Ministry of National Development Planning/Bappenas

# CLIMATE RESILIENCE DEVELOPMENT POLICY (2025–2045) 2.0

EXECUTIVE SUMMARY

Ministry of National Development Planning/Bappenas. 2025

# CLIMATE RESILIENCE DEVELOPMENT POLICY (2025–2045) 2.0

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# **CONTRIBUTORS** TO THE DEVELOPMENT OF CLIMATE RESILIENT DEVELOPMENT POLICY DOCUMENTS (PBI)

The preparation of this document involved a wide range of stakeholders and leveraged scientific studies provided by multidisciplinary experts. Key contributions include:

**Meteorology, Climatology, and Geophysical Agency (BMKG)**

Through the Climate Change Information Center, BMKG provides observational data and atmospheric climate projections, particularly regarding changes in precipitation and temperature. These forward-looking data form a critical foundation for formulating national strategies and policies related to climate resilience.

**Ministries and Agencies (K/L)**

The Climate Resilience Development 2.0 document refers to various data and information provided by Ministries and Agencies. These datasets are compiled from relevant Directorates or Technical Units, including:

- Ministry of Finance
- Ministry of Home Affairs
- Ministry of Environment/Environment Control Agency
- Ministry of Marine Affairs and Fisheries
- Meteorology, Climatology, and Geophysical Agency (BMKG)
- Ministry of Agriculture
- Ministry of Health
- Ministry of Public Works
- Ministry of Transportation
- Ministry of Villages and Development of Disadvantaged Regions
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- National Disaster Management Authority
- National Research and Innovation Agency

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Together with the team, provided support in developing atmospheric climate modeling and projections, as well as sectoral climate hazard analysis, utilizing climate data sourced from BMKG and global data providers.

**Sectoral Economic Impact and Loss Assessment Team**

This team conducted studies on the impacts of climate change across the priority sectors of Climate Resilience Development and assessed potential economic losses. The findings from these studies serve as a key basis for the formulation of Climate Resilience Development policies. Team members include:

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Executive Summary
Climate Resilience Development Policy 2.0 (2025–2045)

# INTRODUCTION

The impacts of climate change in recent years have necessitated the development of analytical methods that are responsive to current and future conditions. Such advancements are essential to support the adjustment of national policies and to strengthen cross-sectoral alignment. In response to these dynamics, the Climate Resilience Development Policy 2.0 (2025–2045) has been prepared to update the previous policy framework launched in 2021. This update includes a deeper analysis of climate hazards, strengthened prioritization of key locations, calculation of potential economic losses, and formulation of more comprehensive, evidence-based Climate Resilience Development actions. These improvements are intended to reinforce the analytical and technocratic foundations for national development planning and implementation at both central and regional levels.

The Climate Resilience Development 2.0 Series is organized into six complementary volumes:

- **Executive Summary: Provides a concise synthesis of the substance of the entire series.**
- **Book 1: Priority Locations and Actions: Presents the spatial basis for priority locations at the region/city level and associated actions.**
- **Book 2: Role of Government Agencies: Serves as a reference for coordination and mapping of cross-agency roles.**
- **Book 3: Contribution of Non-Government Actors: Maps strategic multi-stakeholder collaboration opportunities outside the government**
- **Book 4: Financing Strategies: Outlines the financing framework and potential funding mobilization for Climate Resilience Development investments.**
- **Book 5: Monitoring, Evaluation, and Reporting of Actions: Describes the framework for control, monitoring, evaluation, and reporting to ensure the effectiveness and accountability of policy implementation.**

The preparation of this document represents a collaborative effort with active support and contributions from Ministries and Agencies, Regional Governments, academia, development partners, non-government actors, and technical authors who provided data, information, analysis, and intellectual input. We express our highest appreciation for the commitment and cooperation of all parties, which enabled the completion of the Climate Resilience Development Policy 2.0 (2025–2045).

It is hoped that this document will serve as both a strategic and operational reference for all stakeholders in strengthening national climate resilience in a manner that is coherent, measurable, collaborative, and sustainability-oriented, laying the foundation for achieving Indonesia Emas 2045.

Jakarta, 2 December 2025

Authors


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# PREFACE

On this occasion, the Ministry of National Development Planning / Bappenas is pleased to publish the Climate Resilience Development (CRD) 2.0 document, which serves as an updated version of the CRD document previously issued in 2021. This document has been prepared with the objective of strengthening the policy foundation while ensuring that the national development plan is capable of responding to the increasingly complex challenges posed by climate change.

The refinement of this study emerged through intensive discussions with a wide range of stakeholders, including government institutions and non-government actors. This collaborative approach not only enriched the analysis with more up-to-date data but also broadened the perspective on understanding the context of climate hazards and the levels of societal vulnerability. A cross-sectoral approach forms a critical foundation to ensure that priority locations, actions, and the roles of government agencies and non-government actors are fully integrated.

The CRD 2.0 document also strengthens the governance framework by outlining institutional roles in a more systematic manner, clarifying adaptive and accountable financing mechanisms, and updating the monitoring and evaluation system to ensure that development outcomes can be measured transparently. Through these enhancements, development policies and programs are expected to be more focused on risk reduction, climate impact management, and the enhancement of social, ecological, and economic resilience.

We are confident that the findings of this study can be widely utilized by planners, policymakers, academics, and development partners in formulating more effective programs and interventions. Moving forward, cross-sectoral collaboration must continue to be strengthened so that Indonesia is increasingly prepared to face the impacts of climate change and achieve resilient, inclusive development.

**Minister of National Development Planning/Head of Bappenas**

**Rachmat Pambudy**

# PREFACE

Climate change represents an increasingly tangible and urgent development challenge. As the world's largest archipelagic country, Indonesia stands at the forefront of climate risks that threaten national social, economic, cultural, and ecological resilience. These impacts not only disrupt the livelihoods of communities but also have the potential to impede the acceleration of development toward the Vision of Indonesia Emas 2045. This situation necessitates the establishment of policies that are anticipatory, adaptive, coherent, and oriented toward long-term outcomes.

The Climate Resilience Development (CRD) Policy serves as a strategic instrument to ensure that national development is responsive to climate-related risks. Within the framework of the National Long-Term Development Plan (RPJPN) 2025–2045 and the National Medium-Term Development Plan (RPJMN) 2025–2029, CRD directs cross-sectoral and cross-regional transformation to mainstream climate resilience principles into both planning and implementation. To ensure consistent implementation, a guiding document outlining operational directives for government institutions and other stakeholders is essential.

The Climate Resilience Development 2.0 (CRD 2.0) Document 2025–2045 has been prepared as a detailed elaboration and operationalization of the CRD mandate within RPJPN 2025–2045 and RPJMN 2025–2029. This policy provides a comprehensive, evidence- and data-based implementation framework that can be applied by all relevant stakeholders. Its preparation reflects Indonesia's commitment to strengthening governance for more resilient and sustainable development. Through a collaborative, multi-stakeholder approach, CRD 2.0 promotes joint efforts to reduce risks and minimize losses from climate change while simultaneously reinforcing the foundation for resilient and inclusive development.

Furthermore, the strategic directions and implementation guidelines are integrated into the national development planning process. Within this framework, investments, programs, and climate resilience actions can be designed in a measurable and coherent manner aligned with national development priorities. CRD 2.0 functions not only as a technical reference but also as a strategic instrument to enhance Indonesia's role in national and global climate resilience agendas.

We extend our highest appreciation to all parties who have contributed to the preparation of this document. It is our hope that the CRD 2.0 Policy Document will serve as a solid foundation for our collective efforts in sustaining national development, ensuring that Indonesia remains resilient and prepared to face future climate challenges.

**Deputy for Food, Natural Resources, and Environment**
**Ministry of National Development Planning (Bappenas)**

**Leonardo A. A. Teguh Sambodo**

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## A

| | |
|---|---|
| **API** | Annual Parasite Incident |
| **APIK** | Adaptasi Perubahan Iklim di bidang Kesehatan (Climate Change Adaptation in the Health Sector) |

## B

| | |
|---|---|
| **Balinusra** | Bali-Nusa Tenggara (Bali-Nusa Tenggara Region) |
| **BNPB** | Badan Nasional Penanggulangan Bencana (National Disaster Management Agency) |

## C

| | |
|---|---|
| **CVI** | Coastal Vulnerability Index |

## D

| | |
|---|---|
| **DAS** | Daerah Aliran Sungai (Watershed (River Basin Area)) |
| **DBD** | Demam Berdarah Dengue (Dengue Hemorrhagic Fever) |
| **DIBI** | Data dan Informasi Bencana Indonesia (Disaster Information and Data System) |

## G

| | |
|---|---|
| **GT** | Gross Tonnage |
| **GRK** | Gas Rumah Kaca (Greenhouse Gases) |

## I

| | |
|---|---|
| **ICCSR** | Indonesia Climate Change Sectoral Roadmap |
| **IE** | Indonesia Emas (Golden Indonesia) |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **IR** | Incidence Rate |
| **IRBI** | Indeks Risiko Bencana Indonesia (Indonesian Disaster Risk Index) |

## K

| | |
|---|---|
| **K/L** | Kementerian/Lembaga (Ministries/Agencies) |

## N

| | |
|---|---|
| **NAP** | National Adaptation Plan |
| **NOAA** | National Oceanic and Atmospheric Administration |

## O

| | |
|---|---|
| **OPT** | Organisme Pengganggu Tumbuhan (Plant Pest Diseases) |

## P

| | |
|---|---|
| **PBI** | Pembangunan Berketahanan Iklim (Climate Resilience Development) |
| **PDB** | Produk Domestik Bruto (Gross Domestic Product) |
| **PEP** | Pemantauan, Evaluasi, dan Pelaporan (Monitoring, Evaluation, and Reporting) |
| **Perpres** | Peraturan Presiden (Presidential Regulation) |
| **PN** | Prioritas Nasional (National Priority) |
| **PP** | Peraturan Pemerintah (Government Regulation) |
| **PPN/ Bappenas** | Kementerian Perencanaan Pembangunan Nasional/Badan Perencanaan Pembangunan Nasional (Ministry of National Development Planning/National Development Planning Agency) |

## R

| | |
|---|---|
| **RAN-API** | Rancangan Aksi Nasional - Adaptasi Perubahan Iklim (National Action Plan for Climate Change Adaptation) |
| **RCP** | Representative Concentration Pathways |
| **RPJMN** | Rencana Pembangunan Jangka Menengah Nasional (National Medium Term Development Plan) |
| **RPJPN** | Rencana Pembangunan Jangka Panjang Nasional (National Long Term Development Plan) |
| **Rantek** | Rancangan Teknis (Technical Design Document) |

## S

| | |
|---|---|
| **SDGs** | Sustainable Development Goals |
| **SIDIK** | Sistem Informasi Data Indeks Kerentanan (Vulnerability Index Data Information System) |

## T

| | |
|---|---|
| **TNx** | Temperature Extreme minimum |

## U

| | |
|---|---|
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **UU** | Undang - Undang (Law (Act of Parliament)) |

## W

| | |
|---|---|
| **WMO** | World Meteorological Organization |
| **WPI** | Weather-related Pneumonia Index |


MEDICAL PATIENT

# 1. THE URGENCY OF CLIMATE RESILIENCE DEVELOPMENT IN INDONESIA

Various international scientific reports such as the Intergovernmental Panel on Climate Change (IPCC), World Meteorological Organization (WMO), National Oceanic and Atmospheric Administration (NOAA), and other institutions reveal that global temperatures are rising significantly and consistently compared to pre-industrial periods. In addition to the increase in global average temperatures, the occurrence of daily and seasonal extreme temperatures, this series of changes is clear evidence of climate change that has implications for various development sectors.

Climate change, accompanied by an increase in extreme weather events, has led to an increase in hydrometeorological disasters, such as floods, landslides, droughts, tidal waves, and coastal abrasion. In the last decade, data from the National Disaster Management Agency (BNPB) shows that hydrometeorological disasters dominate 98-99% of all disasters and show an increasing trend in Indonesia. The accumulation of these disasters has caused casualties and infrastructure damage, which in turn has triggered economic losses and reduced the community's ability to maintain their livelihoods, especially for low- to middle-income communities with high levels of vulnerability. Without resilient and inclusive development, climate change will worsen the economic situation and social inequality in the future. In addition to affecting land areas, climate change puts significant pressure on marine ecosystems and coastal areas. Indonesia, as an archipelagic country with two-thirds of its territory consisting of sea, faces increasingly significant impacts due to the vital role of marine areas in supporting food security, providing livelihoods for millions of fishermen, and serving as natural protection. Changes in sea surface temperature, sea level rise, and intensification of extreme weather are now threatening the stability of coastal ecosystems. The consequences can be seen in the occurrence of abrasion, tidal flooding, and coastal area shrinkage, which are driving population displacement in coastal areas. Thus, climate change has a real impact on the sustainability of ecosystems and welfare in the coastal sector.

