Transactions American Geographycal Uni. September 2012. https://www.researchgate.net/publication/258626548

4 Mercy Corps Indonesia. 2022. Policy Brief, To Rise from Flood Impacts in Pekalongan: The Need for Transformative Policy. Working Paper, version 20 September 2022.

5 *ibid*

6 Lawrence, Judy et al. 2020. Implementing Pre-Emptive Managed Retreat: Constraint and Novel Insights. The Tropical Collection on Progress in the Solution Space of Climate Adaptation. https://doi.org/10.1007/s40641-020-00161-z

7 Lebbe, Théophile Bongarts. 2021. Designing Coastal Adaptation Strategies to Tackle Sea Level Rise. Policy and Practice Reviews, Frontiers in Marine Science. Doi: 10.3389/fmars.2021.740602

2.2 Problem statement

To respond to the risk of sea level rise and ensure coastal area protection from permanent inundation, comprehensive policies, and technical guidance are needed to address the coastal risks by involving various relevant actors at various levels of government, society, and the private sector. Currently, however, there is still no single well-coordinated and comprehensive policy or any technical guidance for the stakeholders, particularly for anticipating the risks, reducing the impacts, and managing the disasters effectively, for the permanent coastal inundation case, especially their physical and environmental impacts and impacts on the communities' livelihood.

2.3 Framework of analysis

The goal and scope of analysis in this study is to identify the existing policy gaps and opportunities relating to the permanent coastal inundation by portraying the current condition with regard to the policy landscapes and the involvement of various relevant stakeholders. The scope of aspect being analyzed in this study are the existing legislation, government's policies, technical guidelines, jurisdictions, and programs or initiatives. The framework of analysis in this study is as follows:

Identification of policies and actors' roles	Identification and analysis of multi-level governance	Gaps and opportunities analysis	Recommendations and moving forward
Method and output: o Desk study o Policy landscape and stakeholders involvement.	Method and output: o Desk study and interview o Challenge analysis and power-interest matrix	Metode dan Output: o Desk study o Physical risk, transition risk	o Desk study and interview o Physical risk, transition risk o Fiscal/financing; Adaptation and public service needs

Figure 1 Framework of Analysis

Source: Author's analysis, 2024

The policy development assumptions and strategies being used in the analysis can be seen on the following table:

Table 2 Analysis on the transmission of the permanent coastal inundation impacts and policy and program recommendations

Climate risk/L&D management regarding the negative impacts of the climate change	Disaster Management	Risks transmission	Impacts transmission (sector and fiscal)	The existing gaps and policy or program recommendations
Risk reduction	Prevention Mitigation Preparedness	Physical risk	Adaptation needs o Infrastructure resilience o Sectoral resilience o Community resilience	o Early warning system o Advanced monitoring technologies o Indigenous knowledge o Infrastructural measures o EbA/NbS
Risk retention	Preparedness	Transition risk	Public service o Social protection o Public education and health services o Community livelihood (agricultural, fishery economic activities) o Settlement, asset and land tenure status	o Social protection program o Cash-based social transfer scheme o Advanced technology o Regulatory improvement regarding permanent coastal inundation and spatial planning
Risk transfer	Transfer			o Index-based weather Insurance o State Asset (BMN) Insurance o Paddy Farm (AUTP) Insurance
	Emergency response and post-disaster		Status quo o Settlement, asset and land tenure status	o Regulations and programs for emergency response, rehabilitation and reconstruction, and recovery

Source: Author's analysis, 2024

3. Governance and Policy Analysis

3.1 The existing policy review at the national level

One of the climate change impacts is the sea level rise, which might bring further impacts on the extreme phenomenon in the coastal areas, such as the increase of sea tide, increase of the frequency of tidal flood and abrasion, permanent coastal inundation, decreasing coastal areas, and the sinking of smaller islands. The issue raised in this report is permanent coastal inundation, which causes significant losses to buildings and other critical infrastructures, harms communities' livelihoods, and causes loss of land ownership and land tenure rights. Reflecting on Indonesia's location and characteristics as a maritime country with long coastal lines, 10% of which are vulnerable, [8]and the numerous smaller islands, permanent coastal inundation might become a serious threat in the future. The average sea surface rise in Indonesian water has been 7.2 cm in the past 10 years, and the average sea surface is projected to rise up to 40 cm by 2050[9], which might cause the loss of lower coastal areas and smaller islands or permanent inundation. In addition, Indonesia is also faced with land subsidence problems, which may accelerate or increase the number of permanent coastal inundation cases.

In 2010, sea levels rose by 0.4 meters, resulting in the loss of 7,408 km^2 of land. It is estimated that in 2050, sea levels will rise by 0.56 meters, which will result in the loss of around 30,120 km^2 of land in Indonesia. Consequently, the islands in Indonesia are also predicted to disappear one by one. Based on Law No. 6/1996 concerning Indonesian Waters, the number of islands in Indonesia reaches 17,508. From 2005 to 2007, as many as 24 small islands in Indonesia were declared lost due to human actions or natural disasters.[10] And by 2100, it is estimated that Indonesia will lose 115 medium-sized islands spread from North Sumatra to West Papua Province.[11] Considering the potential threat to inhabited islands and the loss of outermost islands that form the country's borders, addressing this condition is urgent.

Coastal inundation events are mostly currently addressed by building beach protector infrastructures such as seawalls and population relocation if the inundated area cannot be reclaimed. However, more appropriate development planning is needed in the long term, as the permanent coastal inundation can further expand to other areas. The plausible strategy to anticipate the issue is climate change risk management. This aims to anticipate rising sea levels and spatial planning, which considers locations prone to permanent coastal inundations to avoid climate risks. Tidal floods and abrasion have been addressed through disaster management strategies, particularly focusing on repairing critical infrastructures damaged by abrasion and managing the displaced population. Disaster management can also serve as one of the strategies to address the permanent coastal inundation issue.

Currently, there is still no specific policy, strategy, or regulation governing the management of permanent coastal inundation. However, the issue can be addressed by adjusting the existing policies and regulations and preparing their technical derivative regulations. The existing policies can be utilized to integrate the permanent coastal inundation issue, namely the climate change and disaster management policies and strategies in national development and spatial planning. Therefore, reviews should be conducted on the national development policies associated with planning, budgeting, and spatial planning; climate change and environment; and disaster management to identify gaps and opportunities to address the permanent coastal inundation issue.

The mapping of the existing policies on coastal inundation can be seen in figure 1. The development planning and budgeting are governed by the Law on National Development Planning (Law 25/2004), spatial planning (Law 26/2007), and coastal area management (Law 1/2024), which have been derived into various regulations and technical implementation guidelines at the ministerial regulation level. The climate change development policies accommodate Indonesia's commitment to contribute to the global objective of emission reduction and climate resilience enhancement based on the ratification of the Paris Agreement (Law 16/2016). The climate change development policies are implemented in various line ministries'

8 Bappenas. 2018. Kajian Bahaya Iklim Sektor Pesisir dan Kelautan.

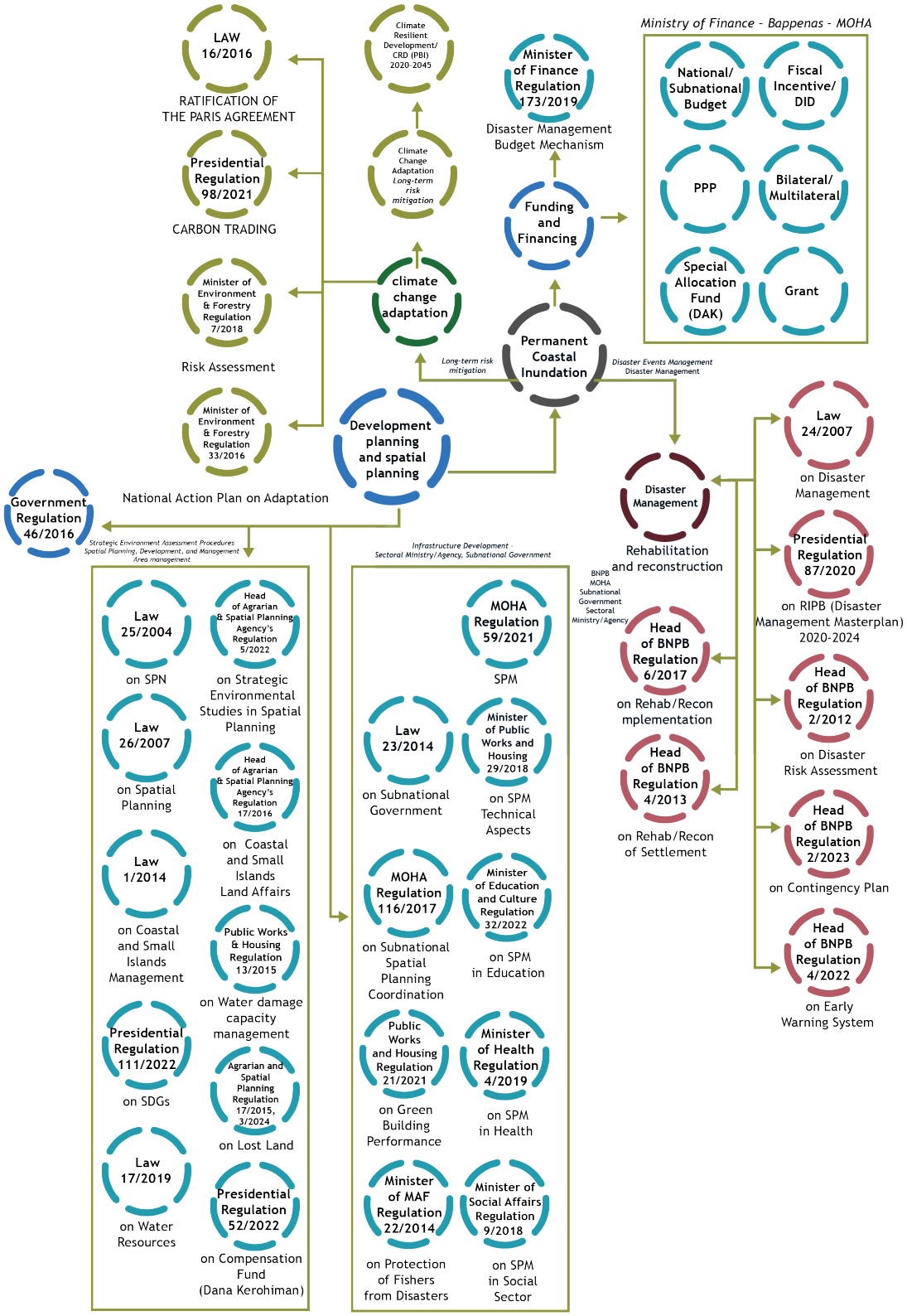
9 Kajian Perubahan Iklim Laut, Bappenas 2019

10 https://www.antaranews.com/berita/65557/selama-dua-tahun-24-pulau-kecil-di-indonesia-tenggelam#:~:text=Jakarta%20%28ANTARA%20News%29%20-%20Departemen%20Kelautan%20dan%20Perikanan,24%20pulau%20kecil%20di%20wilayah%20Indonesia%20telah%20tenggelam.

11 https://brin.go.id/press-release/119753/antisipasi-krisis-brin-kaji-dampak-perubahan-iklim-terhadap-sumber-daya-air

programs by referring to the low carbon and climate resilient development strategy and its technical implementing regulations/guidelines. Meanwhile, disaster management refers to the Law on Disaster Management (Law 24/2007). The technical implementation of disaster management is elaborated in the Head of the National Disaster Management Agency (BNPB)'s Regulation for technical matters relating to pre-disaster, emergency, and post-disaster management.

Figure 2 National Policies Landscape on Permanent Coastal Inundation



Source: Author's analysis, 2024

Review on the climate change and environmental policies

Issues relating to the environment, climate change, and disaster management are prioritized in the 6th National Priorities (PN) of the RPJMN of 2020-2024, aiming to develop the environment and increase disaster resilience and climate change. Climate change policies consist of low carbon development to reduce emissions and the long-term objective of net zero emission, while adaptation policies are implemented to anticipate the climate change impacts in priority sectors such as marine and coastal areas, agriculture, water resources, health, ecosystem, and disaster. By being listed as a priority in both the RPJMN and RPJPN, climate change management can be derived into sectoral strategies and workplans. The planning and development of climate change programs and activities are described in several national regulations, such as the Presidential Regulation (Perpres) on the Economic Value of Carbon (Presidential Regulation 98/2021).

