National Agency for Disaster Management
(BNPB)

FOREWORD

As part of the implementation of Law Number 24 Year 2007 on Disaster Management, particularly Article 36, the Government and Local Government, in line with their authority, have to prepare Disaster Management Plan; the preparation of which will be coordinated by the Agency.

Based on the stipulation of the Law, BNPB has coordinated government ministries and agencies at the national level that have duties related to disaster management, to formulate the National Disaster Management Plan (Renas PB), which has been conducted in the fiscal year of 2009.

With the completion of the National DM Plan, it is expected that all disaster management related activities, from prevention, mitigation, preparedness, emergency response to recovery, could refer to the plan. In its implementation, it is expected that the formulated programs/activities could be mainstreamed into the strategic plans of every relevant government ministries and agencies.

In this occasion, let us thank the cross-Ministries and Agencies Formulation Team that has contributed their insightful ideas and inputs so that the National DM Plan can be completed.

We hope that the National Disaster Management Plan may help realize the conduct of disaster management that is planned, well-directed and integrated, as we all desire and in line with disaster management missions in Indonesia.

Chief

Dr. Syamsul Maarif, M.Si.

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INTRODUCTION

1.1 BACKGROUND

Indonesia is a hazard prone country. History has shown that Indonesia was home to two biggest volcanic eruptions in the world. In 1815 Tambora Volcano in Sumbawa Island, West Nusa Tenggara, erupted and spewed out 1.7 million tones of volcanic ash and materials. Part of the volcanic materials formed a layer in the atmosphere that reflected the sun rays back to the atmosphere. Since the amount of sun rays that entered the atmosphere was decreased significantly, the earth did not receive enough heat and it gave rise to cold wave. The cold wave turned the year 1816 into "a year without summer" and caused widespread crop failure and hunger throughout all over the world. In the same century, Krakatau Volcano erupted in 1883. It was estimated that the eruption equals to the explosion produced by a 200 megaton TNT, or approximately 13,000 times the strength of the explosion produced by the atomic bomb that destroyed Hiroshima in the World War II.

The deadliest disaster occurred in early XXI Century also happened in Indonesia. On 26 December 2004, a big earthquake struck in the sea near Simeuleu Island, west of Sumatra Island. The earthquake triggered a tsunami that later killed more than 225,000 people in eleven countries and devastated coastal areas in the countries it affected. During the XX Century there were only few disasters with massive victims like the 2004 tsunami. In Indonesia alone the earthquake and tsunami killed around 165,708 people and affected a loss of over Rp 48 trillion.

In addition to the large scale disasters reported in history, Indonesia was also affected by big disasters that happened nearly every year and incurred losses that were not insignificant. The annual floods that affect Jakarta it surrounding areas, towns and districts along the Bengawan Solo River basin and many areas in the country has caused trillions of rupiah material and immaterial losses. The case is also true with drought hazard that has become more and more common in many parts of Indonesia, which in addition to threatening productive crop production also has the potential to impoverish people whose livelihoods depend on farming, plantation and livestock.

In order that the country could face better the increased potential and complexity of disasters in the future, Indonesia needs an integrated, coordinated and comprehensive disaster management plan. The plan is in line with the priority of the United Indonesia Cabinet II. The National Disaster Management Plan represents the condition desired by the Government of the Republic of Indonesia in the

forthcoming five years in the field of disaster management. It is started with the identification of existing hazards, analysis of the disaster risks and presentation of the programs and priority focuses that will be implemented, including the participation of the national Ministries/Agencies and the related indicative budget needed.

The National Disaster Management Plan, which subsequently will be called the DM Plan, is the realization of the government effort to formulate effective disaster management programs and priority focuses. The document is formulated based on the mandate of the Law No. 24 Year 2007 on Disaster Management.

The National DM Plan is an official document that contains data and information related to disaster risks in Indonesia in 2010-1014 and the government's plan to reduce these risks through development programs and activities. The DM Plan constitutes a proposal from the government that consists of effective disaster risk reduction efforts, efficient emergency response and effectual recovery. The programs outlined in the DM Plan are formulated based on the vision and mission of Indonesian disaster management and the plan of action according to risk management. In its implementation the DM Plan needs to be integrated into regular development plans as stipulated by Article 35 sub d of Law No. 24 Year 2007 on Disaster Management.

1.2 OBJECTIVES

The Objectives of the National Disaster Management Plan 2010-1014 are as the following:

1. To identify hazard prone and high risk areas in Indonesia and formulate actions that should be prioritized, including the programs, priority focuses and indicative budget.
2. To provide a reference for government ministries and agencies, and all disaster management stakeholders in Indonesia in order that they could implement their disaster management efforts in a planned, integrated, coordinated and comprehensive manner.

1.3 POSITION OF DOCUMENT AND LEGAL BASIS

The National DM Plan is a cross-sectoral government plan that is effective for five years. The summary of the programs in the DM Plan will be integrated into the Middle-term National Disaster Management Plan (*Rencana Pembangunan Jangka Menengah Nasional*/RPJMN) that contains government development policies and programs and Government Work Plan. Specifically, disaster management planning

and activities will become key priorities in the RPJMN and integrated into development programs in the document. In this way, the National DM Plan will provide direction in the mainstreaming all disaster management policies and programs. By referring to the RPJMN, the government will annually formulate the Government's Work Plan (*Rencana Kerja Pemerintah*/RKP) as the detailed form and operationalization of the RPJMN that contain the regulatory framework, budget and detailed programs.

To ensure the implementation of the National DM Plan, the programs from the plan were integrated into RPJMN 2010-2014. National Government Ministries/Agencies will formulate their own Strategic Plan by referring to the disaster management programs in the National DM Plan and will elaborate their annual implementation through Ministries/Agencies' Work Plan. At the provincial and district/city levels, the plan and disaster management actions contained in the National DM Plan become a guideline and reference in disaster management planning in the regions that are integrated with development planning in the respective levels.

The legal basis for the formulation of the National DM Plan is Law No. 24 Year 2007 on Disaster Management, particularly Article 4 paragraph (3) that stipulates that the goal of disaster management is to "ensure the conduct of disaster management that is planned, integrated, coordinated, and comprehensive". Article 6 Law No. 24 Year 2007 also maintains that the responsibility of the Government in the conduct of disaster management includes the following:

(1) Disaster risk reduction and integration of disaster risk reduction efforts into development programs;

(2) Protection of the people from disaster impact;

(3) Assurance of the fulfillment of the rights of the people and displaced persons affected by disaster in a manner that is fair and in line with the minimum service standards;

(4) Recovery of condition from disaster impacts;

(5) Allocation of sufficient disaster management budget in the national budget (APBN);

(6) Allocation of disaster management budget in the form of on-call budget; and

(7) Maintenance of original and authentic archives/documents from disaster threats and impacts.

Article 35 letter a Law Number 24 Year 2007 on Disaster Management maintains that in a normal situation, the government has the task of conducting disaster management planning with a view of formulating a disaster management plan.

Further Article 36 paragraph (1) of the same law stipulates that disaster management planning is conducted by the government in line with its authority. Meanwhile, paragraph (2) stipulates that the formulation of the disaster management plan will be coordinated by BNPB/BPBD in accordance with their authority.