Rising sea surface temperatures have caused fishing grounds to shift or shrink to deeper and more distant waters, thereby reducing fishermen's incomes, disrupting the food security of coastal communities, and threatening the sustainability of fisheries-based economies. The increased frequency of high waves, including waves over 2 meters in open waters and waves over 1.5 meters near the coast, also threatens the safety of navigation and fishing boats <10 GT. The area of waters exposed to high waves is projected to continue expanding until 2045 when compared to historical conditions, which has the potential to increase risks to various marine sector activities.

**Figure 1.**
**Impact of Climate Change**


Various risks in reach sector, Sech as:

**Marine & Coastal** Sector

Threats include maritime accidents involving small-scale fishing vessels (<10 GT) and a high potential for coastal abrasion

**Water** Sector

The area is exposed to multiple hydrometeorologacal hazards, including flooding, dhrought, and landslides

**Agriculture** Sector

Agricultural production, particularly rice, and horticultural commodities, has experienced declines

**Health** Sector

In addition, there has been an increase in the incidence of climate-sensitive diseases, such as dengue fever, malaria, penumonia, and diarrhea


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The impact of climate change also exacerbates the vulnerability of the water sector in various regions by disrupting the hydrological balance of watersheds and increasing the risk of hydrometeorological disasters such as droughts, floods, and landslides. Extreme or prolonged droughts can reduce river flow and decrease the availability of clean water sources, triggering a water supply deficit for domestic needs and basic services. These conditions ultimately have the potential to hinder the achievement of household water security targets. The intensification of climate variability phenomena such as La Niña, which is becoming more extreme, has also led to an increase in the frequency and intensity of large-scale flooding, which has resulted in infrastructure damage, disruption of public services, and a decline in environmental quality in various regions of Indonesia in recent years.

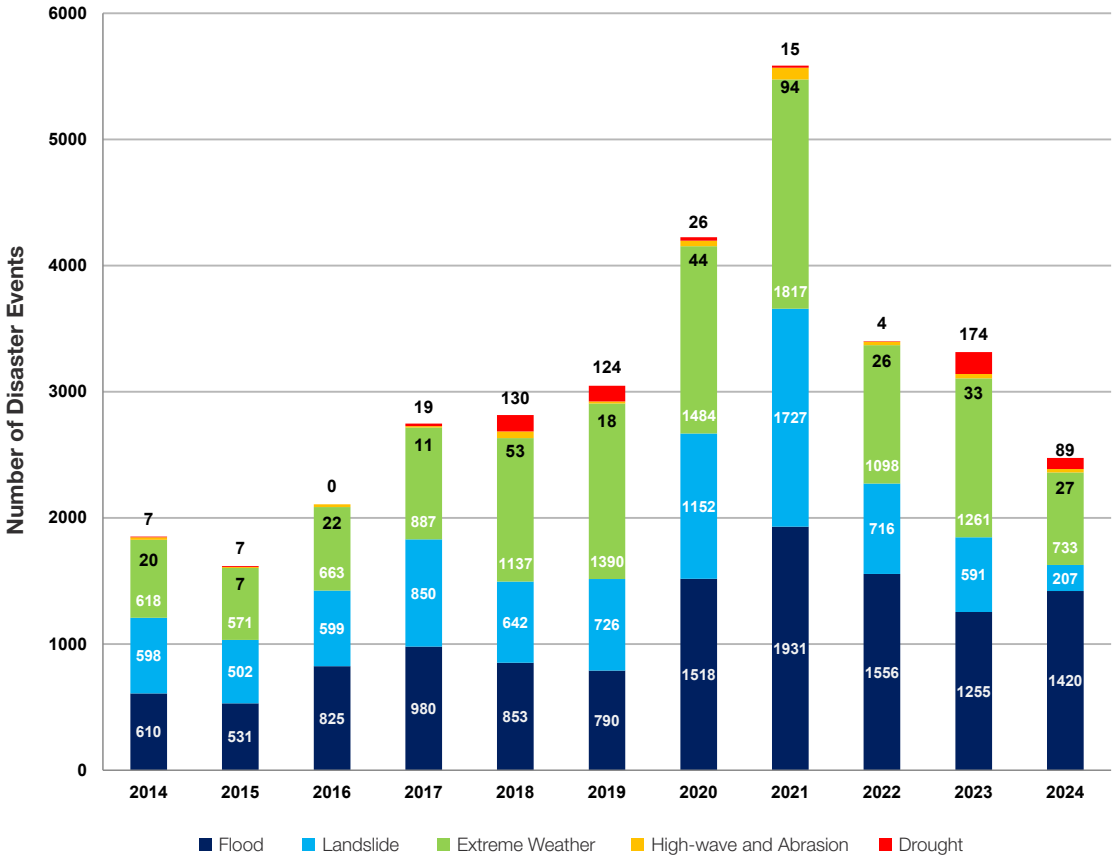
In the agricultural sector, climate change has triggered increasingly unpredictable climate variability, including irregular onset and peak of the rainy season, prolonged dry periods, and extreme rainfall events in a short duration, posing significant challenges for cultivation and agricultural production risk management. Unstable climatic conditions have the potential to cause shifts in planting patterns, declines in agricultural production, and increased risk of crop failure due to limited water availability for irrigation systems and attacks by plant pests that are more sensitive to environmental changes. The accumulation of these impacts not only threatens the stability of farmers' incomes, but also has the potential to disrupt national food security due to fluctuations in the supply and prices of strategic commodities. In the health sector, changes in temperature patterns, daily temperature variability, rainfall, and humidity due to climate change increase the risk of climate-sensitive diseases through changes in habitat, life cycles, and the transmission capacity of infectious agents. Warmer and more humid conditions expand the environmental suitability for vectors such as Aedes and Anopheles, thereby increasing the potential for transmission of dengue fever and malaria.

In addition to the increased risk of vector-borne diseases, unstable climate variability also affects environmental conditions, including through the growth of microorganisms in dwellings with inadequate ventilation or structure. These changes reduce indoor air quality and increase exposure to respiratory infection risk factors, which ultimately contribute to increased susceptibility to pneumonia, especially in vulnerable groups such as toddlers, the elderly, and individuals with comorbidities.

Meanwhile, irregular rainfall that triggers flooding increases the mobilization and spread of waterborne pathogens through contamination of drinking water sources and leaky sanitation systems. On the other hand, prolonged dry periods reduce the availability of clean water for consumption and hygiene, thereby triggering inadequate sanitation practices. The combination of these hydrometeorological conditions increases the risk of exposure to pathogens that cause diarrhea, especially in groups with limited access to safe drinking water and sanitation services.

**Figure 2.**

Climate Disaster Occurrence Trends, 2015–2024

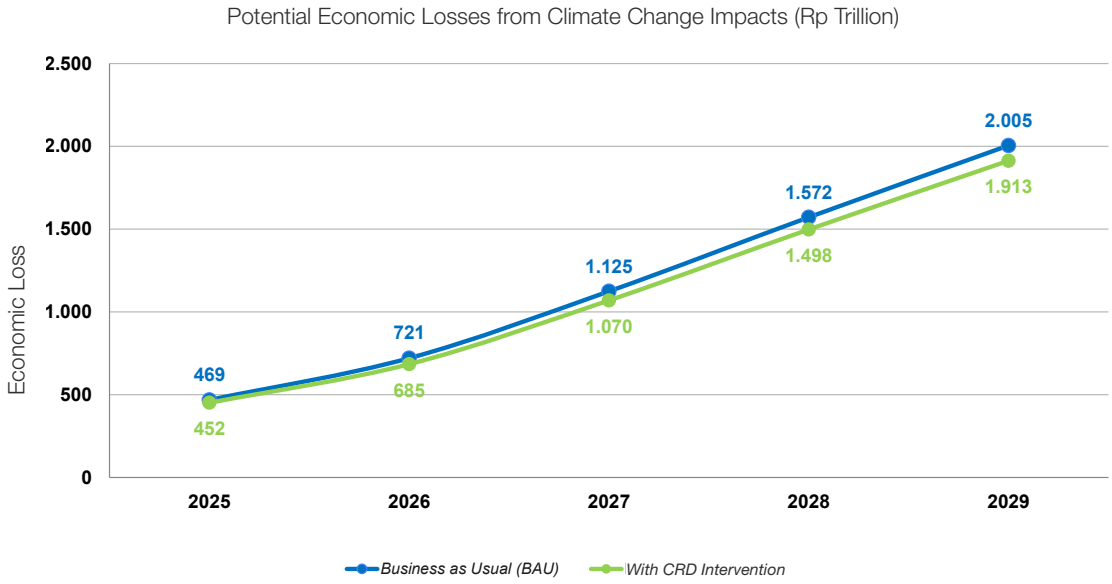



Source: BNPB, 2025

Overall, climate change, which is one of the world's three major crises (the triple planetary crisis), has become a real and complex threat. The depiction of climate hazards and risks underscores the importance of addressing climate change. Countries that do not build climate resilience from the outset face the risk of incurring significantly higher recovery costs than those that prioritize Climate Resilience Development in vulnerable areas and strengthen adaptation actions. In this context, early assessment of potential losses, especially in priority sectors, is crucial for understanding the scale of risks that may arise and for preparing the right course of action. This initial assessment ensures that interventions are formulated in a strategic and efficient manner, slt enables Climate Resilience Development efforts to be targeted toward areas of high vulnerability and economic risk, supporting both responsive action and anticipatory measures to reduce future economic losses and safeguard long-term development outcomes.

**Figure 3.**

**Potential Economic Losses from Climate Change Impacts 2025-2029**




Based on a study conducted by Bappenas in 2025, projections of economic losses resulting from the impacts of climate change in four priority sectors show a significant upward trend over the 2025–2029 period.

Figure 3 presents a graph illustrating two policy scenarios: the Business as Usual (BAU) scenario, which reflects conditions without intervention from Climate Resilience Development Actions, and the scenario with Climate Resilience Development Action interventions, representing conditions in which climate resilience strengthening is implemented in a planned, coordinated, and integrated manner. Under the BAU scenario, the potential value of losses is estimated to reach approximately IDR 2,005 trillion by 2029. In contrast, the scenario with Climate Resilience Development Action interventions is able to reduce the rate of increase in potential losses, with total losses in the same year estimated at IDR 1,913 trillion.

This difference in loss trajectories suggests that the implementation of Climate Resilience Development Actions plays a crucial role in mitigating potential economic losses resulting from the impacts of climate change. It is important to note that the current estimates of economic losses do not fully capture all components of climate change impacts, including indirect losses, long-term damages, and residual effects that remain methodologically challenging to quantify. Consequently, the reported figures are considered conservative, as they underestimate the true extent of losses by excluding certain impact factors.

This limitation underscores the critical role of Climate Resilience Development as a strategic policy framework to enhance disaster and climate resilience, while mitigating the potential economic losses from climate change as part of the broader national development strategy.