Climate change threats in coastal areas include rising sea levels and increasing frequency of flood/inundation events. As specified in the Climate Resilient Development (PBI) Document, the threat is anticipated by improving the coastal ecosystem, coastal protection infrastructures, and zonation of the coastal areas that consider climate risks. However, specifically, there is no specific study on the sea level rise hazard i.e. permanent coastal inundation and its impacts, and thus, there is no strategy or action plan that can be directed to address the permanent coastal inundation issue. The preparation of the climate change impacts vulnerability analysis to the permanent coastal inundation, and its related adaptation planning can refer to the existing regulations, namely the Minister of Environment's Regulation 7/2018 on the Guidelines for Climate Risk Assessment and Minister of Environment's Regulation 33/2016 on the Development of the Climate Change Adaptation Action Plan and its integration into the Strategic Environmental Assessment (SEA/KLHS). The Presidential Regulation 73/2012 on the National Strategy for Mangrove Ecosystem Management and the Coordinating Minister of Economy's Regulation No. 4/2017 on Policies, Strategies, Programs, and Performance Indicators of the National Mangrove Management, stipulates the target to create a mangrove ecosystem covering 3.49 million hectares by 2045.

Review on disaster management policies

In the disaster management policy (Law 24/2007), disaster management is divided into 3 steps: 1) pre-disaster or preparedness, such as disaster risk assessment, contingency plan development, and capacity building for disaster mitigation; 2) disaster emergency response during disaster; and 3) post-disaster, in the form of rehabilitation and reconstruction of the disaster areas, and their recovery. The referred disasters are those caused by natural and non-natural factors that claim lives, damage the environment, cause loss of properties, and psychological impacts, such as earthquakes, tsunamis, floods, droughts, etc. Permanent coastal inundation is not one of the disasters being focused on in the current national disaster management plan, so there is no strategy or mitigation scheme that can be applied and is specific to address the risk of coastal inundation.

The disaster management regulation implementation has been derived into several technical regulations that serve as the guidelines to implement every phase of disaster management, including the Head of BNPB's Regulation 2/2012 on the Disaster Risk Assessment, Head of BNPB's Regulation 3/2022 on Early Warning Implementation, Head of BNPB's Regulation 6/2017 on the Implementation of Rehabilitation and Reconstruction in Post-Disaster, and Minister of Finance's Regulation 173/2019 on the Mechanism for Disaster Management Budget Implementation. In post-disaster recovery measures, the national and subnational governments must collaborate to repair critical infrastructures and essential services at the subnational level. In coastal inundation cases, as mentioned in the sectoral development review of the coastal area, the repair of water resource infrastructure in the inundated coastal area uses financing from the water resource programs of the Public Works. The infrastructure repairs in other sectors shall also be carried out in collaboration between the subnational governments and the ministries in charge of the essential service provisions in their respective sectors, such as transport, education, social and well-being, and housing and settlement.

Specifically for disaster management in coastal areas, there is Government Regulation (PP) Number 64 of 2010 concerning Disaster Mitigation in Coastal Areas and Small Islands which is an implementation of Law Number 27 of 2007 concerning Management of Coastal Areas and Small Islands. This PP requires coastal area management planning that includes disaster mitigation, including disasters such as earthquakes, tsunamis, floods, sea level rise, and coastal erosion, as part of the coastal management plan. This regulation emphasizes that mitigation efforts must be adjusted to the unique characteristics of coastal areas. Disaster mitigation regulated in PP 64/2010 includes physical activities such as coastal protection infrastructure development and ecosystem management, as well as non-physical activities such as community planning and

preparedness. The focus is on disasters that are typical of coastal areas, including slow onset events such as sea level rise and flooding, which require integrated and sustainable mitigation strategies.

However, because the PP does not refer to the Disaster Management Law, in its implementation, it has not been possible to directly coordinate, integrate, and access disaster management tools managed by BNPB, both in pre-disaster and post-disaster management.

Review on development planning, budgeting, and spatial planning policies

The national-level policies are implemented through development planning, sectoral strategies, and work plans of various line ministries. The national development priorities are specified in the long-term and mid-term development plan and further derived into the strategic plan and work plan of the relevant ministries and agencies, which execution is supported by the National Budget and other national funding sources, such as the cooperation with private sector and international donors (Law 25/2004 on the National Development Planning System). Based on the review of the RPJPN and RPJMN documents, there is currently no specific priority on permanent coastal inundation management, which in turn leads to the absence of any government strategies and programs aiming at anticipating and addressing the impacts of the permanent coastal inundation along with its budget allocation. However, environmental, disaster management and climate change have become the sixth national priority in the RPJMN 2020-2024.

With regard to spatial planning and use (according to Law 26/2007 on Spatial Planning), spatial planning is classified by the system, area function, administrative area, area activity, and the area's strategic values, all of which aim to create harmony with the natural environment, integrated utilization of the natural resources, and protection of the proper spatial functions. Locations that are prone to natural disasters such as volcanic eruptions, earthquakes, landslides, tidal waves, and floods, including the protection areas for which spatial use is limited for conservation purposes and reducing the natural disaster impacts. The permanent coastal inundation issue has not been discussed as a disaster that leads to restriction of spatial use, but rather as a flood and tidal wave-prone area that has been considered and can serve as a reference to develop strategies for permanent coastal inundation.

The national development planning also includes sectoral and area-based development that specifically focuses on marine and coastal areas, in which spatial use is governed by policies on coastal areas and small islands management (Law 27/2007). The coastal area management shall aim at conservation, rehabilitation, sustainable resource use, and improving the community's social and economic condition. The sectoral and coastal area development must be prioritized to develop adequate essential service infrastructures (Minister of Home Affairs Regulation 59/2021 regarding Minimum Services Standards/SPM) to support the coastal areas' economy, education, social, tourism, and disaster management. Currently, there is no strategy to anticipate permanent coastal inundation in place. However, there has been a program for coastal and marine areas and infrastructure zonation and development that aims to address inundation in the coastal areas or those suffering from prolonged tidal floods. Infrastructure improvement in the inundated regions is placed under the water resources in the development of the coastal areas and relocation of the settlement areas, a work that must be carried out as cooperation between the subnational governments and the Ministry of Public Works[12].

In areas with extensive disaster impacts, spatial planning and ownership of lost land are anticipated through the land loss policy.[13] **Land loss** is described as land that is permanently lost or changes function due to natural events such as earthquakes, abrasion, or floods, so that it does not meet the requirements as an object of land rights. Interested parties or government initiatives can submit applications for the determination of land loss to the Head of the local Land Office with supporting evidence. After the determination, land rights are removed and the land is returned to the state. Permen ATR 3/2024 simplifies this procedure by reducing the number of documents required and setting clear deadlines for each stage of the process. In addition, this regulation ensures transparency and provides an opportunity for stakeholders to file objections before the final decision. In relation to compensation for the condition of this destroyed land, Presidential Regulation Number 52 of 2022 concerning the *Dana Kerohiman* (Compensation Fund) states that all those with the status of land loss that are used for public interest are entitled to receive compensation funds amounting to 25% of the object's market value (NJOP). Compensation funds can also be given if the cause of the land loss is an event that is determined as a national disaster.[14]

12 The uninhabitable housing program, which is based on PUPR Ministerial Regulation 13/2016 concerning Self-Help Housing Stimulus Assistance, can be utilized by people with low incomes to own habitable houses, including people in coastal areas.

13 Permen ATR 17/2021 tentang Tata Cara Penetapan Tanah Musnah

14 Based on the Minister of Agrarian and Spatial Planning Regulation No. 17/2021 dan Minister of Agrarian and Spatial Planning Regulation No. 3/2024 on Procedure to Stipulate Land Loss

The land use of a land with the status of land loss, in which ownership is returned to the state, can be rearranged following government policy, including for National Strategic Areas. This plan must refer to the national and regional spatial plans and pay attention to public interests and environmental impacts. Plans for the changes of land functions must go through a licensing process and approval by relevant government agencies, such as the National Land Agency (BPN), the Ministry of Agrarian Affairs and Spatial Planning, and other planning institutions.[15]

3.2 Review on the policy development plan

The second NDC and other global commitment documents on climate change

The government strengthens its commitment to reducing carbon emissions in the forestry and land (FOLU), energy, waste, industry, and agriculture sectors. The enhanced commitment to emission reduction is pushing forward environmental preservation and more environment-friendly, nature-based development, including addressing the impacts of climate change. Nature-based Solutions (NbS) for area and ecosystem-based disaster and climate resilience are continuously implemented and developed following the emission reduction commitment specified in the NDC. The long-term strategy for low carbon and climate resilience[16] stipulates that other than the 2060 Net Zero Emission targets (or earlier), and climate resilience targets, the 2030 Net Sink FOLU targets must also be achieved in manners aligned with the NbS approach.

To complement the emission reduction commitment, Indonesia has prepared an NDC Adaptation Roadmap as a plan to address the impacts of climate change. This roadmap includes strategies for the Ecosystem, Food, Water, Energy, Health, and Disaster sectors, including coastal protection and hydrometeorological disasters. This document is submitted globally in the LTS-LCCR as an international commitment, and is used as a reference for adaptation programs by the government and related organizations. However, its implementation has not been legally regulated. Its national level implementation, in line in line with the national development targets in the RPJMN and RPJPN, a Climate Resilient Development policy has been prepared, which strategies and target descriptions are currently being updated. The differences in sectors outlined in the NDC adaptation and the Climate Resilient Development Policy are one of the challenges to align so that they can be a synergized reference for adaptation program planning.

Following the COP28 agreements in Dubai on the Global Goals on Adaptation and L&D funding potentials, Indonesia's Government is committed to enhancing the country's climate resilience covering the economic, social and livelihood, ecosystem, and landscape aspects. To achieve such targets, future development policies will be directed toward economic enhancement that considers environmental sustainability, climate change, and disaster impacts that align with the commitment to emission reduction and Nature-based Solutions (NbS).

Loss and Damage (L&D) Framework

The coastal area's inundation has caused significant damage and is estimated to increase further and cover wider areas across Indonesia. Coastal inundation is an unavoidable impact that can lead to various losses and damages; it is part of the excess impacts that will still occur despite all the climate change adaptation measures that might have been implemented. The existing adaptational measures are predominantly focused on several impacts of climate change. For example, the marine and coastal sector has not incorporated any assessment or effort to protect biodiversity. Poor management of slow-onset events such as permanent coastal inundation leads to various losses and damages to natural and environmental resources, as well as follow-up impacts on human beings.[17]

The L&D financing agreement targets countries that are prone to the climate crisis to address its impacts on the communities whose life and livelihoods are affected by long-term climate change. The L&D types that should be eligible for financing comprise economic and non-economic loss. Economic loss covers the loss of income from business operations, tourism, and physical assets such as infrastructure and properties. Meanwhile, non-economic losses comprise the life quality, health, and mobility of every individual, as well as communal losses that comprise areas, cultural heritage, indigenous people's knowledge, and social and cultural identities. In addition, the environmental losses that comprise the loss of ecosystem services and biodiversity are also part of this.

15 Permen ATR 37/2016 tentang Pedoman Penyusunan Rencana Tata Ruang Kawasan Strategis Provinsi dan Rencana Tata Ruang Kawasan Strategis Kabupaten

16 KLHK. 2021. Long-term Strategy Low Carbon and Climate Resilience Indonesia.

17 Mercy Corps Indonesia. 2023. Working paper: Kehilangan dan Kerusakan Akibat Perubahan Iklim di Indonesia

In the COP28 in Dubai, an L&D funding commitment was expressed, pledging USD700 million with the World Bank as the fund manager and distributor. However, there are no criteria regarding the requirements that make countries eligible for the fund.