The preparation of the National DM Plan also refers to Law Number 32 Year 2009 on the Protection and Management of the Environment, Law Number 22 Year 2001 on Oil and Gas, Law Number 7 Year 2004 on Water Resources, Law Number 32 Year 2004 on Local Government, Law Number 27 Year 2007 on the Management of Coastal Areas and Small Islands, Law Number 26 Year 2007 on Spatial Planning, Law Number 4 Year 2009 on Mineral and Coal Mining and other related prevailing government regulations.

1.4 DRAFTING PROCESS

The drafting of the National DM Plan involves the participation of the multi-stakeholders, particularly from the line Ministries/Agencies and non-government organizations working in disaster management at the national level. The overall process of drafting was coordinated by the National Agency for Disaster Management (BNPB), while the stakeholders were involved in the many consultation and drafting sessions of the DM Plan. In the effort to mainstream the National DM Plan into the Middle-term Development Plan (RPJMN), BNPB will be supported by Bappenas as the agency tasked with the responsibility of managing national development.

In the formulation of the National DM Plan, an Advisory Group was formed, with members from relevant officials from the line Ministries/Agencies, supported by experts from practitioners and the university. The Advisory Group served as the steering committee of the overall hazard and vulnerability mapping, risk analysis and the drafting of the planned risk reduction programs at the national level. Members of the Advisory Group were selected based on their positions in the relevant line Ministries/Agencies and their expertise and/or participation in risk reduction initiatives.

Several technical groups were involved in the hazard and vulnerability analysis and risk mapping, in particular teams that had members coming from the university. In the future, it is expected that such drafting process will be developed, so that it will produce a standardized guideline for hazard and vulnerability mapping and disaster risk analysis. Further activities will be done through technical consultation that may involve the participation of the private sector and the academics, as has often been done in many other countries.

The multi-stakeholders, which include local government associations, non-government organizations, professional organizations and the private sector, the media as well as the wider public, have been involved in providing inputs for the formulation of the National DM Plan. This has been done through planning workshops, public consultations and many different public media.

The National DM Plan is a plan that has a timeframe of 5 (five) years, and it can be reviewed regularly every 2 (two) years or anytime in the event of a large-scale disaster (Government Regulation No. 21 Year 2008 Article 6 paragraph (5) and (6).

1.5 PRINCIPLE OF IMPLEMENTATION

The National DM Plan 2010-2014 is the manifestation of the government's commitment in disaster management as stipulated in the Decree of the Chief of BNPB. The National DM Plan comprises a guideline for Ministries/Agencies in formulating their Strategic Plans, for the preparation of the National Action Plan for Disaster Risk Reduction (NAP DRR) and for local governments in preparing their Local DM Plans and Local Middle-term Development Plan (RPJMD).

The principles for the implementation of the National DM Plan include the following:

1. Government ministries and agencies, local governments, communities and the private sector use the National DM Plan 2010-2014 as a reference;
2. Government ministries and agencies are responsible to formulate strategic plans with disaster risk reduction perspective in line with their tasks and functions by referring to the National DM Plan 2010-2014;
3. Local governments are responsible to formulate Local Disaster Management Plans that will serve as a reference in the formulation of the Strategic Plan of Local Government with due attention to the National DM Plan 2010-2014;
4. Government Ministries and Agencies are responsible to ensure the consistency between the National DM Plan 2010-2014 with their Strategic Plan in issues related to disaster;
5. Local governments are responsible to ensure the consistency between the National DM Plan 2010-2014 with the Local DM Plans and Local Middle-term Development Plans (RPJMD);
6. As part of the effort to increase the effectiveness of the National DM Plan 2010-2014 implementation, the National Agency for Disaster Management and the Ministry of National Development Planning/Agency for National Development

Planning is responsible for monitoring the elaboration of the National DM Plan 2010-2014 into the Strategic Plans of the Ministries/Agencies, the National Action Plan for Disaster Risk Reduction 2010-2012 and the Local Disaster Management Plans as well as the Local Middle-term Development Plans.

CHAPTER II
GENERAL OVERVIEW OF DISASTER

2.1 HAZARD

2.1.1 Earthquake

Indonesia is situated at the meeting points of three active plates, i.e. the Indo Australian plate to the south, the Euro Asian plate to the north and the Pacific plate in the east. The tree plates are moving and thrusting into each other in such a way that the Indo Australian plate thrusts under the Euro Asian plate. Moving northward the Indo Australian plate pushes into the Euro Asian plate that is moving southward and this creates a seismic line and a ring of active volcanoes along the Sumatra, Java, Bali and Nusa Tenggara Islands, turning north to the Mollucas and North Sulawesi, parallel with the subduction zones of the two plates.

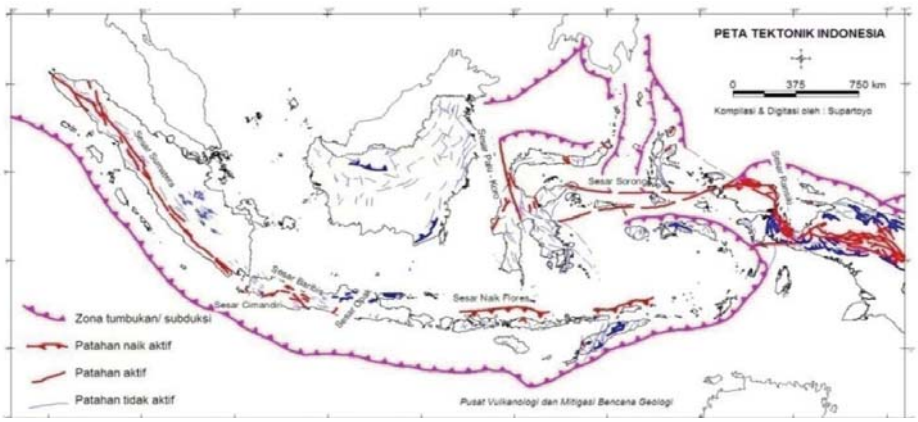


Figure 2.1 Map of Tectonic Plates and Distribution of Active Faults in Indonesia (Center for Vulcanology and Mitigation of Geological Hazards /PVMBG, 2008)

Earthquake-prone areas in Indonesia are distributed close to subduction zones and areas nearby active faults. Areas that are close to the subduction zones include the western coasts of Sumatra, southern coasts of Java, southern coasts of Bali and Nusa Tenggara, the Mollucas Island, North Mollucas, the north and east coasts of Sulawesi and the north coasts of Papua. Meanwhile, areas in Indonesia yang that are situated near active fault lines include areas along Bukit Barisan in Sumatra

Island, the Province of West Java, Central Java, the Special Region of Yogyakarta, East Java, Bali, West Nusa Tenggara, East Nusa Tenggara, Sulawesi Island, the Mollucas Islands and Papua Island. Some noted active faults in Indonesia include the Sumatra Fault, Cimandiri Fault, Lembang Fault, Baribis Fault, Opak Fault, Flores Back Arc Fault, Palu-Koro Fault, Sorong Fault, Ransiki Fault, active faults in Banten, Bali, Nusa Tenggara, the Mollucas Island and other active fault systems that have not been unveiled. Table 2.1. presents data about some earthquake incidents in Indonesia with mass casualties.