# 2. GLOBAL AGREEMENTS AND NATIONAL COMMITMENTS IN CLIMATE RESILIENCE DEVELOPMENT

## GLOBAL AGREEMENTS

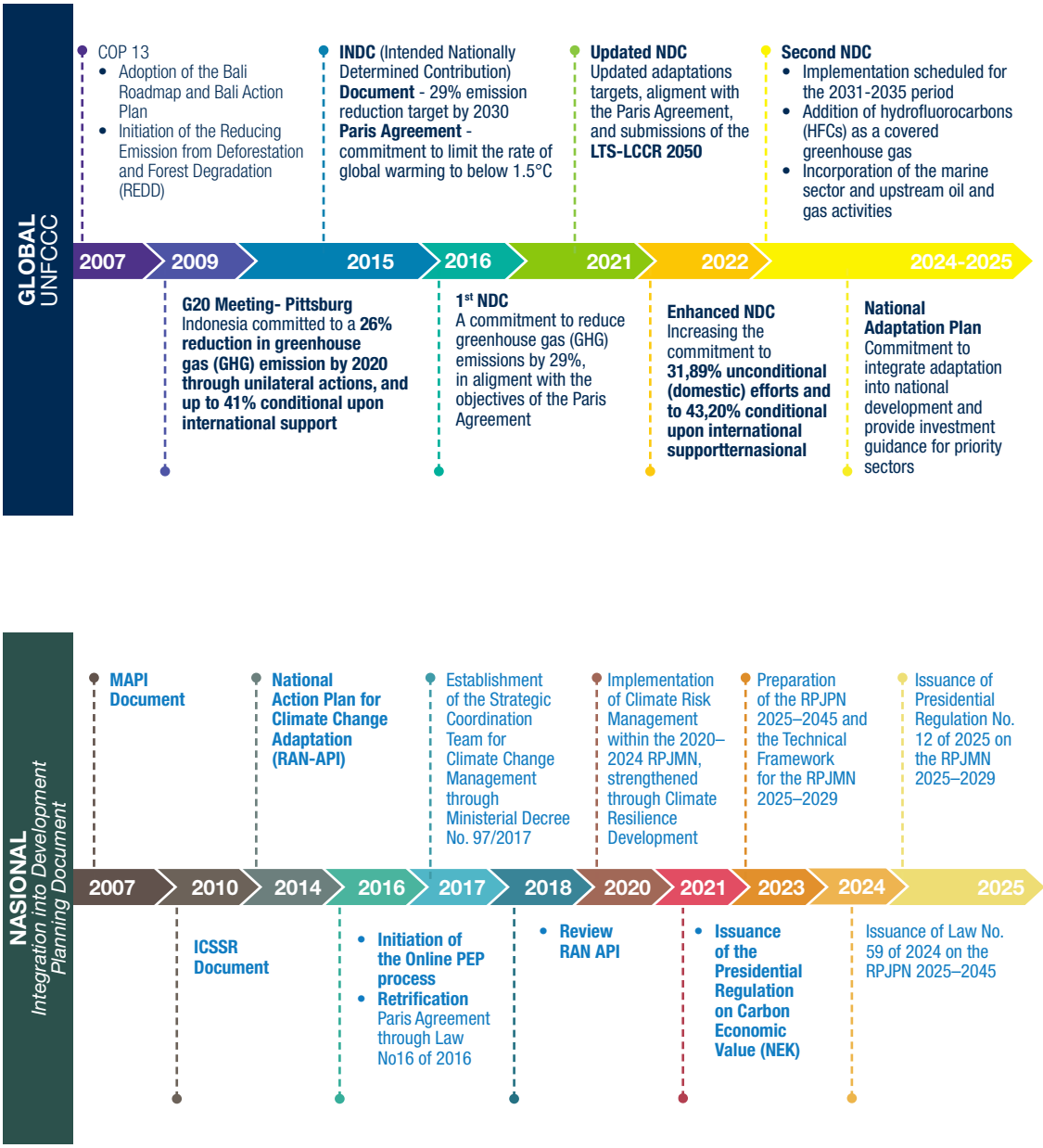
Climate change is a global issue that requires collective commitment from all nations to address its impacts. The United Nations Framework Convention on Climate Change (UNFCCC) serves as the primary foundation for international cooperation to formulate policies and establish global mandates for climate change mitigation and adaptation. Through this framework, countries are encouraged to act in a fair and proportional manner to prevent and minimize losses and damages according to their respective capacities.

Recent scientific findings compiled in the IPCC Sixth Assessment Report (AR) 6 (2021–2023) indicate that global warming is accelerating faster than previously projected, with an average temperature increase of approximately 1.2–1.3°C over the last decade. The period from 2023 to 2024 has been recorded as the warmest in history, with several months temporarily exceeding the 1.5°C threshold. These findings underscore the narrowing window to limit warming below 1.5°C, placing the world at risk of surpassing this boundary in the early 2030s unless mitigation efforts are significantly accelerated.

As a demonstration of its commitment at the international level, the Government of Indonesia submitted its National Adaptation Plan (NAP) to the UNFCCC in November 2025 (see Figure 4). The NAP document supports the overarching goals of global climate agreements, such as the 2015 Paris Agreement, which emphasizes climate resilience and low-carbon development, as well as the 2030 Agenda for Sustainable Development, particularly SDGs 2, 6, 11, and 13. This step reflects Indonesia's serious efforts to ensure national preparedness and resilience in addressing the impacts of climate change, while simultaneously strengthening the country's role in implementing integrated adaptation actions aligned with sustainable development policies.

**Figure 4.**

Climate Resilience Development Policy in the RPJMN 2025–2029




Source: Authoring Team, 2025


At the national level, the Government of Indonesia has also demonstrated its commitment to addressing the impacts of climate change through the formulation of various policies and regulations that support the implementation of concrete actions related to climate issues. In 2007, the Government issued the MAPI document (Mitigation and Adaptation to Climate Change) as an initial effort to integrate climate issues into development planning. This effort was further strengthened by the development of the Indonesia Climate Change Sectoral Roadmap (ICCSR) in 2010, which provided a sectoral framework addressing climate change impacts and adaptation needs.

Subsequently, in 2014, the National Action Plan for Climate Change Adaptation (RAN-API) was published as a national guideline for implementing cross-sectoral and cross-regional climate adaptation. Indonesia's commitment was further reinforced through the ratification of the Paris Agreement into national law via Law No. 16 of 2016, which mandates the country to reduce emissions and enhance resilience to climate impacts. As a follow-up, RAN-API was reviewed in 2018 to ensure alignment with the latest climate dynamics and development priorities. This initiative was further strengthened by the designation of Climate Resilience Development as the 6th National Priority (Prioritas Nasional - PN) 6 in the 2020–2024 National Medium-Term Development Plan (RPJMN). This milestone marked a crucial turning point as climate issues were explicitly incorporated into the national medium-term development planning framework.

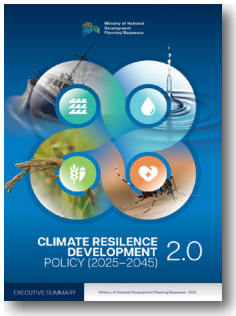
The strengthening process continued with the formulation of long-term planning documents. In the 2025–2045 National Long-Term Development Plan (RPJPN), Climate Resilience Development is articulated as part of Golden Indonesia (Indonesia Emas - IE) 17 vision, which emphasizes socio-ecological transformation toward low-carbon and Climate Resilience Development.

As a five-year elaboration of the National Long-Term Development Plan (RPJPN), the Climate Resilience Development Policy is integrated into the RPJMN for 2025–2029. This policy is designated as Priority Program 8, with an indicator focusing on the percentage reduction of potential economic losses from climate change relative to GDP, targeting four priority sectors: marine and coastal, water, agriculture, and health. To achieve this target, four strategic approaches are implemented to strengthen social, ecological, and economic resilience in response to the impacts of climate change.

**Figure 5.**

Climate Resilience Development Policy Documents

## 6 THE DOCUMENT OF **CLIMATE RESILIENCE DEVELOPMENT 2.0**

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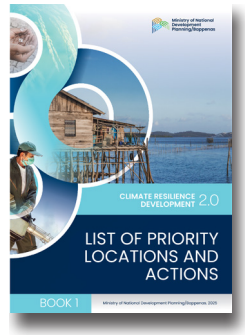
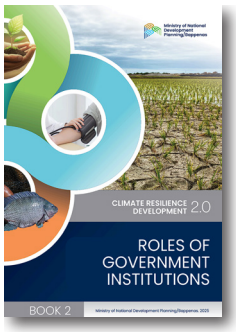
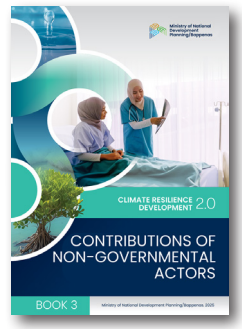


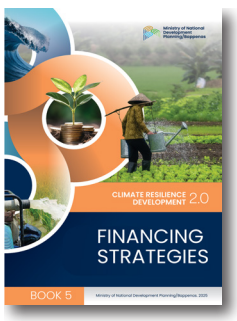

BOOK 1 **PRIORITY LOCATIONS AND ACTIONS**



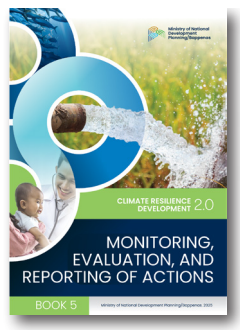

BOOK 2 **ROLE OF GOVERNMENT AGENCIES**




BOOK 3 **CONTRIBUTIONS OF NON-GOVERNMENT ACTORS**




BOOK 4 **FINANCING STRATEGIES**




BOOK 5 **MONITORING, EVALUATION, AND REPORTING OF ACTION**

# 3. DEFINITION OF CLIMATE RESILIENCE DEVELOPMENT AND PRIORITY SECTOR

The impacts of climate change are increasingly evident across various sectors related to different aspects of life. Therefore, addressing these impacts requires a more directed and systematic approach. This effort begins with climate adaptation, defined as the process of adjustment within social, economic, and ecological systems to minimize losses while simultaneously capitalizing on emerging opportunities resulting from climate change. Alongside advancements in climate change science and the evolving discourse, the concept of Climate Resilience Development has emerged, defined as:

***"Climate Resilience Development is a development approach aimed at strengthening the capacity of national planning and implementation systems to anticipate threat, reduce risks, withstand, recover from, and adapt to the impacts of climate change."***

Thus, Climate Resilience Development actions are essential as policy implementation instruments across various sectors and regions.The management of climate change impacts is concentrated on four priority sectors: marine and coastal, water, agriculture, and health. These sectors were selected due to their significant contributions to societal well-being, ecosystem sustainability, and economic stability. Accordingly, a comprehensive understanding of the diverse climate hazards and their impacts within each priority sector serves as the fundamental basis for formulating Climate Resilience Development actions.

## PROFILE OF CLIMATE HAZARDS AND IMPACTS IN PRIORITY SECTORS

**Figure 6.**
**Sector Related to Climate Resilience Development**

# MARINE AND COASTAL SECTOR

The impacts of climate change on the marine sector can be observed from historical wave heights in Indonesia, which indicate variations across several regions. Climate projections for the period 2025–2045 under the RCP4.5 scenario indicate an increase in wave heights of up to 3.0 meters, particularly in the southern regions of Indonesia that are directly exposed to monsoon winds and currents from the Indian Ocean.

In contrast, the RCP8.5 scenario presents a more extreme pattern, with wider and more intense high-wave zones extending to open waters such as the Timor Sea, Banda Sea, and the southern coasts of Kalimantan and Southeast Sulawesi. This increase has direct implications for coastal erosion, tidal flooding, damage to coastal infrastructure, disruption of maritime navigation, and increased pressure on coastal ecosystems.

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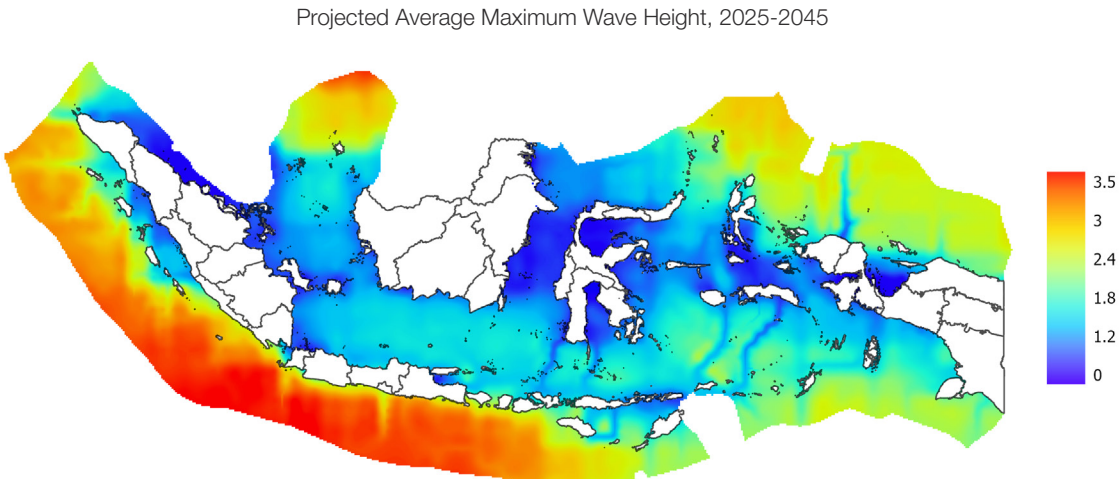
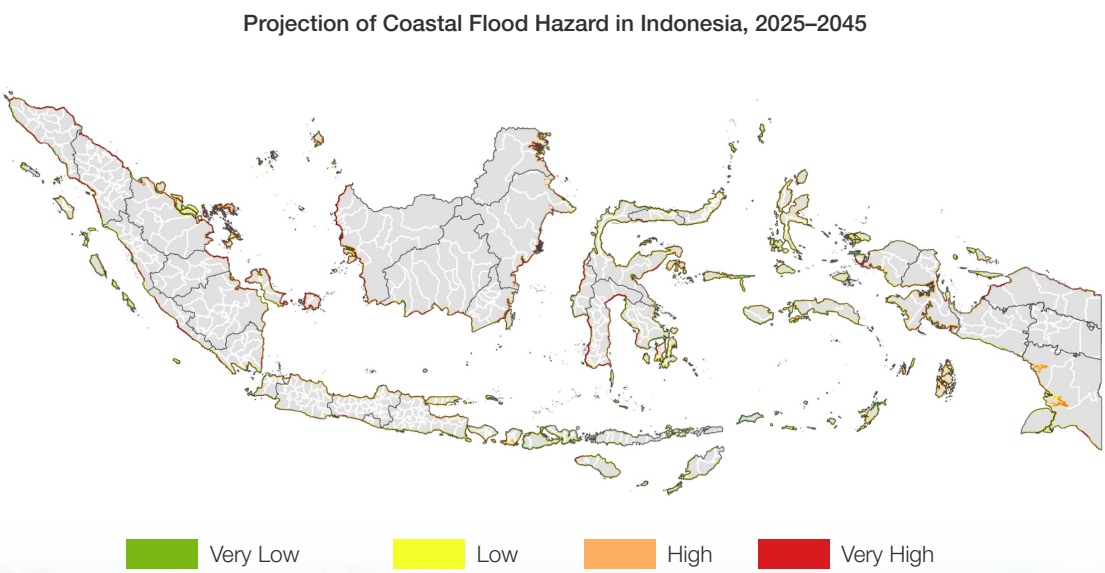
**Figure 7.**
**Projection of Average Maximum Wave Height, 2025–2045**