Ideally, the L&D funding mechanism in Indonesia is aimed at hydrometeorology and slow-onset disasters, which are the impacts of climate change and might be able to finance climate resilience development. The L&D management fund for Indonesia will ease the burden of the state budget for managing the losses caused by climate disasters, which have become the priority in developing national climate resilience. The utilization of the L&D management fund can be directed, among others, to manage the permanent coastal inundation that is one of the long-term impacts of climate change and part of the slow-onset disaster.[18]

The National Mid-Term Development Plan (RPJMN) 2025-2029 and the Renewal of the Climate Resilient Development Policy

The National Long-Term Development Plan (RPJPN) 2025-2045 was developed to achieve the objective of Golden Indonesia 2045 as a Sovereign, Developed, and Sustainable Archipelagic Country, covering five visions and 8 missions or development agendas, 17 development directions, and 45 key development indicators. The decreasing intensity of greenhouse gas emissions toward net zero emission has been one of the five key targets or visions of the RPJPN. Climate change adaptation and disaster management have also been part of the 5th development agenda, i.e., Transformation of Social, Cultural, and Ecological Resilience, aligned with the 17th goal of development, which is Resilience toward Disaster and Climate Change.

Climate-resilient development aims to suppress the potential economic losses due to climate change, including looking at the policy direction in coastal and marine sector capacity building through various mitigation and adaptation efforts and capacity building of the stakeholders and communities. Meanwhile, disaster management is based on archipelago-based disaster characteristics and conditions that consider disaster risk reduction aspects in spatial planning development. The addressed disasters shall include the impacts of climate change on infrastructure development. Nature-based solutions can also be one of the priority policies in disaster management. The target of the indicator of the Proportion of Direct Economic Loss Due to Disaster relative to the GDP (%) is 0.11% by 2045, from the baseline of 0.14% in 2025.

By prioritizing this in the RPJPN 2025-2045, climate and disaster resilient development will be elaborated in the RPJMN and line ministries' strategic plans. At the subnational level, the alignment of the direction of RPJPN 2025-2045 with the provincial RPJMDs has been mandated through a Joint Circular of the Minister of Home Affairs and the Minister of National Development Planning/Head of Bappenas (SEB No. 1/2024). Hence RPJPD also needs to stipulate policies and derive the national development indicators into the subnational development, including the ones relating to climate and disaster resilience. In elaborating the strategies and policies in the RPJMN and RPJMD, permanent coastal inundation can be proposed as one of the key issues in the climate resilience in the coastal sector and disasters as a climate change impact. To accommodate this, the initial step could be integrating the permanent coastal inundation into the Climate Resilient Development policies.

The GoI has submitted the Indonesia's adaptation communication to the UNFCCC as a commitment to support the global goal on adaptation, which incorporates the priority sectors and adaptation activity programs to reduce the impacts of climate change. The report accommodates the climate change adaptation policy documents that have been published in Indonesia, such as the NDC Adaptation Roadmap, LTS-LCCR, Climate Resilient Development policies, and other relevant documents. At the national development planning level, the Climate Resilient Development policies will be renewed in accordance with the most recent development planning period, which is the RPJPN 2025-2045 and RPJMN 2025-2029.

The re-development of Bappenas's Climate Resilient Development policy shall be directed to determine the targets of the RPJMN 2025-2029, by delving more profound in the methodology to calculate the economic loss in every priority sector, such as by naming more climate-affected agricultural commodities and the category of vital objects affected by the sea level rise in coastal areas. The updating process can be an opportunity to incorporate the issues of permanent coastal inundation as one of the long-term impacts of climate change, particularly as targets until the end of RPJPN 2045.

18 In the implementation of the L&D financing mechanism, BNPB was appointed as the national contact point, and other related line ministries/agencies were divided into expert groups according to their respective fields, but there has been no decision regarding this matter.

Strategies and Policies for Disaster Mitigation Financing

Various innovative financing schemes have been developed to meet the needs for climate change and disaster management development to not overly burden the national budget, which still needs to be prioritized to fulfill the basic services and improve the national welfare. However, the management of climate change and disaster impacts is also an important item in supporting the success of national development and protecting society's interests. Funding allocated to the vulnerable and high-risk areas can be channeled through fiscal transfer to the priority regions, particularly for environmental and disaster management infrastructures.

Some innovative financing instruments that have been developed include the adaptive social protection (ASP) mechanism and the Disaster Risk Financing and Insurance (DRFI), which consists of a Standby Loan *(Pinjaman Siap Siaga)*, Disaster Pooling Fund, House Insurance, and State Asset Insurance.[19] The Government provides reserve fund allocation for disaster management in the National Budget with an average realization in 2012-2022 of IDR3,902.9 billion annually.[20]

1. An adequate and sustainable funding strategy for addressing disasters, consisting of (a) combining different financing instruments to obtain an efficient and effective financing scheme; (b) bearing/absorbing the risks for disasters that frequently occur or disasters with small losses through the national and/or subnational budget; (c) using contingency financing instruments as the complement to the national budget to bear the risks of medium to high loss disasters; (d) establishing a disaster pooling fund to strengthen the national budget's role, and (5) transferring risks through insurance for financing the rarely occurring but high loss disasters.
2. The financing priorities shall include the protection of State Assets (BMN), Local Government Asset (BMD) through risk transfer (insurance) over the state assets and local government assets with high economic values and benefits, public services, house protection for low-income communities (MBR), and society's social life.
3. The implementation and optimization of the risk transfer scheme such as agriculture insurance (Paddy Farm Insurance/AUTP), livestock business insurance, small fish culture insurance, and house insurance for low-income communities.
4. Improving disaster fiscal management and optimal and transparent fund distribution channels.
5. Promoting the involvement of local governments, the private sector, and the community in a broader financing scheme and the development of the domestic insurance market.

The implementation of adaptive social protection is suitable for reducing the impacts of hydrometeorological disaster on the most vulnerable communities. Any disaster event pronounced as a disaster by the local/national government can trigger the distribution of the ASP packages. Not only in cash transfer, ASP can also be developed in the form of provision of climate insurance premium payment and other instruments[21]. The adaptive social protection mechanism developed by the Ministry of National Development Planning/Bappenas has resulted in a roadmap for adaptive social protection implementation to increase the allocation and access to mitigation and disaster management funding, particularly the slow-onset, climate change-induced disasters[22]. Further development of such innovative funding mechanisms can be directed to fulfill the needs in managing permanent coastal inundation.

Relocation of the Disaster-Affected Communities

The permanent coastal inundation has forced the coastal communities to relocate their settlements as they are concerned about the potential inundation or because they have been affected by the permanent coastal inundation and lost their lands. Relocation requires funds and construction of rather large facilities, including acquiring land in the new location, construction of housing and settlement, health, education, transportation, economic, agricultural facilities, and other community business unit facilities. Socialization to the communities is often challenging due to the communities' reluctance to move to the new location. The communities expect to have a new location close to their original settlement so they can move on with the same livelihood.

19 Kementerian Keuangan. 2018. Strategi Pembiayaan dan Asuransi Risiko Bencana

20 Kementerian Keuangan. 2024. Nota Keuangan beserta RAPBN 2024.

21 Kajian Perkembangan Pengetahuan, Tata Kelola dan Kerangka Penanggulangan Kehilangan dan Kerusakan Akibat Perubahan Iklim di Indonesia, Mercy Corps Indonesia 2023

22 Currently, the operationalization of the ASP scheme has not been determined. For the slow onset event phenomenon in particular, aspects related to triggers, thresholds and determination of slow onset disaster status are challenges in developing the appropriate operationalization mechanism for the ASP scheme.

Regulation of the Head of BNPB No. 4/2013 regarding the Technical Guidance for Rehabilitation and Reconstruction in Post-Disaster for Settlement Sector stipulates that the recovery of the settlement/ permanent housings in the disaster-affected areas can be implemented in the disaster locations (by reclamation) or in the new location with the local government's policies. Local governments must also provide the relocation lands and facilitate the provision of the necessary settlement and disaster risk reduction infrastructures. However, since permanent coastal inundation is not yet included as a disaster category, the use of this regulation is limited to coastal settlements affected by tidal floods and abrasion. Although, the permanent coastal inundation events also impact the coastal community's relocation.

Meanwhile, referring to Law No. 23/2014 on Subnational Government, the arrangement of the people's housing is a mandatory affair and part of the Minimum Services Standards (SPM). The Local Government shall also implement the slum/slum house prevention programs, an activity aligned with the program's nomenclature as stipulated in the Minister of Home Affairs' Regulation No. 90/2019. The construction of new houses for the communities in a slum or disaster-affected areas through the Uninhabitable House Program (RTLH) or self-help housing stimulus assistance referring to the Minister of PUPR Regulation 13/2016.

To address the cost needed for relocation and the community's reluctance to relocate, other than using the *kerohiman* (compensation) fund given to the communities whose lands were taken over for public interests or conservation, and also the provision of housing development fund from the Uninhabitable House (RTLH) program. Afterwards, the community can relocate on its own. However, it might be limited if the permanent coastal inundation locations are rather broad. Cross-location relocation needs to be accepted by the affected community, which seeks safe lands not far from the coastal area. However, empty lands with such criteria barely exist in urban areas on Java Island. Such criteria might be found in rural areas on Java Island and outside Java. Therefore, the relocation of the climate change-affected community needs to be made as a national program. Lands with suitable quantity and quality need to be prepared to anticipate the need to relocate the communities affected by climate change, which number will further increase in the future.

3.3 The effectiveness of the existing policies in addressing the permanent coastal inundation issues

A study by the OECD regarding the responses against risks in coastal areas revealed that the sea level rise drove countries to focus on risk management that takes into account long-term conditions, financial incentives for adaptation, and one that ensures vulnerable communities' safety in coastal inundation strategies[23]. In the report, the coastal inundation management policies are implemented in 3 key strategies, namely:

1. protecting the coastal area for reducing threats through hard infrastructures and ecosystem rehabilitation;
2. reducing vulnerability with building designs that consider the sea level rise and provision of disaster emergency response; and
3. reducing exposure through spatial planning regulations and relocation of buildings and communities in permanent coastal inundation-prone areas.

Some of those strategies have been implemented in the existing national development policies, but **they are not yet effective** in addressing the threats of permanent coastal inundation.

The current policy context in responding the permanent coastal inundation:

- As part of the climate change adaptation and climate resilience management strategies, currently there is no technical guidance for risk assessment and adaptation options for coastal areas that is integrated into the spatial planning, disaster risk reduction (DRR), and land and land tenure issue approaches[24].
- The disaster risk management has not been integrated into spatial planning due to the lack of regulations at a technical level, guidance that can serve as a reference, and also the lack of disaster-related data and information, including the location distribution of a disaster event.
- Textually, the phrase tidal flood and permanent coastal inundation is not explicitly written as a type of disaster in Law 24/2007 on Disaster Management. The definition of flood and other disasters are not separated based on whether they are a slow-onset or rapid-onset type of disaster. However, in

23 OECD. 2019. Responding to Rising Seas: OECD Country Approaches to Tackling Coastal Risks, Coastal Risks. OECD Publishing, Paris, https://doi.org/10.1787/9789264312487-en

24 The Minister of Agrarian and Spatial Planning Regulation that has currently been implemented is relating to the integration of the Strategic Environmental Assessment (SEA) in spatial planning, and the impacts of climate change risks. A mechanism for Climate Change Adaptation integration that has been managed in Technical Guidance No. 5/2024

Government Regulation 64/2010 on Disaster Mitigation in Coastal Areas and Small Islands, tidal flood and permanent coastal inundation might be categorized as a coastal disaster.[25] Nonetheless, this PP does not refer to Law 24/2007, so this condition remains an issue in the context of disasters.