Table 2.1 Substantial casualties in several earthquake events in Indonesia (Center for Vulcanology and Mitigation of Geological Hazards/PVMBG, 2008)

No.	Year	Magnitude (Mw)	MMI	Killed (org)	Region
1.	1896	-	VIII	250	Timor Island
2.	1926	7,8	IX	354	West Sumatra
3.	1943	-	IX	213	Yogyakarta and Central Java
4.	1994	7	IX	l.207	Liwa, Lampung
5.	2000	7,9	X	100	Bengkulu
6.	2005	8,7	VIII	> 1.000	Nias Islands
7.	2006	6,2	VIII	> 5.700	Yogyakarta and Central Java

2.2.2 Tsunami Hazard

An earthquake that is generated by the interaction of the tectonic plates may caused deformation in the seabed that will further trigger huge sea waves and tsunami when happened in the ocean. With much regions of the country situated in areas that may be affected by tectonic plate movement, Indonesia becomes prone to tsunami hazard. Figure 2.2. presents tsunami incidents in Indonesia between 1801-2006.

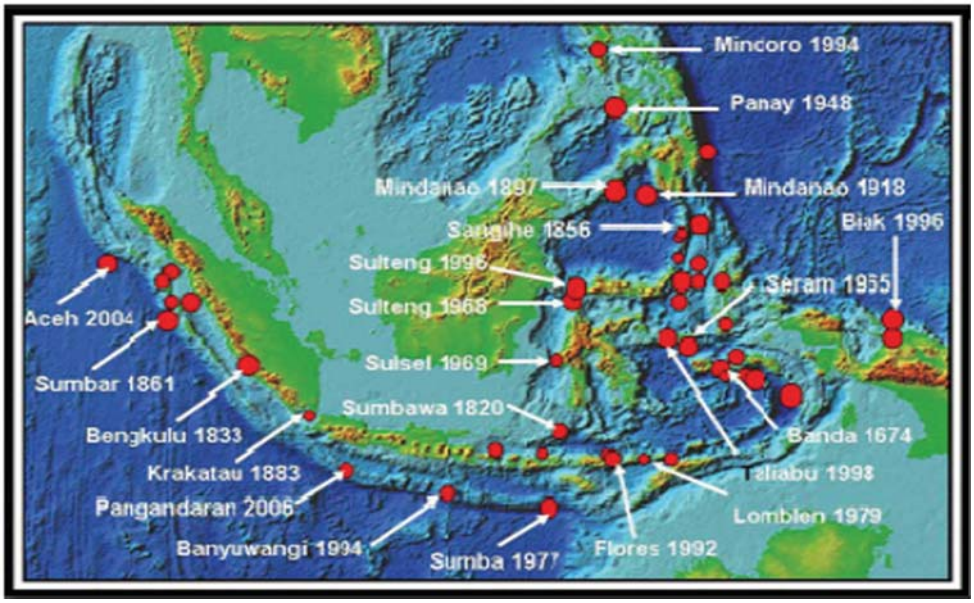


Figure 2.2 Map of tsunami disasters in Indonesia in 1801-2006 (Puspito, 2007)

Historical data of tsunami incidents in Indonesia in the period between 1600-1998 have been compiled from destructive earthquake (including tsunami) catalogue around the world by Utsu (1992). The data were compared with the data compiled by Berninghausen (1966, 1969), Cox (1970), Arnold (1985) and Ismail (1989), and later updated with more recent data about tsunami events. Based on these data, it is recorded that there has been 110 tsunami events, 100 of which were caused by earthquakes, 9 by volcanic eruption and 1 by landslide. Most data from year 1970 and earlier have not been well documented, while tsunami events occurred after 1970 have been researched and well reported.

2.2.3 Volcanic Eruption Hazard

Related to the major tectonic subduction zones outlined above, Indonesia has more than 500 volcanoes and 129 are active. The active volcanoes distributed in Sumatra Island, Java Island, Bali, Nusa Tenggara, North Sulawesi and the Mollucas Island constitute 13% of the world active volcano distribution.

Beside mega volcanic eruptions like the Tambora eruption that killed more than 92 thousand people and Krakatau that killed more than 36 thousand people in the XIX Century, based on data from the Center for Vulcanology and Mitigation of Geological Hazards (PVMBG, 2006) there are several other eruptions that caused many

casualties, among others are Kie Besi Volcano eruption in North Mollucas in 1760 that killed 2,000 people, Galunggung Volcano eruption in 1822 that killed 4,011 people and Papandayan Volcano eruption in 1772 that killed 2,951 people in West Java. In East Java the eruption of Kelud Volcano in 1919 killed 5,190 people and its 1966 eruption killed 210 people.

In Tomini Bay, Central Sulawesi in 1983 the Colo Volcano erupted hugely and burned approximately 2/3 areas of Unauna Island where the volcano is situated. Meanwhile in Yogyakarta the eruption of Merapi Volcano in 928 destroyed the Kingdom of Mataram, its 1872 eruption killed more than 3,000 people and the 1930 eruption killed 1,369 people.

Figure 2.3 presents the distribution of volcanoes in Indonesia. In the immediate future, special attention needs to be given to 70 volcanoes including Merapi Volcano, Soputan and Lokon. Based on history, Merapi Volcano in Yogyakarta has a short eruption cycle. The eruption has a similar pattern, i.e. the formation of lava dome, the lave dome collapsed and produced pyroclastic flows that affect areas surrounding the Merapi Volcano. Meanwhile, volcanic crater that needs special handling is the crater of Ijen Volcano and Dempo Volcano.

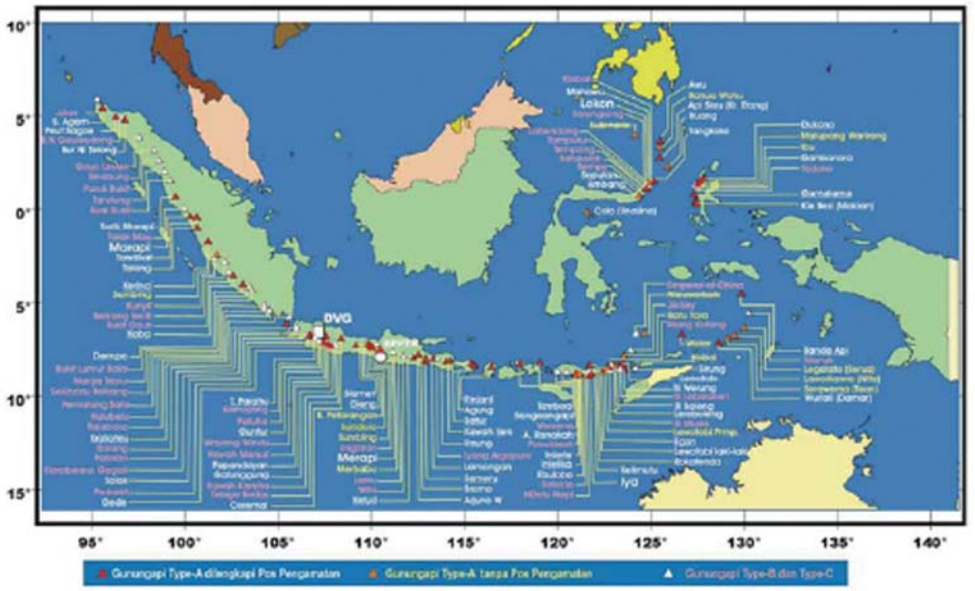


Figure 2.3 Distribution of volcanoes in Indonesia (PVMBG, 2007)