Furthermore, the impacts of climate change on the coastal sub-sector are exacerbated by rising sea levels and increasing wave intensity. These conditions trigger the potential for shoreline displacement in several coastal areas, resulting in significant coastal erosion. Based on erosion projections for the period 2025–2045, Indonesia is estimated to potentially lose up to approximately 1,000 km² of coastal area at the national scale. Areas with very high erosion risk have been identified in Central Java, East Java, Banten, East Nusa Tenggara, and DKI Jakarta.

**Figure 8.**
**Projection of Coastal Flood Hazard in Indonesia, 2025–2045**

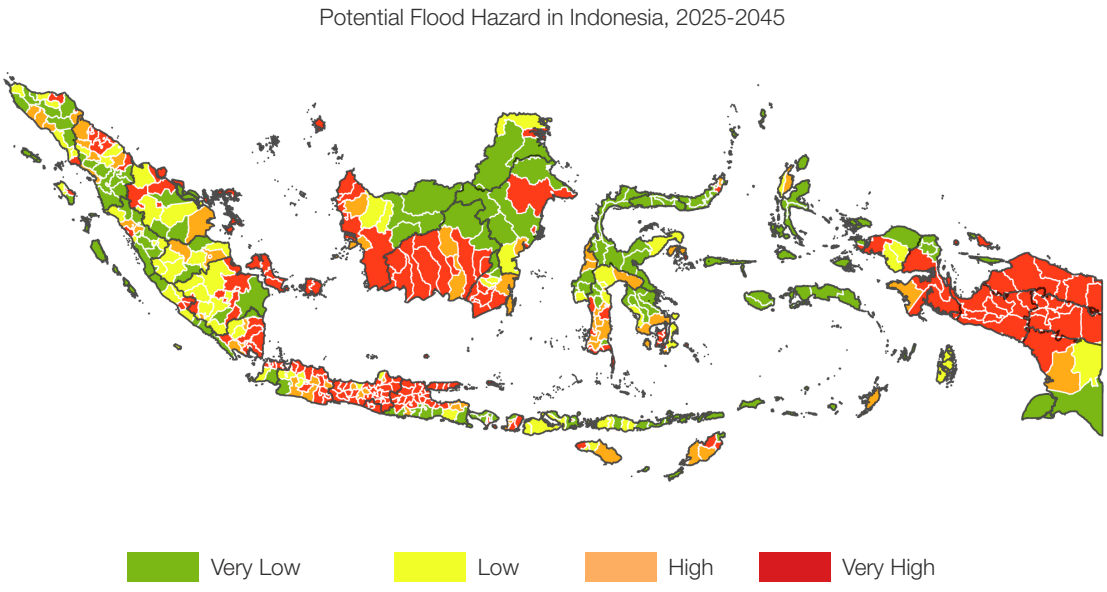



## WATER SECTOR

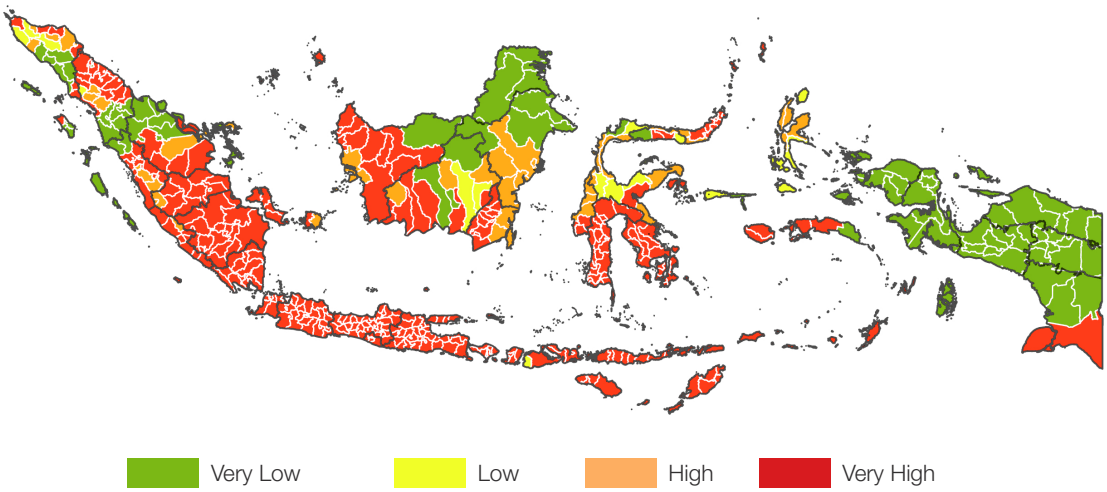
The analysis of the water sector was conducted by integrating atmospheric projections with the physical topography to assess potential hazards for the period 2025–2045. Scenario-based projections under RCP4.5 and RCP8.5 indicate that various regions across Indonesia will experience increased hydrometeorological hazards as a result of climate change. There is evidence that the distribution of flood, drought, and landslide hazards does not follow a uniform pattern, but rather exhibits distinct threat characteristics across different regions. High flood hazards are predominant in central–southern Kalimantan, Papua, parts of northern and eastern Sumatra, and regions of Java. These areas are generally low-lying and intersected by major river networks. Drought hazards are concentrated in Java, along the southern coast of Sumatra, the NTT–NTB–Bali region, and South Sulawesi. These regions exhibit a tendency for reduced surface water availability.

Landslide hazards follow the pattern of Indonesia's main mountainous zones. High landslide risks are concentrated in Papua and northern regions, characterized by steep slopes, highly mobile soils, and intense rainfall that accelerates soil saturation. Changes in land cover and land use further exacerbate slope instability, making landslide events increasingly difficult to predict and potentially more impactful. Additionally, the analysis indicates that several regencies and cities are exposed to multiple hazard types, highlighting the presence of multi-hazard threats in certain regions.

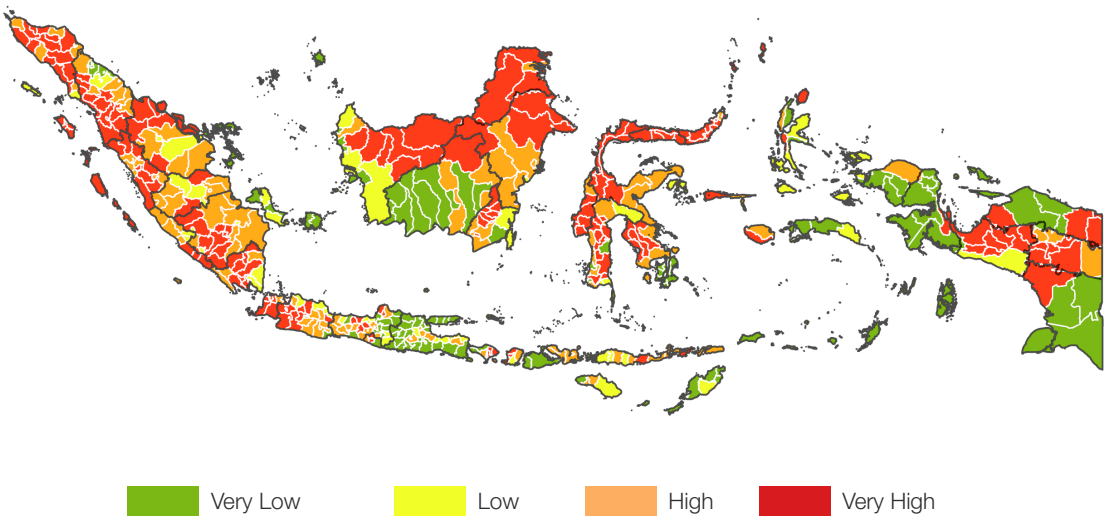
**Figure 9.**
**Projection of Flood, Drought, and Landslide Hazards, 2025–2045**



Potential Drought Hazard in Indonesia, 2025-2045




Potential Landslide Hazard in Indonesia, 2025-2045



## AGRICULTURAL SECTOR

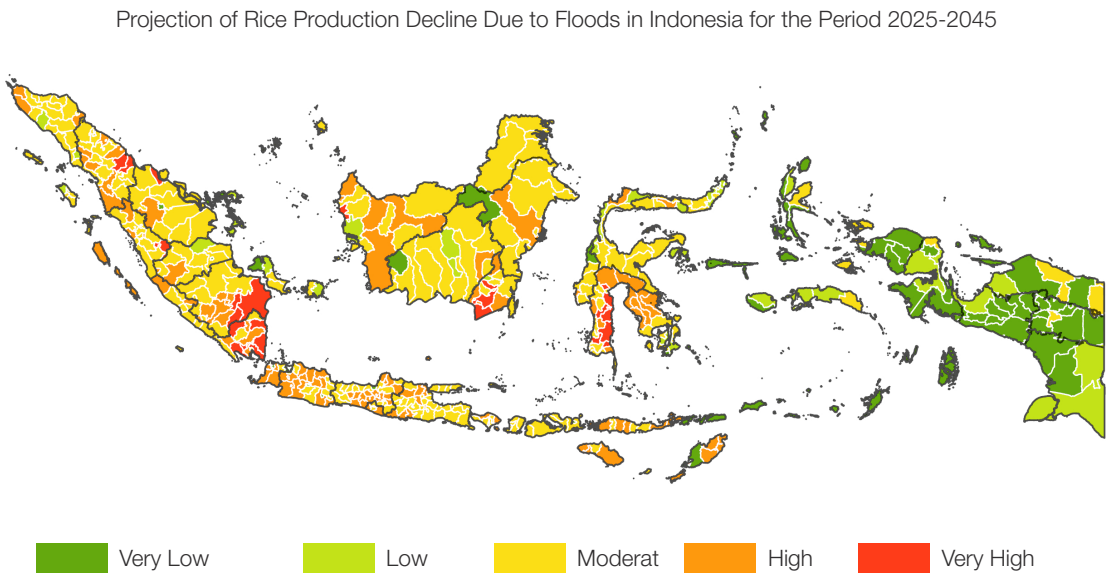
Climate hazard projections under both RCP4.5 and RCP8.5 scenarios indicate a potential decline in rice and horticultural production across many regions in Indonesia. Very high and high climate hazards associated with flooding, with potential production losses of up to 17.5% or more, are projected in most parts of Sumatra and Java, South Sulawesi, and East Kalimantan. Meanwhile, the potential for very high and high rice production losses due to drought is identified in South Sumatra, Lampung, West Java, East Java, Central Java, South Sulawesi, South Kalimantan, East Nusa Tenggara, and West Nusa Tenggara.

In addition to drought and flooding, rice production losses may also result from attacks by Plant Pest and Disease Organisms (Organisme Pengganggu Tumbuhan -OPT). Although production losses from OPT are not as severe as those caused by drought and flooding, the affected areas are relatively widespread across Indonesia, and the quality of rice yields is also negatively impacted.