- The stipulation of disaster emergency status is considered unfit with the nature of permanent coastal inundation, a slow-onset risk or disaster.[26] Thus, rehabilitation and reconstruction policies are inapplicable, and no emergency responses indicate the actions or activities that must be conducted immediately during a disaster event to address its negative impacts. The permanent coastal inundation case cannot utilise the current Disaster Risk Assessment (DSA) on floods.
- If there is any directive on special zone stipulated by the Government, BNPB (National Disaster Management Agency) usually will follow the policies of its supervisory agency, such as the need to develop a DSA and disaster management strategy for national strategic tourism areas, or economic strategic area that are part of the National Strategic Projects (NSP). The threat of tidal flood must be considered in the spatial planning and area development plan policies as an impact of climate change and land subsidence, particularly in the northern area of Java coast and other areas prone to permanent coastal inundation.[27]Economically, moving forward, a Cost and Benefit Analysis (CBA) must be carried out on the permanent coastal inundation management to prevent additional fiscal risks and create new economic opportunities.
- Land tenure or rights that is lost due to permanent coastal inundation will be taken over by the state/ government through the inventorizing of land loss by the National Land Agency Office.[28] Based on the Basic Agrarian Law regarding the cancellation of a right to land, one of the causes of a right cancellation is the loss of land. The loss of land due to natural factors, such as abrasion, will not be compensated by the state unless the Government is proven to have not taken any preventive measures.[29] However, as long as no change in spatial function takes place, the community can still re-apply to use the land again, such as for fishponds and reclamation.[30]There is no remedy mechanism and/or compensation fund *(dana kerohiman)*[31], so long as theloss land is not repurposed into public construction and interest, such as the development of a conservation area or infrastructure development as part of a National Strategic Project (NSP).[32]However, the compensation fund *(dana kerohiman)* can be provided if the cause of the permanent coastal inundation is a national disaster, which requires the formal pronouncement of such an event as a national disaster.[33]
- Rehabilitation and reconstruction tend to focus on physical development. The disaster-affected communities often have difficulty recovering their social and economic condition, while the government's assistance and facilities for this are limited.
- Some of the accessible funding opportunities for permanent coastal inundation management is the L&D financing. However, there is not yet any solid mechanism and institutional arrangement regarding the implementation of the L&D financing framework if the permanent coastal inundation is made as part of the L&D[34].

The ineffective existing policies and regulations in managing permanent coastal inundation are caused by the absence of any directives to amend policies or develop new policies that focus on permanent coastal inundation, that can serve as a legal umbrella or policies that specifically mention the permanent coastal inundation at the national level, such as a roadmap or action plan. The absence of any legal umbrella or agreement for permanent coastal inundation management makes it difficult to allocate a specific budget to invest in anticipation of permanent coastal inundation. Currently, regulations and laws on climate change, disaster mitigation, and coastal area management have not been initiated nor changed to catch up with the threats of future permanent coastal inundation.

In accordance with the above explanation, the coastal inundation management strategies are divided

25 which is any event that is caused by natural events or man-made that causes changes in the coast's physical and/or biological nature that cause the loss of lives, property, and/or damage in the coastal area and smaller islands

26 The indicators to stipulate a disaster emergency status are: (1) number of victim; (2) property loss; (3) facilities and infrastructures damages, (4) size of the affected area, and (5) social-economic impacts it causes.

27 The Minister of Public Works and Housing Regulation 40/2007 on the Guideline for Spatial Planning in Coastal Reclamation Area highlights the importance of environmental considerations in spatial management in reclamation area. Specifically, there is no Minister of Agrarian and Spatial Planning Regulation regarding this matter.

28 23 The legal status of an abraded land will be dismissed, and the state is waived from any responsibility unless the government is proven to not have conducted any disaster mitigation measures.

29 Amrin, et. all. 2022. Status Hukum Hak atas Tanah yang Terkena Bencana Alam. Jurnal Tunas Agraria Vol. 5 No. 1, Jan 2022

30 Based on the Minister of Agrarian and Spatial Planning Regulation No. 17/2021 dan Minister of Agrarian and Spatial Planning Regulation No. 3/2024 on Procedure to Stipulate Land Loss

31 The awarding of the compensation fund (*dana kerohiman*) must be aligned with Presidential Regulation 52/2022 and Presidential Regulation 27/2023 on the Management of Social Community Impacts of Lost Land for Building for Public Interests, with the maximum amount of 25% of the object's market value.

32 National Strategic Project (NSP) 2020-2024: transportation, industrial zone, housing, dam and irrigation, clean water and sanitation, sea wall (Jakarta, West Java, Banten), energy, technology, education; program; electricity, economic distribution, development of border areas, national tourism strategic areas, waste to energy treatment facility, smelter, national food estate, economic development acceleration zone

33 Based on the Minister of Agrarian and Spatial Planning Regulation No. 17/2021 dan Minister of Agrarian and Spatial Planning Regulation No. 3/2024 on Procedure to Stipulate Land Loss

34 Neither is there any category regarding slow-onset climate change and disaster impacts that are part of the loss and damage.

into responses to address physical risks and transition risks or consequences incurred by the measures to implement new policies. This includes the anticipation of physical risks, namely capacity building for coastal area adaptation through hard infrastructure development and ecosystem-based infrastructure development (nature-based solution). Meanwhile, the emerging transition risks can be addressed by budgeting and spatial planning that is adjusted with the projected threats of permanent coastal inundation. The effectiveness of the existing policy implementation in the permanent coastal inundation issues, viewed from the policy implementation at the program level, is described in the following:

Table 3. The Mapping of Existing Policies in Anticipating the Permanent Coastal Inundation Risks

Type of risk	Strategy and Sector	Policy/Regulation	Limitations
Physical risk	Capacity building on adaptation through conservation of environment, ecosystem, biodiversity, and sectoral adaptation strategies. Related sectors: o Environment and climate change o Maritime, coast, and fisheries o Other sectors, such as agriculture, health, housing, and settlement	o Climate Resilient Development Policy o Law No. 16/2016 regarding the Ratification of Paris Agreement o Government Regulation No. 22/2021 regarding Environmental Protection Implementation o Presidential Regulation 111/2022 regarding SDGs o Presidential Regulation 98/2021 regarding The Economic Value of Carbon o Presidential Regulation 73/2012 regarding the National Strategies for Mangrove Ecosystem Management o Coordinating Minister of Economic Affairs' Regulation No. 4/2017 on Policies, Strategies, Programs, and Performance Indicators of the National Mangrove Management o MoEF's Regulation No. 7/2018 regarding the Guidelines to Implement the Climate Risk Assessment o MoEF's Regulation No. 33/2016 regarding the Development of Climate Change Adaptation Action Plan o MMAF's Regulation No. 23/2016 regarding the Planning of Coastal Areas and Small Islands Management	The rise in sea level can be anticipated by building soft beach protector infrastructures, namely the mangrove. However, this initiative is not yet optimally coordinated due to the different mangrove management areas between the MoEF and MMAF, as well as the absence of any legal umbrella for climate change actions that emphasizes the importance of mangrove planting and rehabilitation to address the impacts of climate change. The absence of any sectoral adaptation strategy, action plan, or investment that is based on the action priority assessment, particularly in the coastal areas.

Type of risk	Strategy and Sector	Policy/Regulation	Limitations
Physical risk	Capacity building for community adaptation, climate resilient building or infrastructure, disaster mitigation and management. Related sectors: o Infrastructure, water resources, housing and settlement o Disaster mitigation	o Disaster Management Policy o Law No. 24/2007 regarding Disaster Management o Government Regulation No. 21/2008 regarding Disaster Management Implementation o Government Regulation No.64/2010 regarding Disaster Mitigation in Coastal Areas and Small Islands o Government Regulation No. 2/2018 regarding Minimum Services Standards o Presidential Regulation No. 87/2020 regarding the Disaster Management Masterplan 2020-2044 o Minister of Home Affairs Regulation No. 27/2007 regarding the Guidelines to Prepare the Facilities and Infrastructures for Disaster Management o Minister of Home Affairs Regulation No. 49/2021 regarding the Minimum Services Standards Implementation o Minister of Public Works and Housing's Regulation 13/2015 regarding the Disaster Emergency Response due to the Damaging Property of Water o Head of the National Disaster Management Agency (BNPB)'s Regulation No. 1/2008 regarding the Procedures to Implement Disaster Management and Its Derivatives o Head of BNPB's Regulation 4//2013 regarding the Technical Guidance for Post-Disaster Rehabilitation and Reconstruction in Settlement Sector	The development of hard infrastructures for coastal protection has been conducted in vulnerable coastal areas, but they have not projected the impacts of permanent coastal inundation in the future. Furthermore, it is also due to the absence of any guidance for implementation or technical guidance for climate-resilient infrastructure and maladaptation potentials. The adaptation capacities in technical and technological aspects, human resources, and community knowledge.

Type of risk	Strategy and Sector	Policy/Regulation	Limitations
Transition risk	Programs and financing to fulfil public services in the relevant sectors Related sectors: o Planning, budgeting, funding, and financing of development o Other sectors relating to economic activities and livelihood, such as social assistance, housing and settlement, agriculture, fishery, health, education	o Law No. 25/2004 regarding the National Development Planning System o Law 23/2014 regarding Subnational Government o Government Regulation No. 46/2016 regarding the Procedures to Implement the Strategic Environmental Assessment (SEA/ KLHS) o Presidential Regulation No. 27/2023 regarding Amendment of Presidential Regulation No. 52/2022 regarding the Response to Social Impacts of the Lands Identified as Land Loss for Public Interests o Presidential Regulation 98/2021 regarding the Economic Value of Carbon o Minister of Home Affairs Regulation No. 49/2021 regarding the Minimum Services Standards Implementation o Minister of Public Works and Housing's Regulation No. 13/2015 regarding the Disaster Emergency Response due to the Damaging Property of Water o Minister of Public Works and Housing's Regulation No. 13/2016 regarding Self-Help Housing Stimulus o Minister of Finance's Regulation No. 173/2019 regarding the Mechanism to Implement Disaster Management Budget o Minister of Marine Affairs and Fisheries Regulation No. 23/2016 regarding the Planning of Coastal Areas and Small Islands Management	o Both climate change and disaster management strategies need specifically allocated funds so that they will not affect the national budget allocation for basic services development. Area recovery in post-permanent coastal inundation and population relocation also requires a specific budget, including compensating vthe land rights and land ownership, socio-economic rehabilitation of the affected communities, by pronouncing the permanent coastal inundation as a national disaster event. o The specific funding and financing mechanisms for permanent coastal inundation are unavailable. Further study is needed regarding the currently most suitable disaster mitigation financing scheme. o The rather slow 'slow-onset' disaster management due to the limited institutional capacity and policies

Type of risk	Strategy and Sector	Policy/Regulation	Limitations
Transition risk	Plannings on zonation and priorities of coastal area development, regulations for changing the land rights status, as well as land consolidation and ownership Related sectors: Development planning and spatial planning, and agrarian	o Law No. 26/2007 regarding Spatial Planning o Law No. 27/2007 regarding the Planning of Coastal Areas and Small Islands Management o Minister of Home Affairs Regulation No. 116/2017 regarding the Subnational Spatial Planning Coordination o Minister of Agrarian and Spatial Planning Regulation No. 08/2016 regarding the Services for Transferring Certain Building Rights in Certain Areas o Minister of Agrarian and Spatial Planning Regulation No. 17/2016 regarding Land Management in Coastal Areas and Small Islands o Minister of Agrarian and Spatial Planning Regulation No. 5/2022 regarding the Procedures to Integrate the Strategic Environmental Assessment into the Spatial Planning o MMAF's Regulation No. 25/2021 regarding Integrated Studies and Stipulation of the Change of Core Zone Status in Conservation Areas o Minister of Agrarian and Spatial Planning's Regulation 17/2021 and Minister of Agrarian and Spatial Planning's Regulation 3/2024 regarding the Procedures to Stipulate Land Loss; Presidential Regulation 52/2022 regarding the Management of Social Impacts from Land Loss	o As climate change impacts such as permanent coastal inundation are local, spatial planning is critical to reduce the risks incurred by inundation. The current spatial planning does not integrate the priority areas affected by climate change and the projection of future climate risks. The absence of any regulation that mandates such an integration is one of the barriers. o The areas identified as land loss will lose their tenurial rights and use rights if the owners do not apply for repair and reclamation. A compensation fund *(dana kerohiman)* can only be given if the government takes over the lost land for public interest purposes.

Source: Author's analysis, 2024

A legal umbrella or a roadmap that will serve as the pathway to integrate the permanent coastal inundation into the national and subnational government's work programs can be developed by further developing the existing policies and regulations to make them able to address the physical and transition risks. Among the existing policies are those related to disaster mitigation, climate change and environment, spatial planning, the development of the coastal area sector, etc. For example, by developing derivative regulations from the Disaster Management Law, Paris Agreement Ratification Law, and Coastal Area Management Law. Presidential and ministerial regulations of the related sectors derived from such laws may include technical guidelines and implementing guidance for ministries/agencies and local governments to develop their work programs and allocate budgets for permanent coastal inundation management.