2.2.4 Land Mass Movement

In addition to facing earthquake, tsunami and volcanic eruption hazards, Indonesia geologically also faces land mass movement hazard or landslide. Nearly every year Indonesia experiences land mass movement that causes disaster. The biggest victims and most losses are experienced in debris flows or flash floods, like the one happened in Nias (2001) and Bohorok North Sumatra (2005), Central Sulawesi (2007), West Sumatra (2008) and the latest in Situ Gintung, Banten (2009), that made 82 people died, 103 lost, 179 people injured and 250 houses destroyed/ damaged. Nearly all major islands in Indonesia have districts and cities that are prone to land mass movement, except for Kalimantan Island that only has two districts that are prone to landslide; they are Murung Raya District in Central Kalimantan and Malinau District in East Kalimantan.

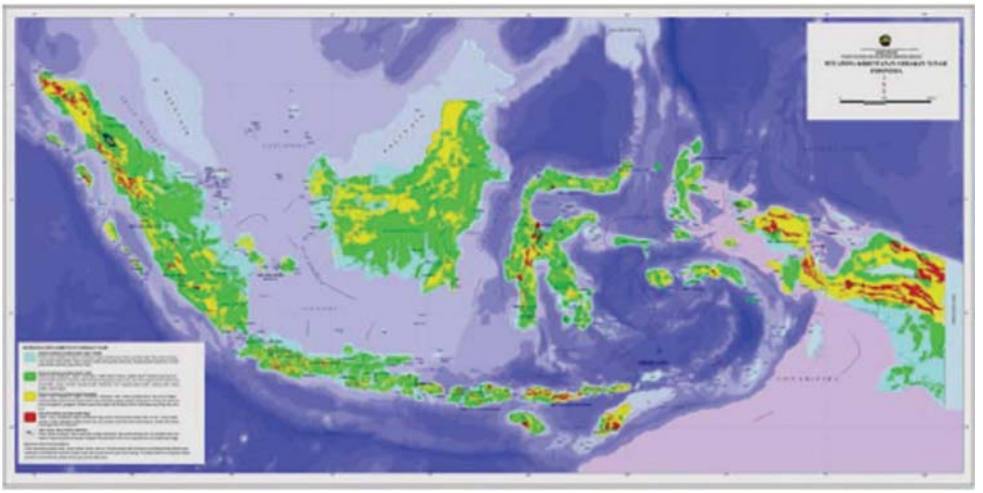


Figure 2.4 Map of landslide-prone zones in Indonesia (PVMBG, 2007).

Areas that have rough morphology with steep slopes are generally more prone to land mass movement. Besides, the condition of the rocks that is not compact and easily degraded may easily lead to land mass movement. This is often made worse by the high rainfall and earthquake events that frequently occur in Indonesia. In general the level of risk of land mass movement in Districts/Cities in Indonesia is determined by the mountain range. The level of risk is also influenced by the vulnerability of the other aspects such as population density and the people's vulnerability, the vulnerability of buildings and infrastructures, level of economy and the local capacity in general. Figure 2.4 presents the map of landslide-prone zones in Indonesia.

2.2.5 Flood Hazard

Geographically Indonesia is situated in the tropical zone that has two seasons, i.e. the hot season and rainy season, which are characterized with extreme change of weather, temperature and wind direction. The condition has the potential to create hydro-meteorological hazards such as flooding and drought. Areas with high risk of flooding are spread all throughout Indonesia, especially in the east coasts of the northern part of Sumatra Island, the north coasts of the western part of Java Island, western and southern parts of Kalimantan Island, the southern parts of Sulawesi Island and the southern parts of Papua. Several cities like Jakarta, Semarang and Banjarmasin suffer periodic flooding, and so are several big rivers such as Bengawan Solo in Java and Benanain River in East Nusa Tenggara.

Based on the source of water, excess water/flooding can be categorized into three: (a) Flood that is caused by heavy rain that exceeds the capacity of the water flow system that includes natural river system and man-made drainage system; (b) Flood that is caused by the increase in water level in the river due to tidal water or storm-related sea wave; and (c) Flood that is caused by the failure in man-made water buildings such as dams, embankments and flood control facilities.

Table 2.2 Flood events and impact (DIBI, BNPB)

Flood Events and Impact	2001/02	2002/03	2003/04	2004/05	Total
1. Number of events	150	186	143	182	661
2. Impact:					
2.1 Human casualties					
- killed	185	206	230	126.028	126,649
- lost	18	104	106	94,562	94,790
- evacuated	388,651	180,901	102,973	568.382	1,240,907
2.2 House damaged	57,087	58,285	54,479	72,346	242,197
2.3 Social/Public facilities	972	201	841	4760	6,774
2.4 Rice field (ha)	180,603	604,435	83,927	36,640	905,605
2.5 Road (km)	1,005	217	396	1,685	3,303

In general, flood is caused by above normal rainfall that makes the water flow system that consists of natural rivers and tributaries and drainage and canal system not able to receive the accumulation of rainwater and overflow. The capacity of the water drainage system is not always consistent, but can change as a result of sedimentation, narrowing of river basin due to natural or anthropogenic causes, clogged by garbage and various other factors. Deforestation in upstream areas

also contributes to the increase of the flood discharge because the volume of water that enters into the drainage system becomes too high and exceeding its retaining capacity. The lost of water catchment areas also increases the amount of surface water that directly goes to drainage system that in turn will exceed its capacity and cause flooding.

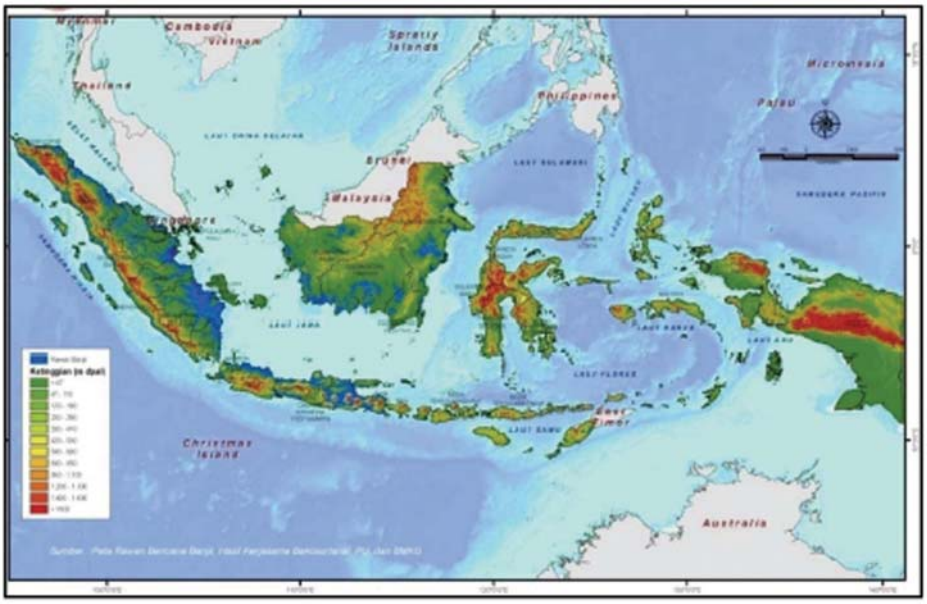


Figure 2.5 Flood-prone areas in Indonesia
(BMKG, Bakosurtanal, PU, 2008)