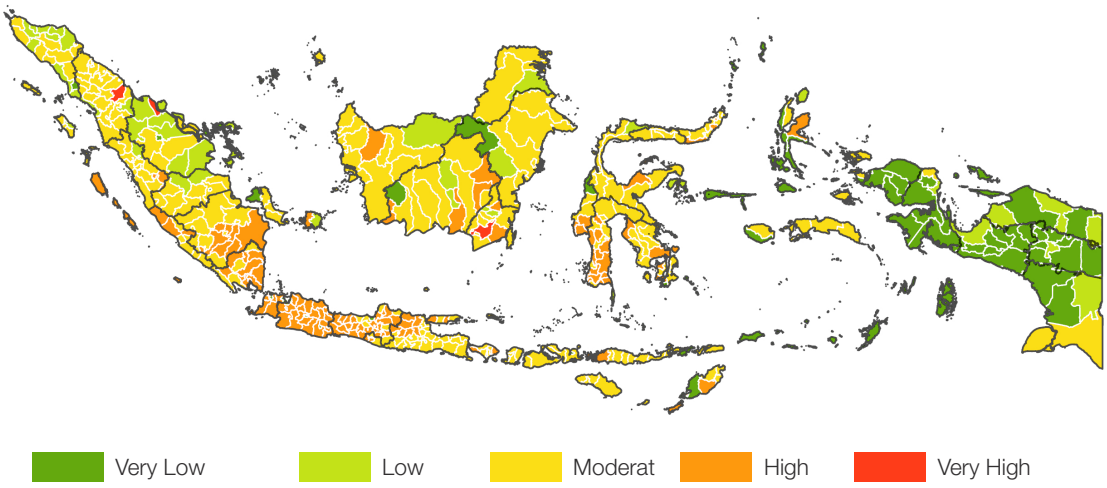
Horticultural crops, such as shallots and chili peppers, are likewise projected to experience production declines in several regions of Indonesia. For shallots, very high and high production losses are projected in multiple areas within East Java, Central Java, West Sumatra, North Sumatra, and certain regions of Aceh, West Java, East Nusa Tenggara, West Nusa Tenggara, North Sulawesi, and Central Sulawesi. Chili production losses are also projected across a wide range of regions, spanning Sumatra, Java, Kalimantan, Sulawesi, Bali–Nusa Tenggara (Bali Nusra), Maluku, and Papua.

**Figure 10.**

**Projection of Rice Production Decline Due to Floods, Droughts, and Pest and Disease Outbreaks for 2025–2045**



*Projection of Rice Production Decline Due to Drought in Indonesia for the Period 2025-2045*




Projection of Rice Production Decline Due to Pests and Disease in Indonesia for the Period 2025-2045

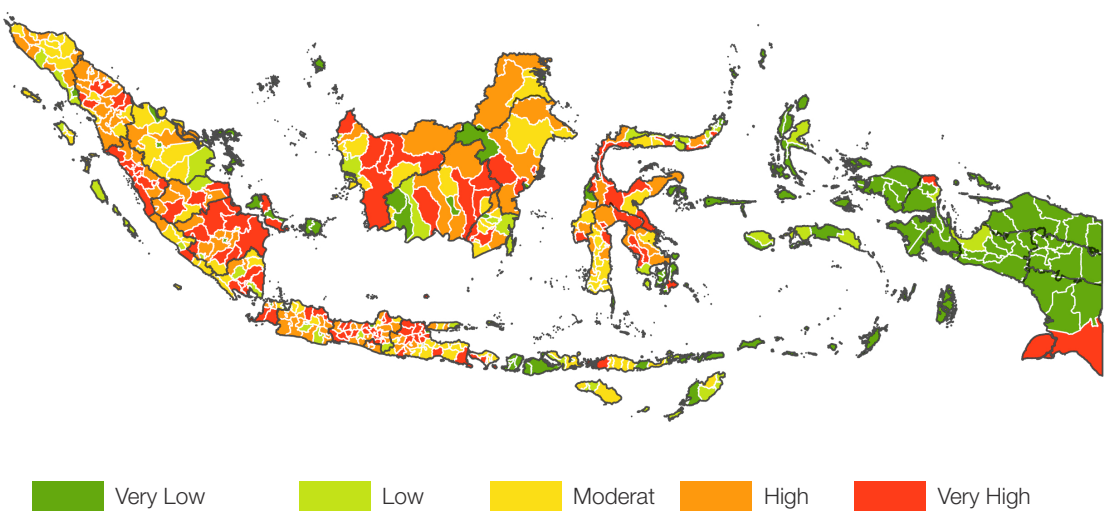
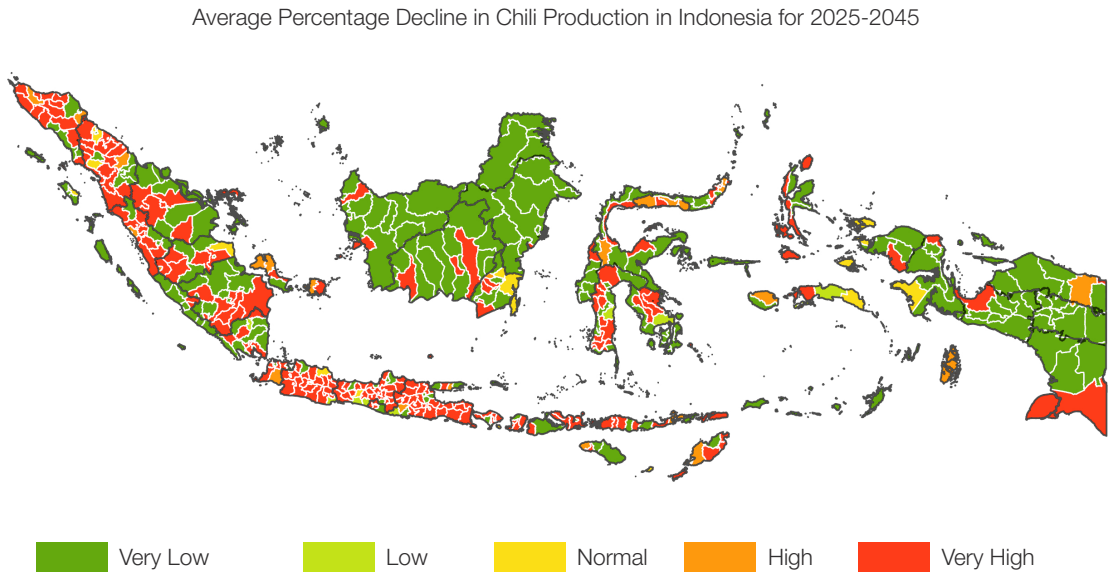
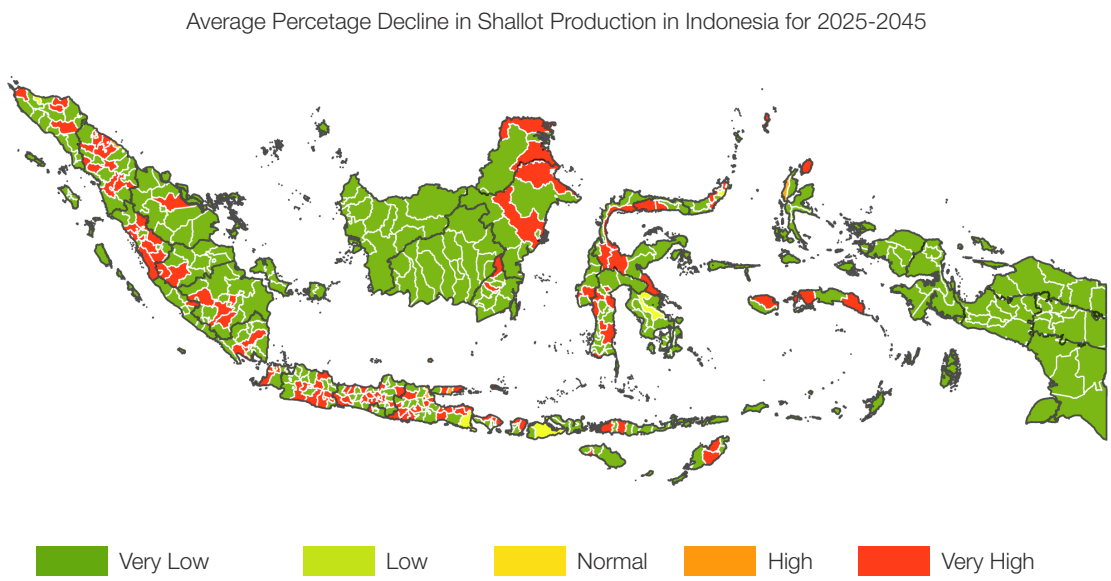


**Figure 11.**

**Projection of Chili and Shallot Horticultural Production Decline for 2025–2045**



# HEALTH SECTOR

Climate change has the potential to increase the incidence of climate-sensitive diseases through alterations in temperature, precipitation, humidity, and disease transmission dynamics via causative agents, thereby triggering the emergence of new health risks and exacerbating existing conditions. Accordingly, understanding the relationship between changing climate conditions and health is critical for strengthening disease prevention and control efforts. Monitoring trends in climate-sensitive diseases is conducted using program indicators such as Incidence Rate (IR) and Annual Parasite Incidence (API), which are then analyzed in relation to climate projections under the RCP4.5 and RCP8.5 scenarios.

For Dengue Fever (DF), projections of IR for the period 2025–2045 under both RCP4.5 and RCP8.5 scenarios indicate a significant increase in transmission across various regions of Indonesia. Under the RCP4.5 scenario, areas with the highest IR values include the Thousand Islands (Kepulauan Seribu), Tambrauw, Sabang City, and Mahakam Ulu. Projections of IR and case numbers for pneumonia indicate the highest incidence in Gunung Kidul, Sleman, Bantul, and Yogyakarta City.

For diarrhea, under both climate change scenarios, regions with the highest IR include Kebumen, Central Jakarta, Tegal, East Lombok, Pandeglang, and Subang. Regarding malaria, projections of API and case numbers for the period 2025–2045 under RCP4.5 and RCP8.5 show that eastern Indonesia, particularly Papua and West Papua, remains at the highest risk for malaria transmission. Under the RCP4.5 scenario, areas with the highest average API include Mamberamo Raya Regency (Papua), South Manokwari (West Papua), Arfak Mountains (West Papua), and Sarmi (Papua). Under the RCP8.5 scenario, the spatial distribution of risk remains relatively similar, with high-risk areas concentrated in the same regions. High Annual Parasite Incidence (API) remains concentrated in eastern Indonesia. Mamberamo Raya Regency (Papua), South Manokwari (West Papua), the Arfak Mountains (West Papua), and Sarmi (Papua) continue to exhibit the highest API values.