3.4 Gap Analysis and Opportunities for Policy Development related to Permanent Coastal Inundation at the National Level

To be prioritized in the national development and aligned with subnational development, the permanent coastal inundation issue must be supported by comprehensive studies comprising the projected threats or hazards, vulnerabilities, risks, targets, and the action plan to address them. A legal umbrella that can be the basis for permanent coastal inundation policies is also needed to integrate such policies into development activities. Gap and opportunities analysis on the national policies and regulations to be further developed to address the permanent coastal inundation issues is shown in Table 2.

Table 4 Gap and Opportunities Analysis on National Policies for Permanent Coastal Inundation Management

Policy/Regulation	Gap	Opportunity
Planning, budgeting, and spatial planning: o Law No. 25/2004 regarding the National Development Planning System o Law No. 26/2007 regarding Spatial Planning o Law No. 27/2007 regarding the Planning of Coastal Areas and Smaller Islands Management o Law 23/2014 regarding Subnational Government o Law 1/2011 regarding Uninhabitable House o Law No. 23/2014 regarding Subnational Development o Presidential Regulation 111/2022 regarding SDGs o Presidential Regulation No. 52/2022 regarding the Response to Social Impacts of the Lands Identified as Lost Lands for Public Interests	o The national development priorities and SDGs have not considered the threat of permanent coastal inundation. o The guidelines to develop the Strategic Environmental Assessment in the national development plan does not specifically mention about the need for making a projection of permanent coastal inundation to analyze the environmental support and carrying capacities o Local critical infrastructures planning, spatial planning, and development, as well as the limitation of the coastal land ownership and use, have not considered the projection of permanent coastal inundation.	o Pursuant to the national development planning law, if the permanent coastal inundation is pronounced as a national priority, it can be included into sectoral strategies and ministries/agencies' plans, which will enable them to tap into the national budget. It can be part of: o Climate change and environmental management o Disaster management o Sectoral development in coastal areas o Climate change and disaster management has become part of the SDG 13 which is mandatory to be prioritized in the national and subnational development.

Policy/Regulation	Gap	Opportunity
o Presidential Regulation No. 27/2023 regarding Amendment of Presidential Regulation 52/2022 o Government Regulation No. 2//2018 regarding Minimum Services Standards o Government Regulation No. 46/2016 regarding the Procedures to Implement the Strategic Environmental Assessment (SEA/KLHS) o Minister of Home Affairs Regulation No. 49/2021 regarding the Minimum Services Standards Implementation o Minister of Home Affairs Regulation No. 116/2017 regarding the Subnational Spatial Planning Coordination o Minister of Public Works and Housing No.13/2016 regarding Self-help Housing Stimulus o Minister of Agrarian and Spatial Planning Regulation No. 5/2022 regarding the Procedures to Integrate Strategic Environmental Assessment (SEA) into Spatial Planning	o The lack of regulations that limit the land use causes the society not having full awareness to avoid the vulnerable coastal areas when building their houses or businesses. o The coastal inundation/tidal flood issue can be addressed through rehabilitation and relocation of the settlement areas, which currently doesn't have yet any specific allocation, and therefore still needs other budget allocations or to wait for national programs. o Subnational governments must provide the lands and facilitate the settlement relocation. The limited subnational fund has made relocation difficult to implement and therefore still relies on national government programs. One of the allocated sources of fund is the uninhabitable house program, but to address the wider inundated areas, there needs to be considerations to make a special program at the national level.	o The projection of permanent coastal inundation vulnerability can be included in the SEA analysis on the carrying capacity and load capacity of the vulnerable coastal areas. o Other than including the permanent coastal inundation into the development priority, permanent coastal inundation-prone areas must also be governed in the spatial planning, e.g. by pronouncing them as protection or conservation areas. o Building permits and land ownership granted to the community can include the requirements to avoid areas projected to be prone to permanent coastal inundation.

Policy/Regulation	Gap	Opportunity
o Minister of Agrarian and Spatial Planning Regulation No. 08/2016 regarding the Services for Transferring Certain Building Rights in Certain Areas o Minister of Agrarian and Spatial Planning Regulation No. 17/2016 on Land Management in Coastal Areas and Smaller Islands o Minister of Agrarian and Spatial Planning's Regulation 17/2021 and Minister of Agrarian and Spatial Planning's Regulation 3/2024 regarding the Procedures to Stipulate Land Loss; Presidential Regulation 52/2022 regarding the Management of Social Impacts from Land Loss o MMAF's Regulation No. 23/2016 regarding the Planning of Coastal Areas and Small Islands Management o MMAF's Regulation No. 25/2021 regarding Integrated Studies and Stipulation of the Change of Core Zone Status in Conservation Areas	o The limited detailed and reliable data and information regarding climate change, frequency, and intensity of disasters, location distribution, and the impacts or losses caused by the disasters o Different perceptions among stakeholders and the absence of integration of guidelines for climate change, spatial planning, and disasters	o Permanent coastal inundation can be one of the subnational performance indicators in environmental and disaster management sector, so that local budget can be allocated to support this purpose. o Minimum services standards can be added with the obligation to build coastal conservation or protection structures/buildings that must be built in vulnerable coastal areas and smaller islands. o Proposing a budget allocation for the permanent coastal inundation program in the local environmental special allocation fund (DAK) and performance incentive regarding climate change, environment, and disaster. o Relocation areas must be immediately prepared to anticipate the permanent coastal inundation impacts that will expand in the future. Relocation can also immediately be started for areas that are more severely impacted by tidal flood and abrasion.

Policy/Regulation	Gap	Opportunity
Climate change: o Law No. 16/2016 regarding the Ratification of Paris Agreement o Presidential Regulation 98/2021 regarding the Implementation of Economic Value of Carbon o Law No. 22/2021 regarding Environmental Protection Implementation o NDC and Low Carbon and Climate Resilience Long-Term Strategy 2050 o Climate Resilient Development Policy (CRD/PBI) o Coordinating Minister of Economic Affairs' Regulation No. 4/2017 on Policies, Strategies, Programs, and Performance Indicators of the National Mangrove Management o MoEF's Regulation No. 7/2018 regarding the Guidelines to Implement The Climate Risk Assessment	o The planting and recovery of mangrove forest for emission reduce has not been thoroughly explored in the NDC and LTS-LCCR strategies, while Indonesia's mangrove carbon reserve is around 3.14 ~ 3.41 billion tons. o Studies on hazards and economic losses caused by climate change impacts in coastal areas have incorporated the coastal inundation threats to coastal buildings and environment, but have not comprehensively specified the permanent coastal inundation. o The existing legal umbrella and implementing guidelines on climate change are still too general and not yet focused on the sectoral issues.	o The potential of Blue Carbon on the coastal area and sea to be included in the FOLU (mangrove forest) sector toward net zero emission. Mangrove forests and lands are part of the carbon reserve enhancement sector. o Blue carbon projects can be developed as part of the REDD+ result-based payment financing and carbon tax mechanism that focuses on the mangrove forest. o The long-term climate resilience strategy needs to discuss more comprehensively about the permanent coastal inundation (the projection of permanent coastal inundation and their locations, risk assessment, and its anticipative strategies) o Technical derivative regulations can be developed to implement strategies to anticipate permanent coastal inundation, such as those based on the needs stipulated in the Presidential Regulation on Carbon Pricing for mangrove forest management.
o MoEF's Regulation No. 33/2016 regarding the Development of Climate Change Adaptation Action Plan o Specific Funding for Climate Change Programs: result-based payment and carbon tax mechanism	o Different perceptions among stakeholders and the absence of integration of guidelines for climate change, spatial planning, and disasters. For example, for policy reference on climate change adaptation, there are NDC adaptation roadmap and PBI policy that have different definitions of adaptation sectors (for example, the coastal marine sector in PBI with ecosystem and landscape resilience containing aspects of coastal protection in the adaptation NDC). As a result, those policies' implementation and corresponding role division are different from one to another.	o Alignment of policy documents at the national level is needed to better facilitate line ministries in dividing roles and responsibilities in matters related to addressing climate change and permanent coastal inundation (part of coastal and marine or ecosystem sector, or both). o Sectoral climate change targets and action plans must be developed to ease every sectoral ministry and subnational offices in developing their adaptation work programs. o The formulation of climate change adaptation strategy should consider transformative actions that must be carried out when the climate change impacts are quite extensive and massive, for instance, in the case of permanent coastal inundation that necessitates the relocation of settlements in the affected coastal area. In this case, it can be discussed under disaster management context.

Policy/Regulation	Gap	Opportunity
Disaster management: Regulations related to disaster management: o Law No. 24/2007 regarding Disaster Management o Presidential Regulation No. 87/2020 regarding the Disaster Management Masterplan 2020-2044 o Government Regulation No. 21/2008 regarding Disaster Management Implementation o Government Regulation No. 64/2010 regarding Disaster Mitigation in Coastal Areas and Small Islands o Minister of Finance's Regulation No. 173/2019 regarding the Mechanism to Implement Disaster Management Budget o Minister of Home Affairs Regulation No. 27/2007 regarding the Guidelines to Prepare the Facilities and Infrastructures for Disaster Management o Minister of Public Works and People's Housing's Regulation 13/2015 regarding the Disaster Emergency Response due to the Damaging Property of Water o Head of the National Disaster Management Agency (BNPB)'s Regulation No. 1/2008 regarding the Procedures to Implement Disaster Management and Its Derivatives regarding Pre-Disaster, Emergency Response, and Post-Disaster Management.	o There is not yet any study or research regarding permanent coastal inundation that projects the impacted locations and the entailing risks. o The permanent coastal inundation has not been specifically addressed in the disaster management, but is part of the tidal flood management in coastal areas. o The disaster management cycle (pre-disaster, emergency response, and post-disaster) and its budgeting have not addressed permanent coastal inundation, because it is not yet considered as a disaster category. Hence, stipulating slow onset disaster status, including the permanent coastal inundation, is rather difficult. o The existing specific regulation regarding disaster mitigation in coastal areas and small islands has not yet regulated permanent coastal inundation mitigation in a detailed manner. o The absence of specific regulations for managing permanent coastal inundation under the disaster management framework leads to limited funding access, despite the significant need for evacuation, rehabilitation, and relocation efforts.	o Permanent coastal inundation can be added into the disaster vulnerability and risk analysis. For example, it can be put in the climate change adaptation convergence and disaster risk reduction within the slow-onset disaster hazard category. o There needs to be technical guidances for implementing disaster management specifically for permanent coastal inundation at pre-disaster phase (contingency plan), emergency management (infrastructure improvement and relocation), and post-disaster (impacted locations recovery). o The technical guidance for managing permanent coastal inundation can be the detailing of Government Regulation 64/2010, namely in terms of infrastructure development, early warning, preparedness and evacuation measures for areas affected by permanent coastal inundation. o Strengthening the cross-sectoral coordination in the permanent coastal inundation management, namely public works, health, education, coastal, marine, tourism, social, and SMEs.

Policy/Regulation	Gap	Opportunity
o Head of BNPB's Regulation 4//2013 regardnig the Technical Guidance for Post-Disaster Rehabilitation and Reconstruction in Settlement Sector	o Relocation that can be carried out in disaster-affected areas and where lands are lost due to disasters. The provision of relocation lands and facilities is the responsibility of the subnational government. However, the locations affected by the coastal inundation that are eligible to access the facilities remain limited to those affected by tidal flood, not the permanent and wide-scale inundation. In addition, the subnational governments also have limited resources to provide significant amount of land and facilities.	o The Ministry of Finance/BKF has initiated a disaster risk insurance and financing strategy (PARB), which can be further developed for coastal inundation management. The potential for permanent coastal inundation to be included in this strategy is large, due to the nature of slow onset disasters which future vulnerabilities and risks can be predicted (can be measured). However, efforts to unlock the position of permanent coastal inundation in the disaster category need to be a precondition for this. o The implementation of social adaptive protection roadmap to fund programs for permanent coastal inundation anticipation. o The initiative of climate change adaptation (CCA) - disaster risk reduction (DRR) convergence has been initiated since 2016, which can be further followed up by leveraging the issue of permanent coastal inundation[35]. o A new concept, 'Sustainable Resilience', promoted by the BNPB seeks to integrate the CCA-DRR-SDGs context. This concept can be the initial hook to reactivate the CCA-DRR convergence discussion while also opening up dialogue on financing for permanent coastal inundation management.