2.2.6 Drought Hazard

In addition to flood hazard, there is another hydro-meteorological hazard that often affects Indonesia, i.e. drought. Drought in this case is the substantial reduction of water availability to a point below normal that is temporary in nature, both in the atmosphere and in surface soil. Drought is caused by the decrease in rainfall in a long period that is caused by the interaction of the atmospheric and oceanic aspects and the irregularity of sea surface temperature related to the El Niño phenomenon. Drought leads to insufficiency of water availability for human activities. It also affects significantly crop pattern, water system, irrigation management and the management of other resources. Serious disruption in crop pattern will pose a threat to the people's food security.

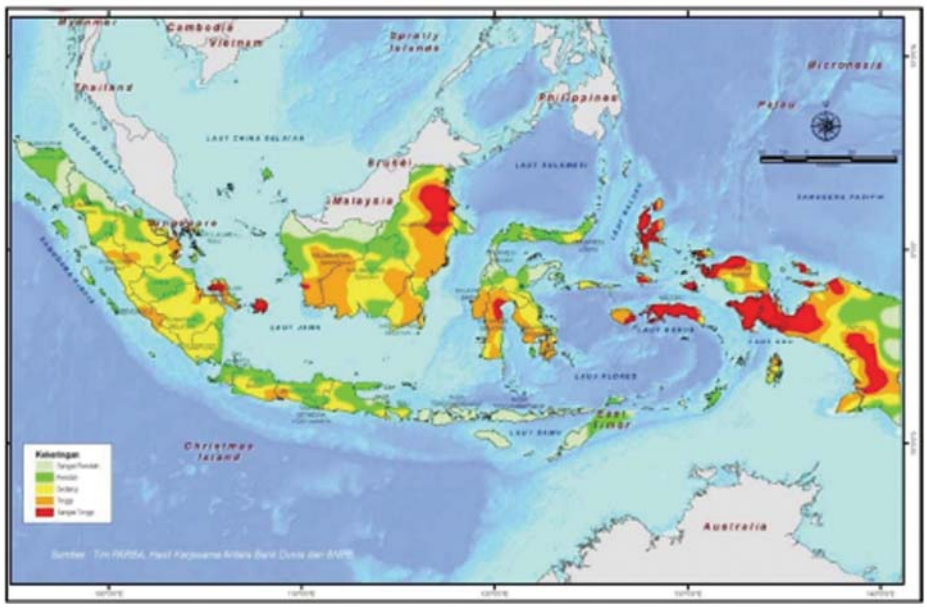


Figure 2.6 Drought-prone zone in Indonesia (BMKG)

Indonesian regions that are prone to drought include several districts/cities in West Sumatra, Riau, Jambi, South Sumatra, Bengkulu, Lampung, Bangka Belitung Islands, Riau Islands, nearly all districts/cities in Java Island, except for those situated in the easternmost part of Java Island, and several districts/cities in East Nusa Tenggara Province, West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, North Sulawesi, South Sulawesi, West Sulawesi, North Mollucas and Papua. Figure 2.6 presents drought-prone zones in Indonesia.

2.2.7 Forest and Land Fire Hazard

Related to the drought hazard, Indonesia also faces the threat of forest and land fire. Forest and Land Fires occur in Indonesia are mostly caused by human activities in clearing lands for farming, industrial forestry or plantation and this has been made worse by the phenomenon of El Niño Southern Oscillation (ENSO) that triggers drought. Forest fires cause many health-related problems as well as social-economic impacts. The haze created by forest fires may disturb neighboring countries and hence has the potential of upsetting the relations between Indonesia and its neighboring countries. Regions Indonesia that are prone to forest and land fires include Sumatra and Kalimantan Islands that have large areas of plantation and large scale farming as well as several districts/cities in Sulawesi, East Nusa Tenggara, and Java Island.

Table 2.3 Major forest and land fire events in Indonesia (Ministry of Forestry)

No.	Year	Region	Area Burned
1	1982/1983	East Kalimantan	3,600,000 ha
2	1987	Kalimantan, Sulawesi, Sumatra, Bali, Nusa Tenggara and Timor	66,000 ha
3	1991	Sumatra, Java, Bali, Nusa Tenggara, Kalimantan and Sulawesi	500,000 ha
4	1994	Sumatra and Kalimantan	5,400,000 ha
5	1997/1998	Sumatra, Java, Kalimantan, Sulawesi and Papua	9,750,000 ha
6	2006	Sumatra, Java, Bali, Nusa Tenggara, Kalimantan, Sulawesi and the Mollucas	32,198 ha

Figure 2.7 presents the level of risk to forest and land fire in Indonesia. Table 2.3 presents major forest and land fire events in Indonesia in the last decades. From the data it could be seen that all Indonesian major islands are prone to forest and land fires.

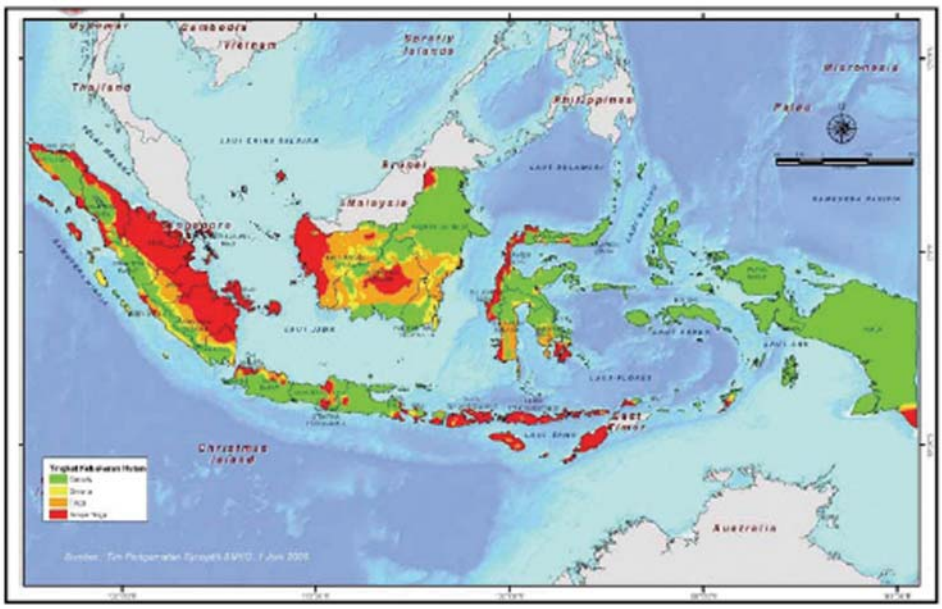


Figure 2.7 Zone of forest and land fire level in Indonesia (BMKG)

2.2.8 Erosion Hazard

Indonesia also faces erosion hazard, i.e. the change in land or rock formation that is caused by the power of water, wind, ice, gravitational force or living organisms. Erosion process may primarily cause the thinning down of soil layer and decrease in its fertility, because the soil particles that contain nutrients are carried by the run-off and deposited elsewhere. Erosion also damages river courses and causes the silting up of river beds and dams, and hence may affect the function and living age of the dams. Regions in Indonesia that are highly posed to erosion hazard include Sumatra, Java, Bali, Kalimantan, Sulawesi, Nusa Tenggara and the Mollucas and Papua Islands.