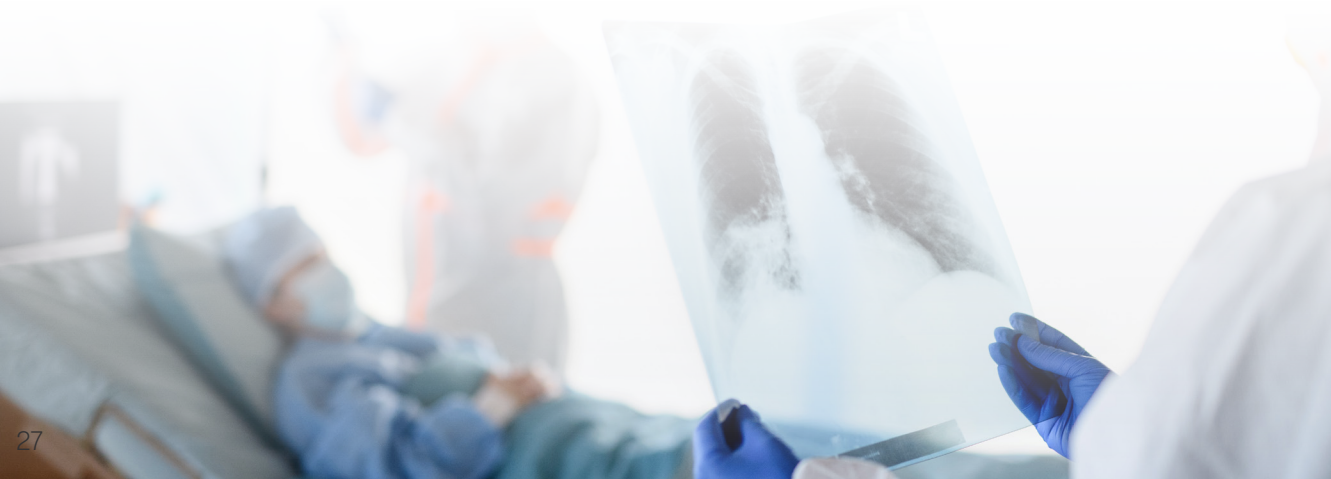
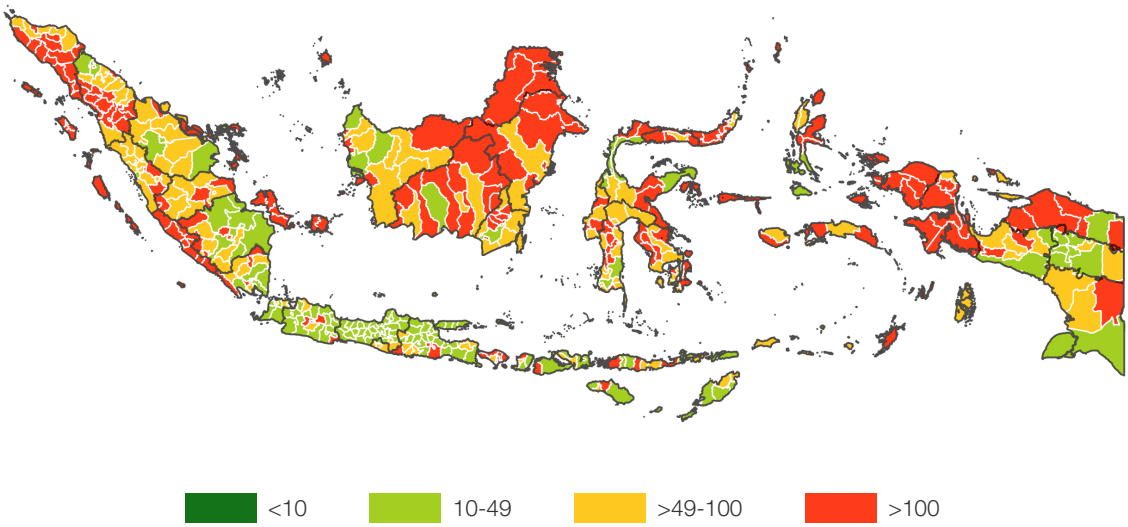


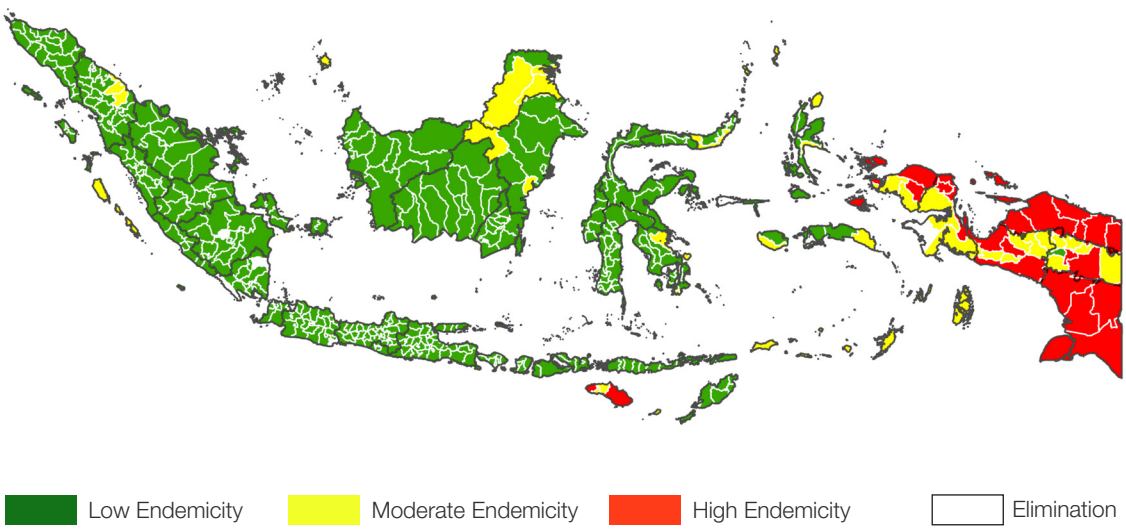
**Figure 12.**

**Projection of the Risk of Dengue Fever (DF), Malaria, Pneumonia, and Diarrhea Events for 2025–2045**

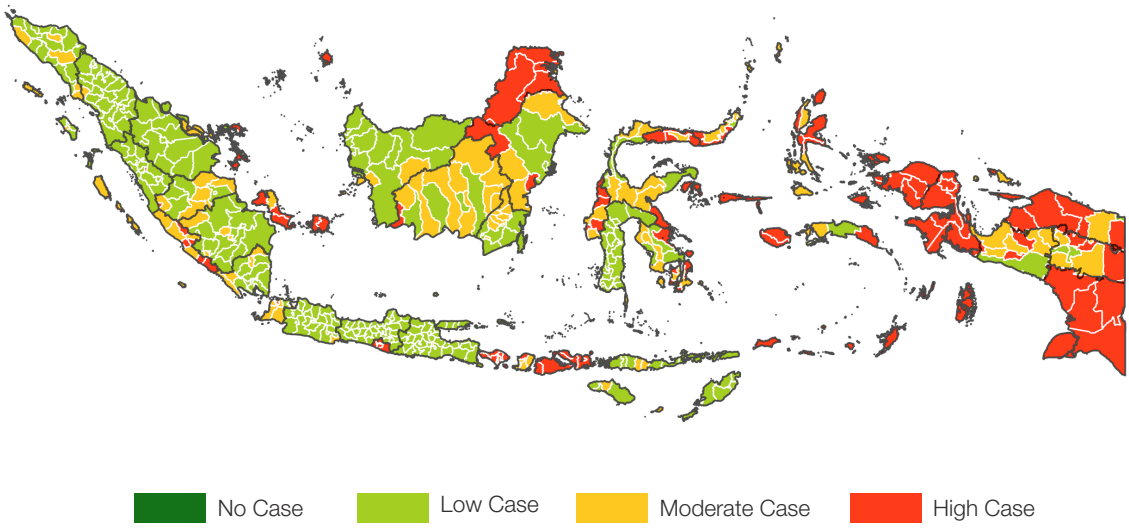
Projected Average Incidence Rate (IR) of Dengue Fever in Indonesia for 2025-2045



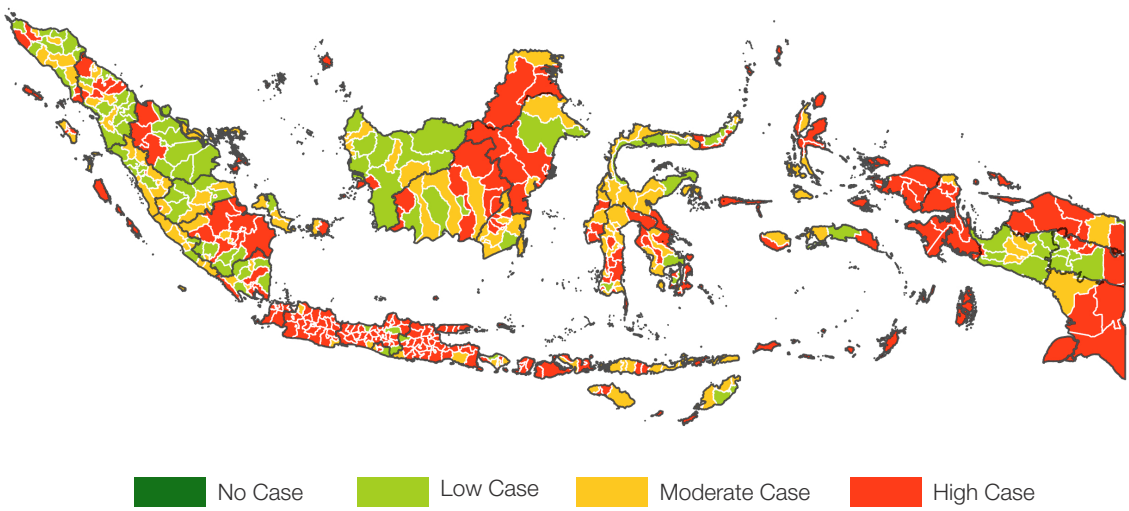

Projected Average Annual Parasite Incidence (API) of Malaria in Indonesia for 2025-2045



Projected Average Incidence Rate (IR) of Pneumonia in Indonesia for 2025-2045




Projected Average Incidence Rate (IR) of Diarrhea in Indonesia for 2025-2045

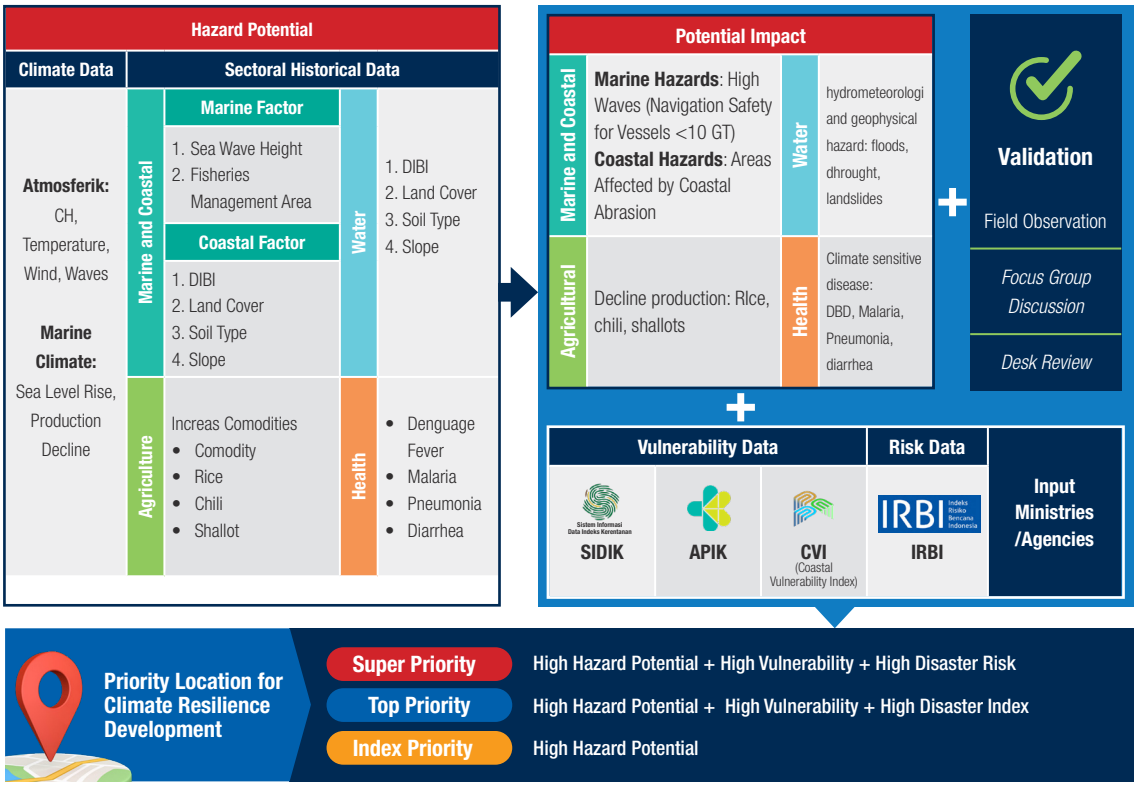


# 4. PRIORITY LOCATIONS FOR CLIMATE RESILIENCE DEVELOPMENT

The determination of priority locations for Climate Resilience Development is conducted using a multi-dimensional approach that integrates both top-down and bottom-up processes. The initial stage of site selection begins with an analysis of atmospheric climate projections, including variables such as precipitation, wind, temperature, and sea waves. Subsequently, these climate data are correlated with potential hazards across the four priority sectors, derived from historical sectoral event data.

This analysis is further reinforced through the utilization of supporting data, including environmental physical parameters, socio-economic vulnerability from SIDIK 2025, climate-related health risk indices (APIK), coastal vulnerability index (CVI), Regency/City Disaster Risk Index (Indeks Risiko Bencana Indonesia-RBI) 2024, as well as technical inputs from relevant ministries and agencies.

**Figure 13.**
**Stages for Determining and Categorizing Priority Locations for Climate Resilience Development**



The analysis results are categorized into Super Priority, Top Priority, and Priority locations. Super Priority locations are those with high climate hazard potential, high vulnerability, and high disaster or epidemiological risk. Top Priority locations comprise areas with high climate hazard potential and either high vulnerability or high disaster/epidemiological risk.

Priority locations are regions exhibiting only high hazard potential. Other locations not included in these three categories are considered to have low climate hazard potential. The designation of these locations aims to ensure that Climate Resilience Development actions are implemented in a targeted and effective manner.