35 KLHK. 2017. Konvergensi Adaptasi Perubahan Iklim dan Pengurangan Risiko Bencana (API-PRB). Jakarta: Direktorat Adaptasi Perubahan Iklim. https://muspera.menlhk.go.id/Perpus_search/detail/25489

Policy/Regulation	Gap	Opportunity
		o Another kind of CCA-DRR integration is the Adaptive Social Protection and Loss and Damage (L&D). An adaptive social protection (ASP) roadmap has been developed to ease the CCA-DRR planning and budgeting. o The relocation program for the communities impacted by the permanent coastal inundation must be a national program due to the numerous affected communities and requires significant land procurement and cost. Vertical houses can be an alternative for the relocated settlement, yet consideration must be given to the community's acceptance and their livelihood in the new location (social engineering).

Source: Author's analysis, 2024

4. Stakeholders analysis

4.1 Stakeholders identification, analysis, and mapping

Permanent coastal inundation management has become a concern in the Climate Resilient Development Policy (CRD/PBI), particularly focusing on addressing the impacts of sea level rise. This is also a priority in the marine and coastal sectors' environmental and climate change development, which is carried out through the protection of the ecosystem and coastal areas. As a slow-onset disaster, permanent coastal inundation management has not been prioritized in the disaster management sector, but various preventive and emergency response measures have been conducted, including by improvement of coastal infrastructures for addressing the tidal flood and beach abrasion.

The roles of institutions in developing and implementing the existing regulations on permanent coastal inundation management have been mapped based on the development planning and budgeting cluster; policy implementation supports cluster, environment and climate change cluster, disaster management cluster, and coastal sector development cluster.

Table 5 The Mapping of Stakeholders in Permanent Coastal Inundation Management

Institution	Role
Development planning, budgeting, and spatial planning cluster	
Ministry of National Development Planning/ Bappenas	o Developing the National Long-Term Development Plan (RPJPN) and National Mid-Term Development Plan (RPJMN), which are the key reference for line ministries/ agencies' programs and activities. These should be aligned with the subnational development plans documents, namely the Subnational Long-Term Development Plan (RPJPD) and the Subnational Mid-Term Development Plan (RPJMD). o Ensuring the implementation of sectoral development and SDGs o Governing the use of Special Allocation Fund (DAK) and public-private partnership (PPP) o Developing the development implementation guidance: SDGs, Low Carbon Development, CRD (PBI), Disaster Management Action Plan, Adaptive Social Protection Roadmap
Ministry of Finance	Managing and arranging the national budget allocation for sectoral development, climate change development, and disaster management. In addition, they are also responsible for developing the financing mechanism and strategies: o Financing strategies and disaster risk insurance o Subnational fund transfer (Special Allocation Fund/DAK, subnational performance fiscal incentive, infrastructure fiscal incentive for the "3T" regions) o The Environmental Fund Management Agency (environment, climate change, pooling fund) o Bond/sukuk (Islamic bond) for environment, climate change, disaster (non-existent) o SMV: PT. SMI, IIF, the Implementation of ESG Principles in the Public Private Partnership (PPP) Climate and disaster resilient infrastructures.
Ministry of Home Affairs	o Coordinating and facilitating subnational development assistance, ensuring the subnational governments' performance, and implementing the Minimum Services Standards (SPM). o Facilitating the alignment of national and subnational development in specific issues such as environment and climate change, SDGs, etc.
Ministry of Agrarian Affairs and Spatial Planning/ National Land Agency (ATR/ BPN).	o Developing a spatial plan and area management plan through Spatial Planning (RTRW) and Detailed Spatial Plan (RDTR) documents, land acquisition, spatial use control, land control, and land issues responses. o In controlling the use of space and developing the RTRW, the Ministry of MASP/Land Agency (BPN) shall consider the disaster and climate change vulnerability and risks, including the importance of integrating the Strategic Environmental Assessment (SEA/KLHS) into the RTRW.

Institution	Role
Policy implementation support cluster	
Coordinating Ministry of Maritime Affairs and Investment (Kemenko Marves/CMMAI)	o Steering the sectoral ministries to implement policies relating to maritime affairs and investment. Ensuring the implementation of transport development programs (trans roads), priority tourist destinations, national strategic centers, post-disaster recovery, critical riverbanks, strengthening of marine security, and other special zones (such as areas prone to permanent coastal inundation). o The CMMAI might encourage the issuance of Presidential Instructions (Inpres) regarding such issues. For example, the Presidential Instruction on Biodiversity with the MoEF.
Coordinating Ministry of Human and Cultural Development (Kemenko PMK/ CMHCD)	o Coordinating human and cultural development affairs, including their related infrastructures, which are carried out by 8 technical ministries (Ministry of Education and Culture, Ministry of Health, Ministry of Research and Technology, Ministry of Women Empowerment and Child Protection (MWECP), Ministry of Social Affairs (MOSA), Ministry of Youth and Sports (MOYS), Ministry of Religious Affairs (MORA), and Ministry of Villages, Disadvantaged Regions and Transmigration (MOVDRAT). o Disaster management and assistance to disaster victims are also the responsibility of the CMHCD with BNPB.
Environment and climate change cluster	
Ministry of Environment and Forestry (MOEF)	o Being the UNFCCC focal point for climate change management in Indonesia, both in mitigation and adaptation, coordinating and issuing directives and technical guidance for climate change issues (NDC, LTS-LCCR, SIDIK), and ensuring NDC implementation. o The MOEF also plays a role in the preservation of land and coastal ecosystems, including the mangrove ecosystem in forest areas and riverbanks.
Relevant sectoral ministries/ agencies	Other ministries and agencies that are involved in environmental and climate change management, particularly in mitigation and climate change adaptations, are the Ministry of Marine Affairs and Fisheries and the Ministry of Agriculture.
Disaster management cluster	
National Disaster Management Agency (BNPB)	o The coordination of disaster management implementation starts from the pre-disaster management (preparedness), during a disaster (emergency response), and post-disaster (reconstruction and rehabilitation). o In formulating the preparedness plan, BNPB develops the area disaster risk and vulnerability assessment, the Disaster Management Masterplan (RIPB), early warning system, etc. o In post-disaster management, BNPB coordinates with the relevant sectoral ministries/agencies to rebuild the infrastructures, relocate, and provide social recovery for the affected communities, etc.
Relevant sectoral ministries/ agencies	o Other ministries and agencies are also involved in disaster management, such as in emergency response: rehabilitation and reconstruction of transport facilities, housing and settlement, and other public facilities. o These include: MPWH, Ministry of Transportation, MOSA, MOEC, MOH, MMAF, MOAA/ National Land Agency
Coastal sector development cluster	
Ministry of Marine and Fisheries (MMAF)	o The supervision and control of the coastal areas and smaller islands and protection and allocation of coastal areas. o Protection and rehabilitation of coastal ecosystems, including mangrove and seagrass beds. o The reconstruction and rehabilitation of public facilities in the marine and fishery sector and the management of fisher villages, including the relocation from the disaster and climate change-prone areas.

Institution	Role
Ministry of Public Works and People's Housing (MOPWPH)	o National strategic infrastructure development, such as transportation, housing and settlement, sanitation and drinking water, and water resources. o Construction of drainage infrastructures and beach protectors become part of the development in the water resources sector. o The management of emergency responses, reconstruction, and rehabilitation of the disaster-affected coastal infrastructures, such as keeping the roads functional, fixing the roads, normalization of rivers, and constructing dams to anticipate floods.
Ministry of Education and Culture (MOEC) Kemendikbud	Development of educational facilities and infrastructures, including in coastal areas
Ministry of Health (MOH)	Development of health facilities and infrastructures, including in coastal areas
Ministry of Social Affairs (MOSA)	Distribution of social assistance and improvement of the community's well-being in the coastal areas

Source: Author's analysis, 2024

Other than ministries/agencies, other institutions that play roles in coastal area development, including in the environment, climate change, and disaster management sectors, are the academics (in research and community facilitation), NGOs (facilitation and advocacy), and development partners.

The key actors at the national level are the Ministry of National Development Planning/Bappenas, MOEF, MOHA, MOPWPH, and BNPB. These key actors were selected based on their respective authorities in policy development and the sectors they are responsible for. The structure is presented in the following graph:

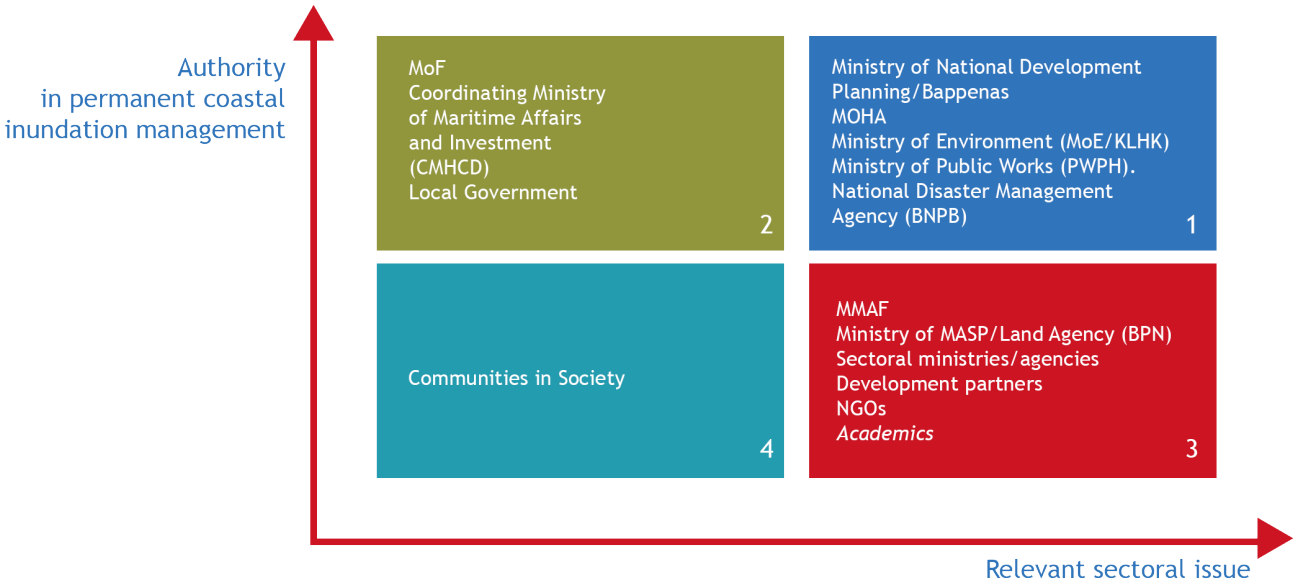


Image 3 Power-Interest Analysis of the Key Actors in Permanent Coastal Inundation Management

Source: Author's analysis, 2024

The institutions in Quadrant 1 have strong authority and interest in the coastal areas' development and permanent coastal inundation issues. The ministries/agencies that are part of Quadrant 1 are the key actors in permanent coastal inundation management, including the Ministry of National Development Planning/Bappenas and MOHA. Both play significant roles in developing and aligning national development priorities in coastal areas, climate change, and disaster sectors. In addition, MOHA plays a critical role as the coordinator of subnational governments to ensure the success of subnational development. As a focal point, the MOEF is important in coordinating climate change management measures. The MOPWPH acts as the executor of infrastructure development, while BNPB acts as the coordinator of disaster management. The following is the detailed mapping of the technical directorates in every key actor in Quadrant 1 that can provide a general description of their respective tasks, functions, and authorities.