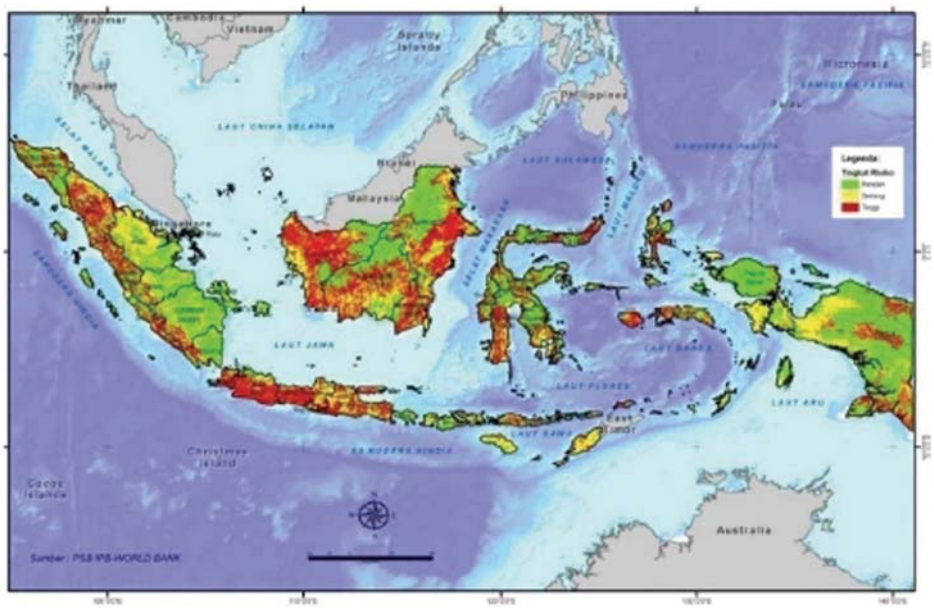


Figure 2.8 Erosion-hazard prone areas in Indonesia

2.2.9 Building and House Fire Hazard

Fires often raze buildings and houses in Indonesia, especially in the hot season. The hazard is caused by human errors in construction building and housing that does not comply with building security standards. Close circuit, cooking stove explosion, fire from candles or oil lamps that burns sleeping mattress and then the entire house, are common causes of fire in buildings and housings. Regions in Indonesia that needs to be careful to this hazard include areas around the greater Jakarta, Bogor, Tangerang District, Bekasi District, Depok and their surroundings that are densely populated. Attention should also be given to big cities that have

high population density such as Surabaya, Medan, Semarang, Bandung, Palembang, Padang, Pekanbaru, Makassar, Denpasar and other cities with similar density in addition to highly populated industrial zones that use oil and hazardous materials.

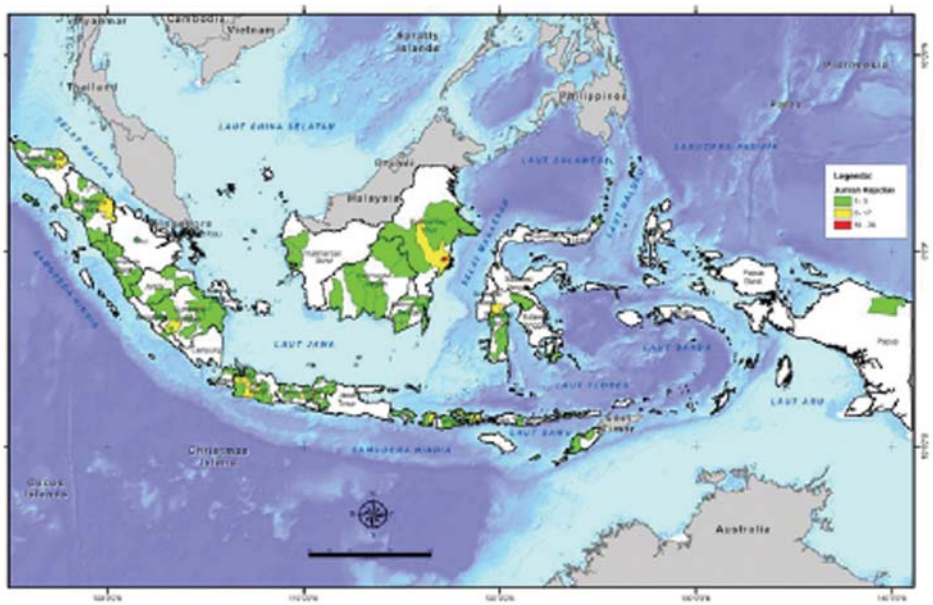


Figure 2.9 Map of fire incidents in building and house in Indonesia (DIBI-BNPB, 2007)

2.2.10 Extreme Wave and Abrasion Hazard

Related to the global climate change, Indonesia has increasingly become challenged by extreme waves and abrasion of its coastal areas. Extreme waves are usually caused by tropical cyclones. For areas south of the equator, the regions that have the potential to face extreme waves include the north coast of Java Island, Sumatra, West Nusa Tenggara and East Nusa Tenggara. For areas north of the equator, regions that face potential threat of extreme waves include the coastal areas of North Sulawesi, the Mollucas and Papua. Regions that face high abrasion risk include South Aceh and Banda Aceh City in Nanggroe Aceh Darussalam Province, Medan City, Padang City and Agam District in West Sumatra, North Jakarta City, Rembang District in Central Java Province, Sikka District in East Nusa Tenggara Province and Selayar District in South Sulawesi.

Extreme waves constitute one of the causes of rapid abrasion. Extreme waves that hit Indonesia usually happen in areas that are closed to tropical cyclone positions.

Figure 2.10 presents the position of tropical cyclone's appearance in Indonesia, and Figure 2.11 demonstrates the index of abrasion zones in Indonesia.