**Table 1.**
**Distribution of the number of priority locations for Climate Resilience Development in marine and coastal sectors by region/city**

| Marine Coastal Sector | | | | | | | |
|---|---|---|---|---|---|---|---|
| No | Hazard | Region | | | City | | |
| | | Super Priority | Top Priority | Priority | Super Priority | Top Priority | Priority |
| 1 | **Marine Subsector** High Wave | 35 | 205 | 10 | - | 34 | 8 |
| 2 | **Coastal Subsector** Abrasion Risk | 178 | 47 | 11 | 12 | 21 | 12 |

**Table 2.**
**Distribution of the number of priority locations for Climate Resilience Development in the water sector by region/city**

| Water Sector | | | | | | | |
|---|---|---|---|---|---|---|---|
| No | Hazard | Region | | | City | | |
| | | Super Priority | Top Priority | Priority | Super Priority | Top Priority | Priority |
| 1 | **Flood Risk** | 120 | 83 | 23 | 7 | 46 | 30 |
| 2 | **Drought Risk** | 174 | 115 | 33 | 7 | 39 | 36 |
| 3 | **Landslide Hazard** | 135 | 66 | 15 | 6 | 10 | 16 |

**Table 3.**

Distribution of the number of priority locations for Climate Resilience Development in the agricultural sector by region/city

| Agriculture Sector | | | | | | | |
|---|---|---|---|---|---|---|---|
| No | Commodities | Region | | | City | | |
| | | Super Priority | Top Priority | Priority | Super Priority | Top Priority | Priority |
| 1 | **Rice Production** Decline Due to Flooding | 146 | 72 | 10 | 4 | 22 | 3 |
| 2 | **Rice Production** Decline Due to Drought | 196 | 98 | 26 | 8 | 23 | 16 |
| 3 | **Rice Production** Decline Due to Pest & DiseaseOPT | 52 | 98 | 41 | 1 | 7 | 7 |
| 4 | **Chili** | 135 | 65 | 29 | 8 | 21 | 5 |
| 5 | **Shallot** | 67 | 39 | 14 | 1 | 7 | 1 |

**Table 4.**

Distribution of the number of priority locations for Climate Resilience Development in the health sector by region/city

| Health Sector | | | | | | | |
|---|---|---|---|---|---|---|---|
| No | Case | Region | | | City | | |
| | | Super Priority | Top Priority | Priority | Super Priority | Top Priority | Priority |
| 1 | **Dengue Fever Case** | 15 | 141 | 148 | 9 | 40 | 34 |
| 2 | **Malaria Case** | 5 | 27 | 90 | 1 | 2 | 12 |
| 3 | **Pneumonia Case** | 12 | 95 | 192 | 3 | 15 | 50 |
| 4 | **Diarrhea Case** | 6 | 92 | 196 | 1 | 15 | 50 |

# 5. LIST OF CLIMATE RESILIENCE DEVELOPMENT ACTIONS

To strengthen resilience against the impacts of climate change, the implementation of Climate Resilience Development actions must be designed to be specific, measurable, achievable, relevant, and time-bound, enabling more effective planning, execution, monitoring, and performance evaluation. The definition of such actions is as follows:

***"Climate Resilience Development actions are interventions aimed at managing climate impacts and risks to enhance social and ecological resilience, while reducing potential economic losses in priority locations affected by climate change."***

These actions are categorized into core actions and supporting actions. Each action is analyzed based on the type of activity, expected outputs, targeted outcomes, and the responsible ministries or agencies for implementation. Furthermore, each type of action is designed according to four main approaches: infrastructure development, governance and financing enhancement, technology utilization, and capacity building. These approaches are consistently applied across the four priority sectors: marine and coastal, water, agriculture, and health.

**Table 5.**
Approaches for Developing the List of Climate Resilience Development Actions

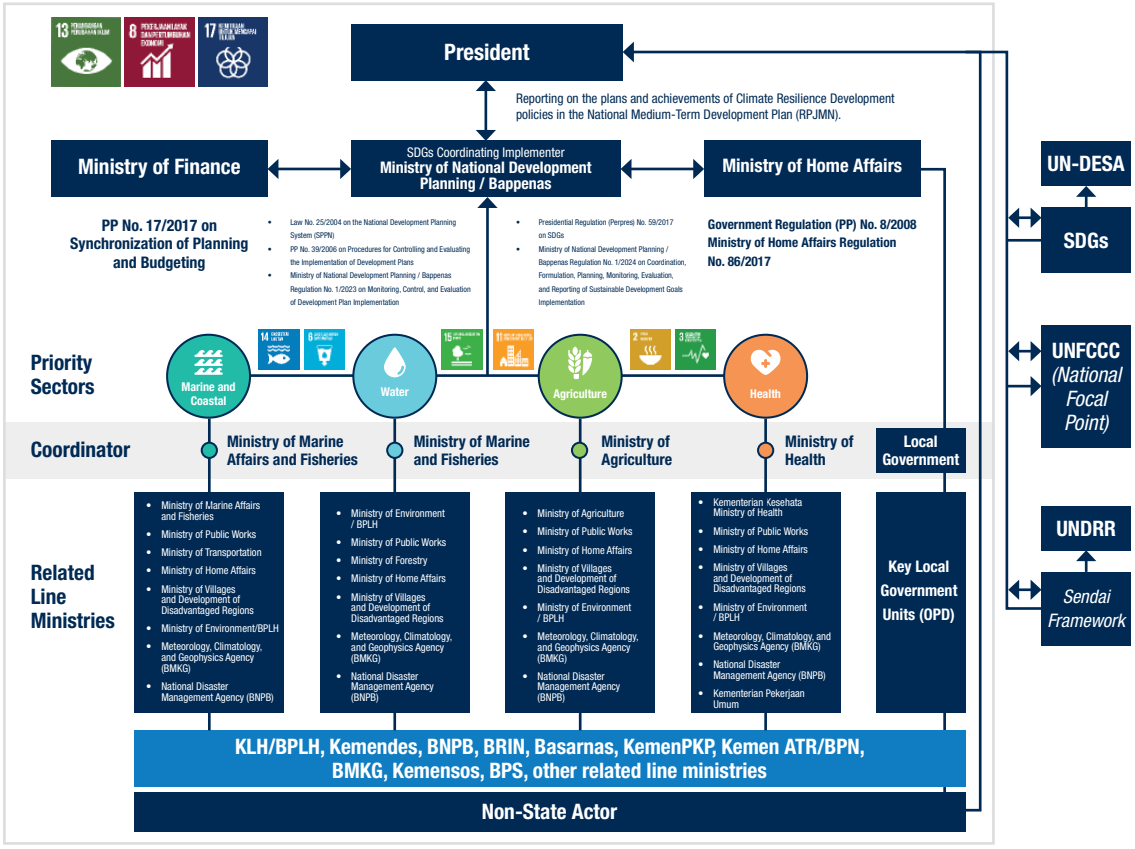
| Sector Prioritas | Group of Climate Resilience Action | | | |
|---|---|---|---|---|
| | Main Activity | | Supporting Action | |
| | Type of Action | Output | Outcome | Implementation (K/L) |
| Marine and Coastal | Infrastructure | Governance & Funding | Technology | Capacity Building |
| Water | | | | |
| Agriculture | | | | |
| Health | | | | |

A detailed list of climate resilience actions is available in
**PBI 2.0 Book 1 – Priority Locations and Actions**

# 6. ROLES OF GOVERNMENT INSTITUTIONS

Collaboration among government stakeholders constitutes the fundamental foundation for ensuring the successful implementation of the Climate Resilience Development Policy. The roles of ministries/ agencies and local governments encompass cross-sectoral coordination, planning, budgeting, and the integration of programs at both central and regional levels. The Ministry of National Development Planning/ Bappenas is responsible for controlling and evaluating the implementation of the RPJMN in accordance with statutory regulations. The Ministry of Finance ensures financing support aligned with fiscal policy and programmatic needs, while the Ministry of Home Affairs facilitates the harmonization of regional planning and budgeting processes to ensure that policy implementation at the local level is consistent with central government directives

**Figure 14.**
**Roles of Stakeholders in Implementing Climate Resilience Development Planning**



In the 2025–2029 Medium-Term Development Plan (RPJMN), Climate Resilience Development is designated as a Priority Program (PP) under National Priority (PN) 8. Furthermore, the Climate Resilience Development PP is operationalized through five Priority Activities (KP), namely:

1. Enhancement of Coastal and Marine Climate Resilience,
2. Climate-Adaptive Water Resources Management,
3. Development and Implementation of Climate-Smart Agriculture,
4. Prevention and Control of Climate-Sensitive Diseases, and
5. Strengthening Governance and Capacity for Climate Resilience Development

**Figure 15.**

**Sectoral Regulations Supporting the Implementation of the Climate Resilience Development Policy**

**Sectoral Regulations Supporting the Implementation of the Climate Resilience**

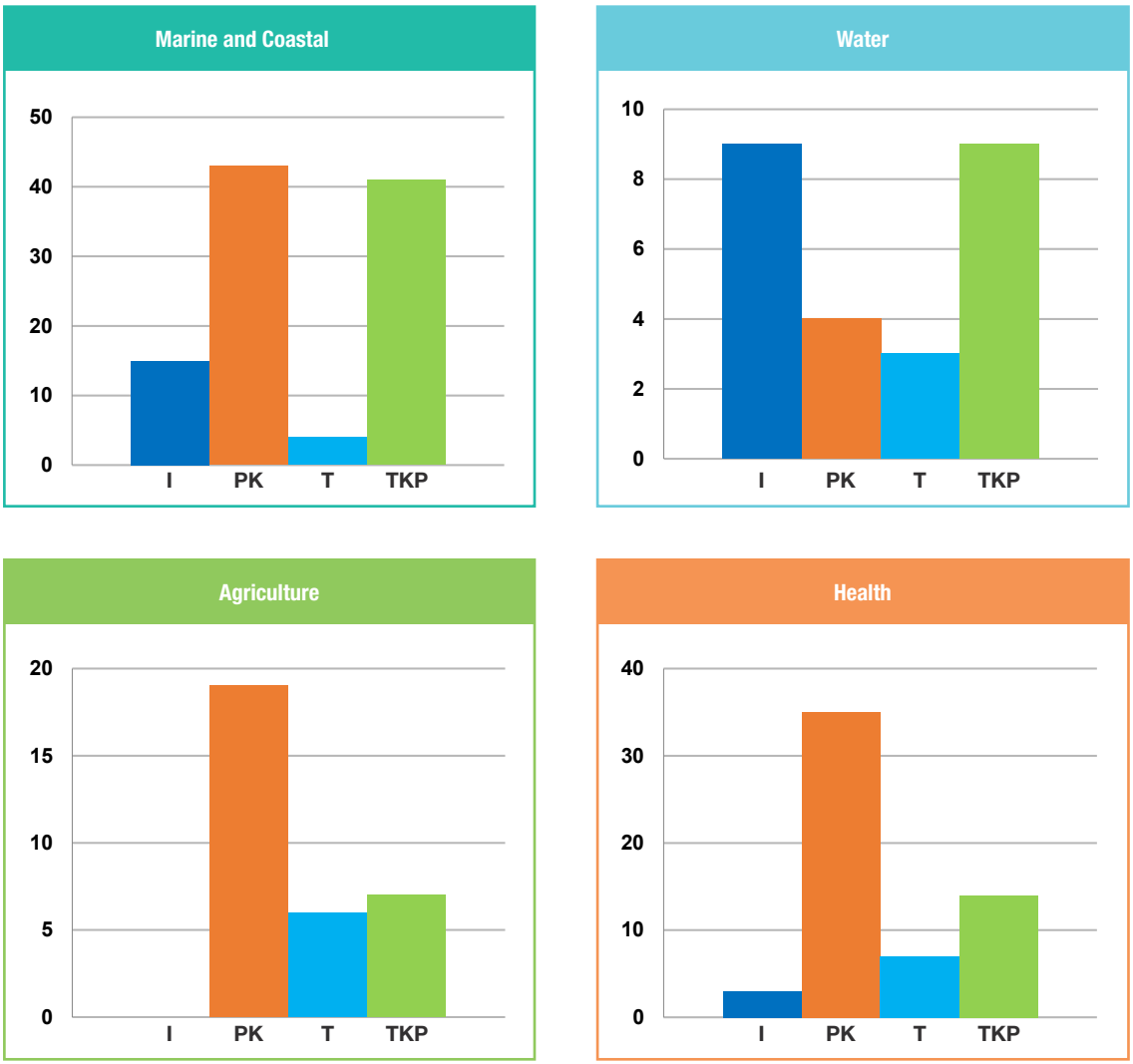
| Marine and Coastal | Water | Agriculture | Health |
|---|---|---|---|
| **Law No. 32 of 2014** on Marine Affairs | **Law No. 37 of 2014** on Soil and Water Conservation | **Law No. 22 of 2019** on the Sustainable Agricultural Cultivation System | **Law No. 17 of 2023 on Health** **Presidential Regulation No. 170 of 2024** on the Ministry of Public Works |
| **Law No. 1 of 2014** on the Management of Coastal Areas | **Law No. 17 of 2019** on Water Resources | **Presidential Regulation No. 192 of 2024** on the Ministry of Agriculture | **Regulation of the Minister of Health No. 2 of 2023** on the Implementing Regulation of Government Regulation No. 66 of 2014 on Environmental Health |
| **Law No. 66 of 2024** on Shipping | **Law No. 31 of 2009** on Meteorology, Climatology, and Geophysics | **Presidential Regulation No. 170 of 2024** on the Ministry of Public Works | **Regulation of the Minister of Health No. 22 of 2022** on Malaria Control |
| **Presidential Regulation No. 193 of 2024** on the Ministry of Marine Affairs and Fisheries | **Presidential Regulation No. 12 of 2024** on the Meteorology, Climatology, and Geophysics Agency (BMKG) | **Regulation of the Minister of Agriculture No. 2 of 2025** on the Organization and Governance of the Ministry of Agriculture | **Regulation of the Minister of Public Works and Public Housing No. 04/PRT/M/2017** on the Implementation of Domestic Wastewater Management Systems |
| **Presidential Regulation No. 170 of 2024** on the Ministry of Public Works | **Presidential Regulation No. 37 of 2023** on the National Water Resource Policy | **Decree of the Minister of Agriculture No. 72 of 2018** on National Agricultural Areas | **Decree of the Minister of Health of the Republic of Indonesia No. HK.01.07/Menkes/2147/2023** on the National Clinical Guidelines for the Medical Management of Pneumonia in Adults |
| **Law No. 27 of 2007 on the Management** of Coastal Areas and Small Islands | **Presidential Regulation No. 182 of 2024** on the Ministry of Environment | **Instruction of the President of the Republic of Indonesia No. 2 of 2025** on the Acceleration of Development, Upgrading, Rehabilitation, and Operation and Maintenance of Irrigation Networks to Support Food Self-Sufficiency | **Regulation of the Minister of Health No. 82 of 2014** on the Control of Communicable Diseases |
| **Minister of Marine Affairs and Fisheries Regulation No. 16 of 2025** on Climate Change Adaptation in Coastal Areas | **Presidential Regulation No. 170 of 2024** on the Ministry of Public Works | | |
| | **Regulation of the Minister of Environment and Forestry No. 23 of 2021** on the Implementation of Forest and Land Rehabilitation | | |