Table 6 Technical Directorates Relating to the Permanent Coastal Inundation Management

Ministry/Agency	Technical Directorates
Ministry of National Development Planning (Bappenas)	o Directorate of Environment o Directorate of Spatial Planning and Disaster o Directorate of Marine Affairs and Fisheries o Directorate of Housing and Settlement o Directorate of Water Resources o Directorate of Forestry and Water Resources Conservation o Directorate of Poverty Alleviation and Community Empowerment
Ministry of Home Affairs (MOHA)	o Directorate of Synchronization of Subnational Government Affairs I o Directorate of Synchronization of Subnational Government Affairs II
Ministry of Environment (MOE)	o Directorate of Climate Change Adaptation o Directorate of Inland Water and Mangrove Rehabilitation o Directorate of Land and Water Conservation
Ministry of Public Works (PWPH).	o Center for National Area Infrastructures Development o Directorate of System and Strategy for Water Resources Management o Directorate of Rivers and Beaches o Directorate of System and Strategy for Road and Bridge Implementation o Directorate of System and Strategy for Housing Implementation o Directorate of System and Strategy for Settlement Infrastructures Implementation o Directorate of Settlement Area Development o Directorate of Drinking Water o Directorate of Sanitation o Directorate of Building Development
National Disaster Management Agency (BNPB)	o Directorate of Disaster Risk Mapping and Evaluation o Directorate of Disaster Management Strategy Development o Directorate of Rehabilitation and Reconstruction Planning o Directorate of Physical Recovery and Improvement o Directorate of Social Economic and Natural Resources Recovery and Improvement

Source: Author's analysis, 2024

The institutions mentioned in the Quadrant 2 are those that have strong authority in budget allocation and coordinating the implementation of cross-sectoral and subnational policies. However, their interest in this issue is relatively low due to the absence of any legal umbrella regarding the permanent coastal inundation and disaster issues. Quadrant 3 is a sectoral development implementation group. In this regard, communities play roles in supporting the implementation of policies and regulations, including the ones relating to spatial management of settlement area.

The status quo institution in Quadrant 1 refers to the mandate of the respective agency. The permanent coastal inundation issue, which is part of the priorities in climate change and disaster management, offers the following advantages and disadvantages in accordance with the status quo of the respective institution:

Table 7 Advantages and Disadvantages Losses based on Status Quo of Key Actors in Permanent Coastal Inundation

Institution	Status quo	Advantages/Disadvantages
Bappenas	Increasing the program allocation and financing for permanent coastal inundation	o Potential additional program and budget allocation for climate change management (MoEF) and disaster (BNPB), but there will be a reduction in program/budget allocation in other sectors in accordance with the national budget capacity. o Potential additional financing from a third party (donor/private sector) because it becomes part of the development priorities. o Additional fiscal transfer allocation to the subnational governments through the environment Special Allocation Fund (DAK) or a new DAK can be established specifically for permanent coastal inundation.
MoEF	Environmental and sectoral adaptation strategy	o Permanent coastal inundation as a climate change adaptation action strategy can assist in reducing disaster mitigation measures. o The implementation of permanent coastal inundation adaptation is eligible to access climate change funding.
MoHA	Subnational government's development performance	o Permanent coastal inundation strategies, such as environmental development, can be one of the subnational development indicators, which can make it easier to adopt in the local government units' (OPD) programs and activities. o However, facilitation and assistance for the subnational governments are critical, particularly in regions with limited resources and funding.
Ministry of Public Works and Housing	Construction of water resources, transportation, housing, and settlement infrastructures	o The permanent coastal inundation adaptation programs can be part of the infrastructure development in the sectors of climate change adaptive water resources, transportation, and settlement o In post-disaster recovery, infrastructure development in the permanent coastal inundation-affected areas can also be a priority
BNPB	Disaster management strategies and funding	o Development programs for permanent coastal inundation anticipation are eligible to access disaster management funding sources o Leverage BNPB's roles in coordinating the sectoral ministries, subnational governments, and other supporting agencies in disaster management, including in the development of pre-disaster assessment. o The roles of BNPB in disaster risk mitigation include strengthening the disaster database system, early warning, preparedness and community awareness raising, disaster management institutions, and conducting disaster vulnerability and risk assessment (InaRisk and IRBI).

Source: Author's analysis, 2024

4.2 Dynamic stakeholders analysis

The national institutions' roles are dynamically determined by the changes of regulations and policies that specifically govern their roles in this context, particularly the ones relating to the possible change in government structure and ministry/agency's nomenclature (structure) in the new administration of 2025-2029. With regard to this matter, the involvement of various stakeholders relating to the permanent coastal inundation issue will lead to (a) the change of importance of stakeholders and their involvement on one hand, and (b) the change of nature of interaction between stakeholders during the adoption process on the other hand.

According to the institutional roles and interests, some agencies have the authority in the development planning and budgeting, spatial planning; sectoral agencies that implement the development policy strategies; agencies responsible for coordinating the subnational development implementation, as well as agencies responsible for sectoral development implementation at the subnational level. However, in the implementation, there are frequent biases and different interpretations, and duplication of development policies and strategies that lead to disintegrated and disharmonious policies or regulations, which end up in confusion in the implementation of such policies. Such conditions could only occur without clear regulations regarding the distribution of roles and interests between agencies in handling certain issues and the lack of coordination between agencies and agencies' leadership in developing policies.

For instance, in the existing climate change adaptation management context, there are differences in the policy strategies developed by Bappenas with that of the MoEF, which resulted in the creation of 2 separate documents, namely the Climate Resilient Development Policy (PBI) and NDC Adaptation Roadmap, which substances are not aligned with each other. This has led to confusion among the sectoral ministries and subnational governments in developing their adaptation programs and policies, particularly regarding to which document they should refer (either Bappenas's PBI, or Adaptation NDC Roadmap), and how to align the substances of both documents. It is described in the following table:

Table 8 Analysis of the Real Condition of the Dynamics in Climate Change Adaptation Policies

Institution	Policy or Regulation	Issues in implementation
Kementerian PPN/ Bappenas	Climate Resilient Development Policy (CRD/ PBI)	o No clear legal umbrella that governs the policy implementation at the national and subnational levels. Currently, they only use the Presidential Regulation regarding RPJMN 2020-2024 as a reference in developing ministerial strategies and work plans that are linked to the national development priorities. o At the subnational level, they only adhere to the needs for aligning the subnational with the national development priorities. There is no obligation to refer to the CRD/Climate Resilient Development (PBI) document in developing the Strategic Environmental Assessment and spatial planning. o There is not yet any explanation agreed by and coordinated between various agencies regarding the relations between the PBI document with other climate change policies such as NDC and NAPs. o For a wider policy implementation, there need to be robust implementing regulations that clarify the interconnection between the CRD (PBI) documents with the others and the need for the CRD (PBI) document to serve as the basis for developing sectoral strategies and work plans, subnational development policies, and spatial planning.
MoEF	Adaptation NDC Road Map	o The Adaptation NDC document should serve as a document that communicates the commitment of the national climate change adaptation to the global level. This document can be a reference for developing programs to anticipate climate change impacts, which aligns with the period of the NDC Adaptation Roadmap. o On the other hand, the misalignment of sectors and target directions between the NDC and PBI documents creates ambiguous references for Ministries/Institutions. Not only that, communication related to CCA to the domestic and global levels is also not synchronised. o There is no clarity on the positioning of the NAPs document between the NDC and PBI documents, while this NAPs document should act as a reference for domestic action that will be communicated as a national commitment to the global level. o The studies that become the basis for NDC result from collaboration between various sectoral institutions, including research institutions. The lack of communication and discussion between agencies in developing the NDC assessment caused confusion, and other agencies were unaware of the results. o The NDC Adaptation Roadmap presents all the climate change performance indicators, as well as policy and program commitments that are not yet aligned with the national development and sectoral strategies, which make it difficult to be integrated into the ministerial/institutional program and activity development (not optimally used). o Inter-agency coordination must be agreed on and governed by clear regulations, particularly in developing policy documents and determining each document's role (both CRD/PBI and NDC) in the development of ministries/agencies and subnational governments' programs and activities.

Source: Author's analysis, 2024

In permanent coastal inundation management, we need to at least refer to the national (and subnational) institutions that are responsible for development issues as mandated by the existing legislation, including those relating to environment and climate change; disaster management; marine affairs, coastal area and smaller islands management; spatial planning, water resources, human settlement, and agrarian affairs; national development planning and funding; and subnational government affairs and public services.

Currently, permanent coastal inundation is not considered a type of disaster, and as a consequence, there is not yet any programmatic planning for its management in coastal areas, either at national or subnational levels. Capacity building for subnational government institutions in charge of public services in the coastal areas must be strengthened, including those relating to the status quo housing and settlement services, such as developing technical guidance and implementing guidance for housing and settlement development and land ownership. In the case of permanent coastal inundation in Pekalongan Regency, the Pekalongan Regency Government and the Provincial Government of Central Java aim to fill out the gap by maximising the fulfillment of public services by referring to certain Minimum Services Standards (SPM); in this case, the SPM in public housing that is governed in the Minister of Public Works's Regulation No. 29/2018 regarding SPM Technical Standards in the context of relocation for the affected communities.

The existing coordination mechanism for permanent coastal inundation management is organic, without any formal platform, and on an ad hoc basis in certain areas or sectors. This is because there is not yet any specific regulation or policy that governs the management of permanent coastal inundation at national and subnational levels. For example, the initiative by the Pekalongan Regency's Housing, Settlement and Environmental Agency to relocate the affected coastal communities in Simonet Village, which aims to fulfill the SPM requirements for decent housing and settlement areas for poor people. Moving forward, there needs to be a comprehensive action plan on social engineering after the relocation. The following is the organic coordination practice involving various stakeholders for the relocation process of the coastal inundation-affected villagers of Simonet Village, Pekalongan Regency.

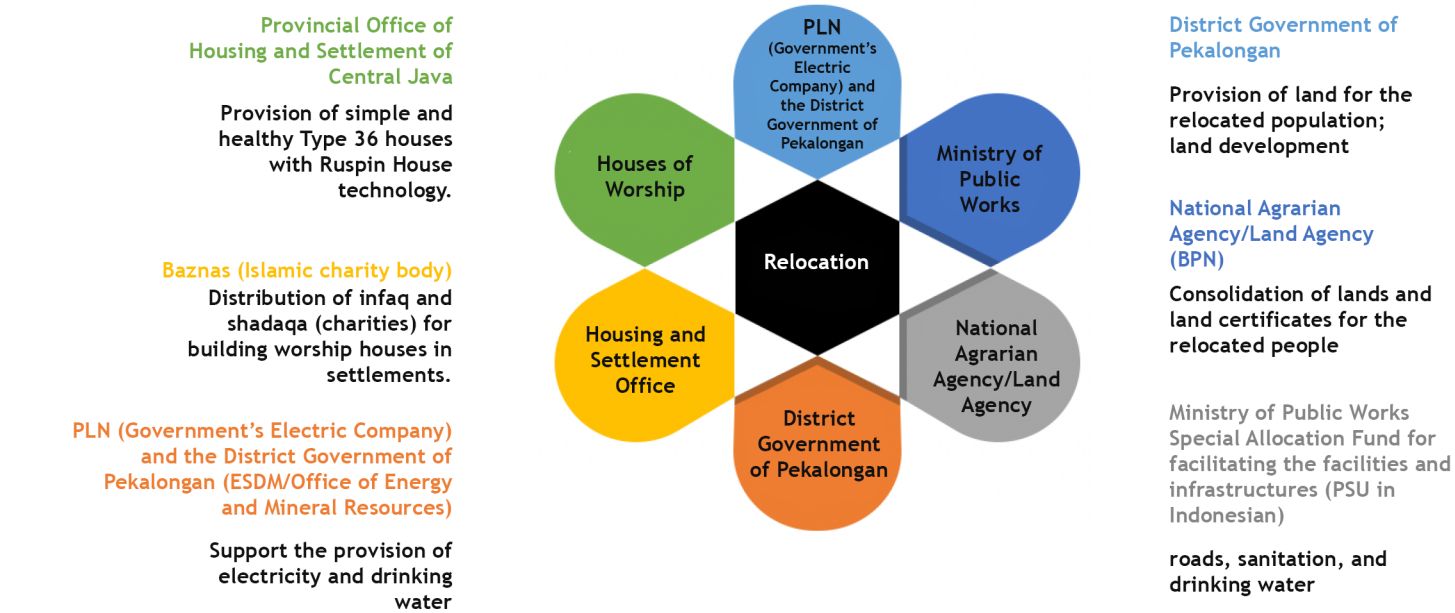


Image 4 Stakeholders Collaboration in the Relocation of Simonet Villagers

Source: Adopted from discussion materials with the Semarang City Government, 2024

The organic coordination mechanism highly relies on the level of interests of various stakeholders (including their political will and leadership) and the availability of laws and regulations, and policies that can secure the implementation of the program/activity and other relevant ministerial/agencies' key tasks and functions.