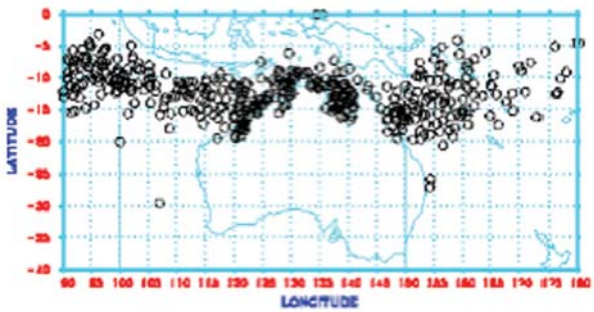


Figure 2.10 Position of tropical cyclone's appearance in Indonesia (BMKG)

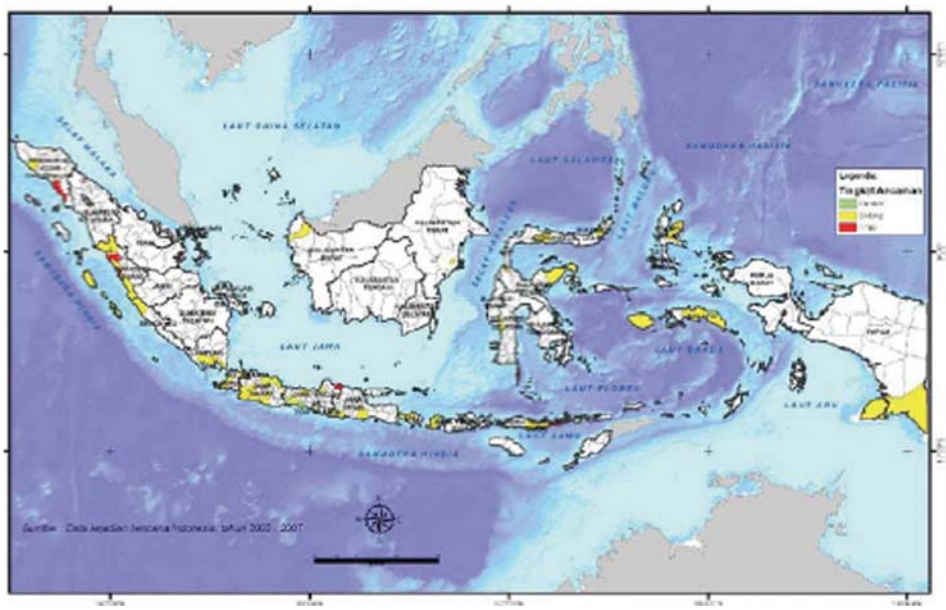


Figure 2.11 Index of abrasion zones in Indonesia (DIBI-BNPB, 2007)

2.2.11 Extreme Weather Hazard

Extreme weather such as whirlwind, typhoon and tropical cyclones has also started to affect Indonesia, particularly in relation to the increasing impact of the global climate change. The most frequently occurring hazard is whirlwinds that generally occur during the transition from the hot season to the rainy season or vice versa. The high velocity of whirlwinds can cause damages to light roofing, ballyhoos, electricity poles and trees.

Figure 2.12. shows areas in Indonesia that have the potential to experience tropical cyclones, and areas in east Indonesia are highly prone to tropical cyclones from the Australian continent.

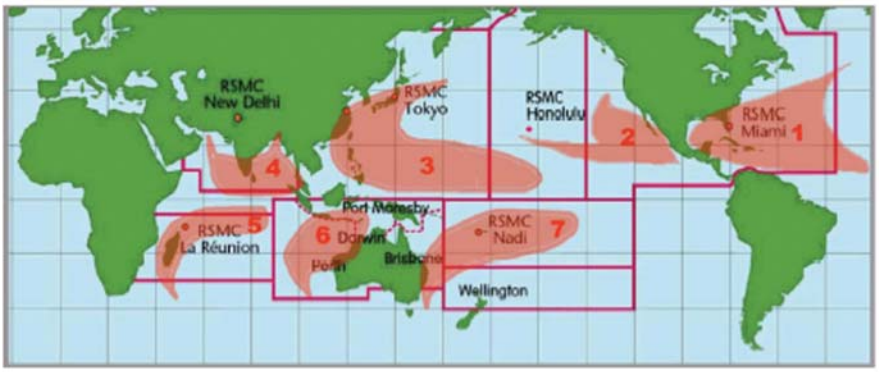


Figure 2.12 Regions prone to tropical cyclones

2.2.12 Technological Failure

Technological failure has also become a problem in Indonesia. This hazard can be caused by faulty design, mistake in the operation or human error in the use of technology. Such hazard may lead to fire, hazardous or radioactive material pollution, industrial accident, or transportation accident that kills people and damages properties. One of the technological failures that have triggered natural disaster whose impact can still be felt up to the present time is the drilling failure in Sidoarjo District that has led to massive mudflow from the earth. Mining accident like CH_4 gas explosion that occurred in coal mine P.T. Bukit Asam, Sawahlunto, West Sumatra, on 16 June 2009, killed 32 people and made 13 people injured.

With reference to technological failure, special attention needs to be given to the number of people killed and loss suffered by transportation accidents. Statistical data in 2008 from the Ministry of Transportation shows that traffic accident from the previous year amounts to 56,600 cases that involve more than 130,000 vehicles and killed 19,216 people, and the number of people injured is more than 75,000. The material losses of this are huge, along with the massive annual casualties, which in the last ten years has exceeded the number of 2004 Aceh-Nias Tsunami's casualties. Attention needs to be given to safety in the streets, by maintaining street condition that is safer and that can ensure the safety of users as well as encourage safe traffic practices.

2.2.13 Epidemics and Disease Outbreaks

Epidemics and disease outbreaks may potentially occur in Indonesia, particularly if we consider that many Indonesians are still living below the poverty line and cannot afford to lead a healthy and hygienic life. Disease outbreaks may threaten people as well as livestock and may have serious impacts such as death that further may lead to disruption of the economy. Several Avian Influenza cases have been identified in North and West Sumatra, Lampung, Banten, DKI Jakarta, West Java, Central Java and East Java.

In addition to Avian Influenza, Indonesia also faces diarrhea, dengue and malaria incidences. Table 2.4 shows the distribution of diarrhea patients during Extraordinary Events that are detailed based on time, location, number of sick people and number of deaths caused between 2001 and 2007.

Table 2.4 Distribution of diarrhea patients during extraordinary events 2001-2007

Year	Province	Sick People	Death	CFR (%)
2001	12	4,428	100	2.26
2002	15	5,789	94	1.62
2003	22	4,622	128	2.77
2004	17	3,314	53	1.60
2005	11	5,051	127	2.51
2006	16	10,980	277	2.52
2007	8	3,661	46	1.26

The number of districts/cities that experience dengue in Indonesia in the period of 1968-2006 tends to increase. The peak of the dengue fever occurred in 1973, 1988, 1998 and 2005. The number of districts/cities affected by the dengue fever continues to increase from 2002 to 2004 with the outbreak of dengue extraordinary events, and decreases a little bit in 2005 from 334 districts/cities to 326 districts/cities, but later increases again in 2006 to 330 districts/cities.

2.2.14 Social Conflict

Indonesia is a country that has multi ethnic groups with their many different languages and culture. This diversity constitutes richness but at the same time a

challenge because the country will often need to manage social frictions, which when not managed well may transform into social conflicts. Difference in faiths and the stark gap in prosperity level may be exploited by irresponsible parties to trigger social conflict such as has happened in Ambon, Poso District, West Kalimantan and several other places. Election of local governors or district heads or city mayors has also recently become something sensitive that could lead to conflict and unrest between supporters of candidate leaders. In some places this dispute may extend until long after the election has been completed and the leader elected.

Man-made social conflict may interact with one or more natural hazards such as volcanic eruption, flood or forest fire. This situation may lead to complex emergency. Social conflict and complex emergency need immediate and correct handling. Any late action in dealing with this situation may further lead to escalation of the intensity and area of conflict. In both situations, special attention needs to be given to minority groups that usually are most affected by the adverse situation. The National DM Plan needs to discuss the issue of social conflict and complex emergency by studying social vulnerability to conflict in Indonesia, including by examining past conflict incidences in the country.