# 7. CONTRIBUTIONS OF NON-GOVERNMENTAL ACTORS

Climate change represents a multidimensional challenge that cannot be addressed by the government alone. The priority locations for Climate Resilience Development, once mapped, require interventions and active engagement from all actors at both the national and regional levels to realize inclusive and sustainable Climate Resilience Development. Through a participatory approach, non-governmental organizations are expected to act as catalysts for the implementation of national policies and local needs. This collaboration involves multiple stakeholders, including development partners, non-governmental organizations (NGOs), community-based organizations, and academic institutions, which play strategic roles in supporting the planning, implementation, and monitoring of Climate Resilience Development actions. Synergy between government and non-governmental actors is essential for achieving resilient and sustainable development. The contributions of non-governmental actors in implementing actions across priority sectors, following the approaches outlined in Climate Resilience Development, are illustrated in **Figure 16.**

**Figure 16.**

Proportion of Non-Government Institutions across Climate Resilience Development Priority Sectors




**Note**

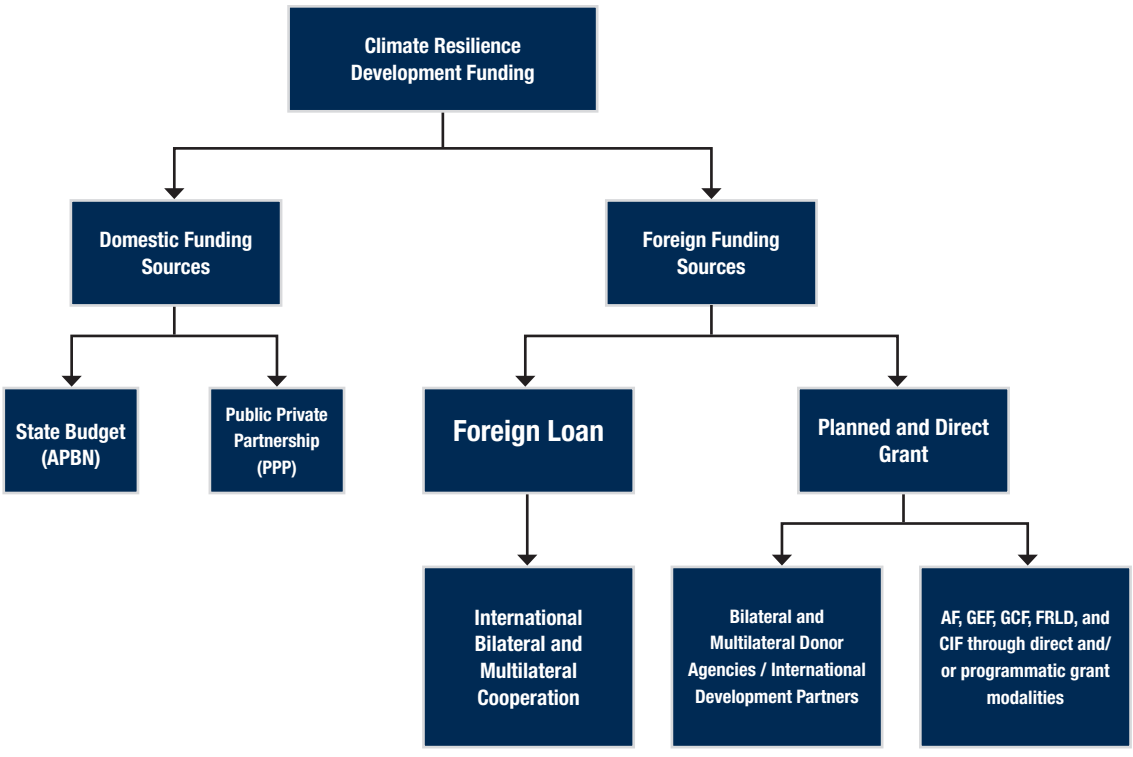
**I** : Infrastructure
**PK** : Capacity Building
**T** : Technology
**TKP** : Governance and Financing

# 8. FINANCING STRATEGY

The successful implementation of Climate Resilience Development actions in priority locations is highly dependent on the availability of adequate funding. Through a coordinated financing mechanism, resources can be sourced from both domestic and international channels (Figure 17).

These funds are utilized to ensure that all interventions are executed optimally, sustainably, and with measurable impact. Consequently, their management must be conducted with careful oversight to guarantee that each activity is carried out in accordance with the planned objective

Figure 17.
Funding Sources for Climate Resilience Development Actions



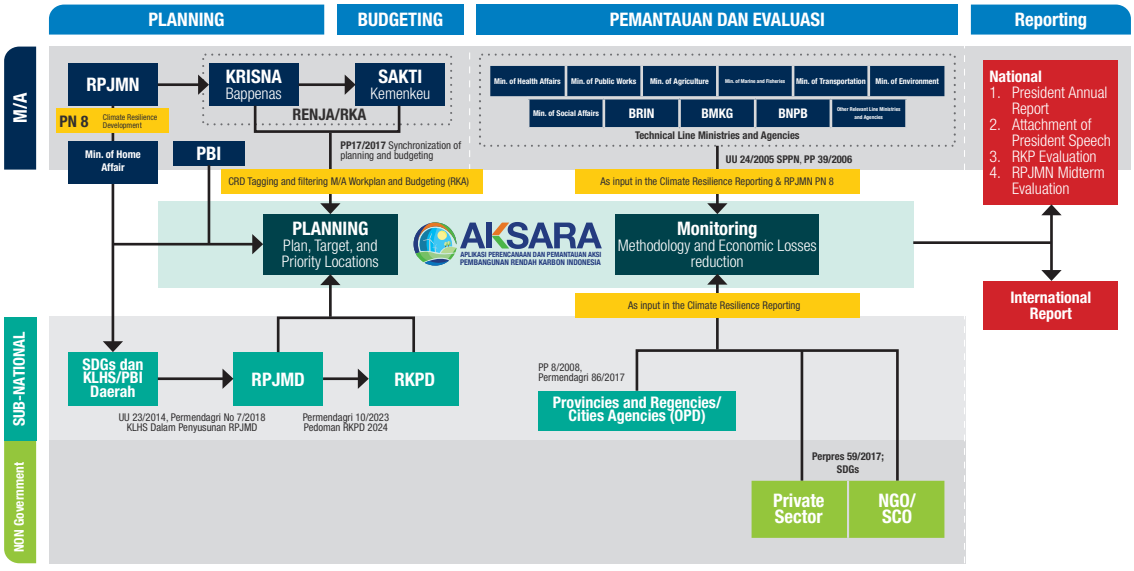
# 9. MONITORING, EVALUATION, AND REPORTING OF CLIMATE RESILIENCE DEVELOPMENT ACTIONS

The government, through the Ministry of National Development Planning (Kementerian PPN/Bappenas), performs oversight and evaluation functions for the national development plan. The legal basis for this function refers to Law No. 25 of 2004 on the National Development Planning System and its implementing regulations. This process begins with the preparation and formalization of the plan, followed by the monitoring, control, and evaluation of its implementation. Oversight and evaluation activities include tracking program execution, assessing the effectiveness of interventions, and measuring progress against development targets.

To ensure consistency and measurability in planning, Kementerian PPN/Bappenas tracks Climate Resilience Development actions through a tagging mechanism and coordination with relevant sectoral ministries/agencies. The planning process is facilitated by the KRISNA application (Kementerian PPN/Bappenas), which provides structured data on detailed allocations from program to component level, alignment with priorities, and cross-sectoral integration. These planning data are subsequently integrated with the SAKTI application (Ministry of Finance) to serve as the basis for budget preparation, ensuring a direct link between development planning and budgeting. Through this mechanism, tagging strengthens the foundation for decision-making, including in the determination of implementation priorities.

**Figure 18.**

**Proses Pemantauan, Evaluasi, dan Pelaporan Pembangunan Berketahanan Iklim dalam AKSARA**



During the implementation phase, the Ministry of National Development Planning (Kementerian PPN/ Bappenas) monitors the progress of work plans and assesses development achievements based on established indicators. Achievement measurement includes estimating the potential losses that can be avoided due to the impacts of climate change, serving as a key indicator for the Climate Resilience Development Priority Program (PP). Additionally, each sectoral Priority Activity (KP) within the Climate Resilience Development PP has specific performance indicators that contribute indirectly to the achievement of the overarching PP indicator.

The monitoring and evaluation of the implementation of the Climate Resilience Development PP work plan are conducted periodically through the AKSARA application. Information from AKSARA serves as the basis for assessing implementation effectiveness, identifying gaps between achievements and targets, and formulating corrective measures. The results of these monitoring and evaluation activities are compiled into performance reports, which provide feedback for policy refinement in the subsequent planning cycle. Thus, the integration of KRISNA, SAKTI, and AKSARA establishes a comprehensive and accountable planning–budgeting–implementation–reporting workflow, simultaneously enhancing the quality and effectiveness of national development

# CLOSING

The Climate Resilience Development Policy represents a key national commitment to addressing the impacts of climate change. The implementation of Climate Resilience Development actions is concentrated in three categories of priority locations—super-priority, top-priority, and priority—based on climate hazards and potential impacts. Optimal implementation of these actions requires coordination and collaboration among diverse stakeholders, supported by adequate financing. To ensure alignment between planning and implementation, a structured, systematic, and continuous process of monitoring, evaluation, and reporting must be maintained.

Consequently, the implementation of this policy not only strengthens social, economic, and ecological resilience but also ensures that national development progresses toward a more resilient, competitive, and sustainable trajectory

BAPPENAS
Kementerian Perencanaan Pembangunan Nasional/
Badan Perencanaan Pembangunan Nasional

# CLIMATE RESILIENCE DEVELOPMENT POLICY 2.0 (2025–2045)

EXECUTIVE SUMMARY