Dynamic factors:

1. The institutional roles, tasks, and functions in accordance with their mandates
2. The availability of the laws, regulations, and activities that secure the existing and future programs
3. Political will and leadership

As explained above, the assumptions built in dealing with permanent coastal inundation and climate change, in general, are due to the existing biases and different ministries/agencies' interpretations of their authorities in managing climate change and disaster issues. There are functions that could be optimally performed with proper coordination. This dynamic analysis captures the conditions and opportunities to improve coordination functions, involved sectors, and line ministries.

Table 9 Dynamic Stakeholders Analysis in Permanent Coastal Inundation Management

Type of risk	Coordination function	Sector	Ministry/Agency
Physical risk	Coordinating capacity building for adaptation through conservation of environment, ecosystem, biodiversity, and sectoral adaptation strategies	o Environment and climate change o Maritime, coast, and fisheries o Other sectors, such as agriculture, health, housing, and settlement	o Coordinating Ministry of Maritime Affairs and Investment o MoEF o MMAF o Other relevant sectoral ministries/ agencies
	Coordinating capacity building for community adaptation, climate-resilient buildings or infrastructure, disaster mitigation and management	o Infrastructure, water resources, housing and settlement o Disaster mitigation	o MPWH o National Disaster Management Agency (BNPB)

Transition risk	Coordinating programs and financing to fulfill the public services in the relevant sectors	o Planning, budgeting, funding, and financing of development o Other sectors relating to economic activities and livelihood, such as social assistance, housing and settlement, agriculture, fishery, health, education	o Bappenas o MoF o MoHA o Kemensos o Local government o Other relevant sectoral ministries/ agencies
	Coordinating the planning of the zonation and priorities of coastal area development, regulation on changes of land tenurial status, and land consolidation and ownership	Development planning and spatial planning, and agrarian	o Ministry of MASP/Land Agency (BPN); o Bappenas o MMAF o MoHA o Local government

Source: Author's analysis, 2024

5. Conclusion

5.1 Review of Governance and Policies

a. Based on the reviews of the existing policies and regulations, the climate change impact responses remain one of the priorities in national development and global commitment, yet they are still limited by the lack of a legal umbrella and technical regulations for their implementation at the national and subnational level. In the policy context, the analysis of vulnerability, climate risk, and permanent coastal inundation are not yet included as part of the considerations. There is no action plan or activity program specifically addressing the permanent coastal inundation.

b. Meanwhile, in disaster management, the legal umbrella and technical policy implementation regulations have been developed to address pre-disaster until post-disaster phases. Nevertheless, permanent coastal inundation has not been one of the disaster categories managed. Hence, it cannot be addressed in accordance with the disaster management regulations, unless they are temporary coastal inundations or tidal floods.

c. The integration of climate change impacts and disaster risks into the spatial planning remains minimal, which leads to discrepancy between the spatial planning and the coastal area protection, with the potential loss of the tenurial right and land use rights caused by abrasion and high-level permanent coastal inundation. The existing governance of rights to lost lands does not favor land owners, particularly individual owners, and for land uses other than for business purposes, such as housing and settlement.

d. With regard to funding and financing, permanent coastal inundation management might utilize the innovative adaptive social protection instrument, disaster risk financing and insurance, which consists of on-call loan *(pinjaman siap siaga)*, disaster pooling fund, house insurance, and State Asset (BMN) insurance. However, a review on the definition of permanent coastal inundation under disaster criteria needs to be conducted, to ensure that it is eligible to use the disaster management reserve fund in the national budget.

e. To respond to the policy and regulatory gaps in addressing permanent coastal inundation, there are several opportunities for developing future policies, including by leveraging the existing policy modalities, and various strategies that will be developed regarding climate change and disaster management, such as climate change adaptation commitment in the NDC as well as climate resilient development policies, convergence of CCA-DRR, sustainable resilience, L&D mechanism, adaptive social protection, and integration of CCA-DRR into the spatial planning. It

is also important to develop a roadmap to adjust various regulations and policies so that they can be used to address the permanent coastal inundation issue. As a technical guideline, the roadmap can integrate various work programs with budget allocation for addressing permanent coastal inundation at subnational level.

5.2 Review of Stakeholders Roles

a. The institutions playing roles in developing and implementing policies on permanent coastal inundation are divided into national and subnational ones, which are in charge of the development affairs. This has been specifically regulated in the current legislation, including those on environment and climate change; disaster management; marine, coastal, and smaller islands management; spatial planning, water resources, human settlements, and agrarian affairs; planning and funding of national development; and local government affairs and public services. The review conducted identified 5 national institutions that might become the key actors in addressing permanent coastal inundation, namely the Ministry of National Development Planning/Bappenas, Ministry of Home Affairs (MOHA), Ministry of Environment and Forestry (MoEF), Ministry of Public Works (PWPH), and the National Disaster Management Agency (BNPB).

b. The five line ministries/agency have the authority and strong intersectional tasks and functions in developing and implementing policies relating to permanent coastal inundation, namely the development of the National Long-Term Development Plan (RPJPN) and National Mid-Term Development Plan (RPJMN), allocation of development financing and fiscal transfer

to subnational level, action plan for climate change adaptation and disaster risk reduction infrastructure development, and alignment of national development priorities to the subnational development.

c. Dynamically, the roles of the national level institutions are influenced by changes in regulations and policies relating to the institutional mandates, availability of laws and regulations, as well as political will and leadership at the subnational level. Reflecting on the Pekalongan Refency case, the Regional Secretary led the advocacy of the Simonet Village relocation program through multistakeholder horizontal and vertical coordination.

d. Currently, permanent coastal inundation is addressed through capacity building for local government's public services in coastal areas, including with the existing housing and settlement services status quo, such as by developing the technical guidance and constructing housing and settlement areas and land ownership.

e. The existing coordination mechanism for permanent coastal inundation management is organic, without any formal platform, and on an ad hoc basis in certain areas or sectors. The coordination practice among the stakeholders in the case of Simonet villagers' relocation from the coastal areas was based on the fulfilment of minimum services standards (SPM) in the settlement and decent housing sectors for the poor.

6. Recommendations

Based on the reviews conducted on the existing policies and their effectiveness, as well as the multi stakeholders' roles in addressing permanent coastal inundation, policies that can be considered to address the physical and transition risks incurred by permanent coastal inundation are as follows:

1. Integration into climate change policies

   Climate change policies have incorporated the threat of sea surface rise and its implications on the damages of coastal infrastructures, inundation, the loss of coastal areas, and the sinking of small islands. Through climate resilience policies, it would be more possible to incorporate the permanent coastal inundation issue as a long-term impact of the sea surface rise. The step to integrate permanent coastal inundation into climate change adaptation policies can be done through:

   a. Studies on climate risks and the impact of inundation in coastal areas to identify priority locations.

   b. Evaluating the financial and environmental impacts of the coastal flood to identify suitable adaptation targets and strategies

   c. Developing integrated coastal strategies and action plans to address the coastal inundation, which include beach protection infrastructures, ecosystem rehabilitation, coastal area zonation, and community capacity building

   d. Inter-ministerial and stakeholders coordination; developing an action plan that elaborates the programs and activities to support the climate resilience priorities in the national development plan. In addition, regulations and guidance are needed to ensure its effective implementation.

2. Integration in the disaster management policies

   Labelling permanent coastal inundation as a type of disaster as abrasion and tidal flood, yet long term, will open access to disaster management financing for permanent coastal inundation management. Furthermore, it will also ease the stakeholder coordination between national and subnational governments in accordance with the technical regulations on disaster mitigation. The steps to integrate the permanent coastal inundation into disaster management are as follows:

   a. Conducting vulnerability and disaster risk assessment on permanent coastal inundation to identify the permanent coastal inundation-prone locations. This step can be carried out together with the analysis of climate-prone locations (by taking the results of the projection of the climate change impacts on permanent coastal inundation).

   b. Developing a disaster contingency and readiness plan in the permanent coastal inundation-prone areas, and conducting socialisation to the community.

c. Formulating an emergency response roadmap or strategy for existing permanent coastal inundation area, which includes rehabilitation and reconstruction of damaged buildings and relocation of affected communities whose settlements are no longer habitable (land loss). The roadmap also needs to address the preparation of emergency funds for the management, division of roles in rebuilding, and coordination.

d. Coordinating the emergency responses and recovery of the permanent coastal inundation areas with the local government, BPBD, and relevant ministries in the post-disaster recovery, such as in rehabilitation, reconstruction, and relocation of settlements affected by permanent coastal inundation.

e. Developing a Head of BNPB's regulation regarding anticipatory measures, emergency responses and post-disaster rehabilitation for permanent coastal inundation events in highly vulnerable areas. The availability of such regulation will facilitate planning and funding for permanent coastal inundation management activities within the spatial plan and disaster management plan in coastal area, by also considering the mandate of Government Regulation No. 64/2010.

f. Reviewing the CCA-DRR convergence plan that can be utilised as a reference to develop a mechanism to manage the long-term impacts of climate change and also slow onset event, particularly by focusing on the permanent coastal inundation. This can be done by exploring the sustainable resilience concept that can be fostered to address climate risk and hazards related to slow onset events in activities related to pre-disaster policies, including disaster insurance and disaster bonds[36].

g. Land provision for community with unhabitable house due to permanent coastal inundation is a critical step to enhance the community's quality of life. However, the implementation of this program requires strong collaboration between the national and subnational government[37], particularly in terms of land provision and also the construction of settlement facilities. This can be coordinated by referring to the Minister of Public Works and Housing Regulation No. 13/2016 regarding Self-help Housing Stimulus which is the basis for the Unhabitable House Program and Head of BNPB's Regulation related to post-disaster rehabilitation and reconstruction.

3. Development planning, budgeting, and spatial planning

An important point to implement the strategy for anticipating permanent coastal inundation is by prioritizing it in the national development plan to obtain the allocation of the National Budget to implement its associated programs and construction activities. The steps to integrate permanent coastal inundation into development planning, budgeting, and spatial planning are:

a. Assessing the priorities to address coastal flood and permanent coastal inundation by utilizing the climate projection and evaluating associated disaster risks.

b. The strategy to address the coastal flood and permanent coastal inundation must be prioritized in developing climate resilience and disaster management, including spatial planning, particularly the spatial management in the marine and coastal sectors, such as economic activities, settlement, conservation areas, etc.

c. Adjust the technical regulations and guidelines for planning and budgeting, and coordinate with the MOHA regarding the minimum service standards (SPM) for the associated sectors in the vulnerable areas.

d. Exploring loss and damage funding scheme for permanent coastal inundation management by considering the need to prepare a disaster risk analysis framework and also area protection and recovery, which is needed specifically for the event.

e. Developing specific financing mechanism such as permanent coastal inundation risk insurance or direct cash transfer to accommodate emergency response financing in settlement or business sector at risk of permanent coastal inundation (rehabilitation, reconstruction, and relocation).

36 Sustainable Resilience or Resiliensi Berkelanjutan is a framework and platform for multi-stakeholder collaboration to promote convergence and alignment related to the Paris Agreement on Climate Change, the Sendai Framework on Disaster Risk Resilience, and the Sustainable Development Goals. Concept and Implementation Strategy of the Bali Agenda for Resilience, Bappenas Final Report 2022

37 The Cooperation described in this regulation is still limited to the Subnational Government that identifies communities that need stimulus for the construction of habitable houses and PUPR as the provider of stimulus assistance for the construction of houses.

The following is the proposed L&D financing policy framework based on a risk and financial management approach related to sea level rise that causes permanent coastal inundation and impacts physical and socio-economic conditions:

Table10 L&D financing policy framework for permanent coastal inundation

Risk management	Financing	Model
Coastal defense, ecosystem-based adaptation, insurance, coral reefs restoration	o National/Subnational Budget o ODA L&D track o Climate resilient bond	Incremental
Well-managed retreat, planned livelihood transformation	o Risk pooling and transfer, including catastrophe risk and insurance o Catastrophe and attribution bond o Adaptive social protection scheme o Disaster management fund	Transformative
Forced retreat and forced livelihood transformation	o Global and national loss distribution mechanism o Adaptive social protection scheme	Curative

Source: Adopted from IIASA 2021

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