2.2 VULNERABILITY AND CAPACITY

One factor that determines the level of vulnerability is the distance of a community to the source of hazard. Thus, areas most prone to volcanic eruption are those situated near the top and on the slopes of a volcano. Such areas generally attract people because the soil is fertile, water sources are easy to get and the scenery is usually beautiful, so that people are fond of living and doing their activities there. In Indonesia, up to the present time, it is recorded that more than 5 million people are living around volcanoes (PVMBG, 2007). They are vulnerable communities because they live too close to the source of hazard. The case is also true for the other hazards: communities that are vulnerable to tsunami are those who live in coastal areas near subduction zones of major tectonic plates; those vulnerable to earthquake are communities who live near active faults; people vulnerable to land mass movement are those living in unstable slopes; and communities vulnerable to flood are those who live in river banks or areas that used to be flood plains.

The other vulnerability factors include population density, whereas Indonesia is categorized among the highly populated countries. The total number of Indonesian citizens based on data from Podes year 2008 is 231,640,960 with a population growth of 1.3% in the period of 2000-2005. One of the big problems faced by the

country is the uneven distribution of its people in its many islands. Table 2.5. shows the distribution of land area percentage and Indonesian population by islands.

Table 2.5 Distribution of land area percentage and Indonesian population by island

Island	Land Area (%)	Population (%)						
		1930	1961	1971	1980	1985	1990	2008
1. Java - Madura	6.9	65	68.7	63.8	61.9	60.9	60	58.3
2. Sumatra	24.7	16.2	13.5	17.5	19	19.9	20.3	21.3
3. Kalimantan	28.1	4.2	3.6	4.4	4.5	4.7	5.1	5.6
4. Sulawesi	9.9	7.3	6.9	7.1	7.1	7	7	7.2
5. Others	30.4	7.3	7.3	7.2	7.5	7.5	7.6	7.6
6. Total	100	100	100	100	100	100	100	100

Source: collated from BPS data

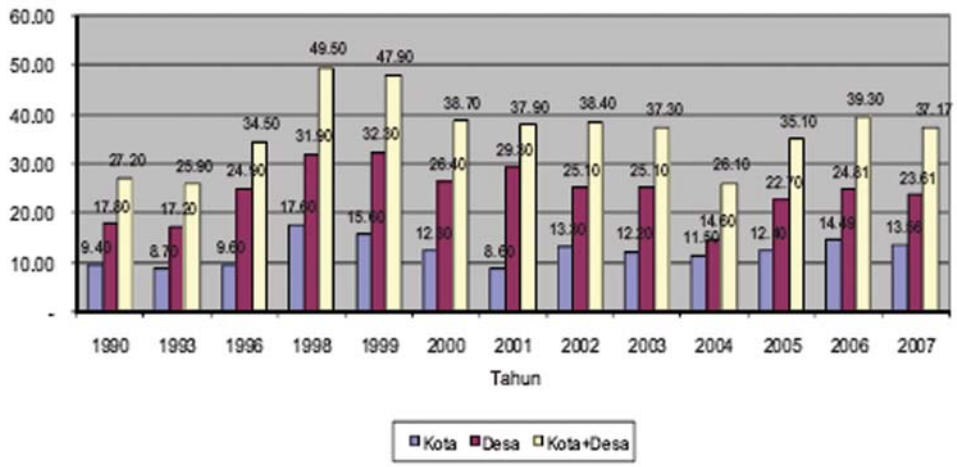
Table 2.5. shows that nearly two thirds of Indonesian population (58,3%) live in Java and Madura Islands, that only constitute 6.9% of the entire land areas of Indonesia. In addition to that, there is high concentration of the population in the greater Jakarta that has a population density of 10,852 people per km^2 in 2008. At the same time the average population density of Indonesia is only 124 people per km^2, and for Papua Province it is only 7 people and for West Papua Province it is 8 people, as the two provinces are the least populated areas in the country.

The concentration of people in Java and Madura Islands, followed by Sumatra Island, creates vulnerability because Java Island faces many natural hazards including earthquake and volcanic eruption, in addition to facing also potential social conflicts. With the limitation of the supporting resources and environment, limited job opportunity available, and the blending of multi-ethnic and multi-cultural communities in these major islands, the potential for social conflicts become very much higher. This has also been made worse by the relatively high population growth, that when not well managed will also contribute to the potential escalation of social conflicts in Indonesia.

The other vulnerability factor is poverty, whereas socially and economically Indonesia still faces the problem of poverty. Latest data from the Statistics Agency (BPS) maintain that currently Indonesia has 37,168,300 poor people. The number of poor people living in rural areas in Indonesia is bigger than those in the urban areas. However, in the period of 1978-2006, the number of poor people living in urban

centers continues to grow and on the contrary, the number of the poor who live in rural areas tends to decrease. This is caused by growing urbanization. Many unskilled people from the villages go to big cities to look for jobs, so that the number of poor people in cities increases. This tendency needs to be managed well because poverty in urban areas may interact with high level of hazard and hence create a highly risky situation. East Java Province has the biggest number of poor people, it is recorded that by July 2006 it reached 7.4 million people or 20.29 %, while the province that has the biggest percentage of poor residents is Papua Province with 39.26 % of the total population. It is assumed that areas with many poorer residents are less than able to cope with hazards since they do not have sufficient financial capacity to implement disaster prevention and mitigation measures.

Table 2.6 Distribution of poor people in urban and rural areas 1990-2007 (BPS, 2007)



Data from Statistics Indonesia year 2007 maintains that from the level of education, the rate of literacy for Indonesian adult population in 2007 is 91.87 %, while the average schooling years of Indonesians is 7.47 years. This average length of schooling years is equal to the level up to junior high school. In other words, until 2007 the obligatory basic schooling program has yet to reach its goal. It is assumed that the higher the education of the communities, the less vulnerable the communities will be to disaster.

From the health aspect, the life expectancy of Indonesians is 68.7 years. Infant mortality rate for 2005 is 32 deaths per 1000 life births. From the economic aspect, the Gross Domestic Product per capita of Indonesia in 2007 is Rp 15,628,050.

Meanwhile, from the viewpoint of the people's expenditure, the per capita real expenditure in 2007 is Rp 624,370.

The vulnerability of an area and its people to a certain hazard may take the form of physical vulnerability and/or social and economic vulnerability. Related to the social-economic factors, the basis for the calculation of vulnerability index in the National DM Plan employs, among others, economic growth, local revenues, regional gross domestic product (PDRB), population density and total population, level of education, health, poverty and employment indicators. Social-economic vulnerability is more generic in nature and applies to nearly most hazards. Physical vulnerability is more specific, depending on the type of hazard and each hazard uses specific indicators, for instance tsunami code for tsunami, building code indicator for earthquake, people living in hazard prone areas for volcanic eruption hazard, and so forth.

In terms of capacity in facing disaster, Indonesia still needs to develop itself. Considered from the viewpoint of the institutional arrangement, the capacity of the country has been much improved with the enactment of Law Number 24 Year 2007 on Disaster Management that stipulates the establishment of an independent body that manages disaster. With the set-up of BNPB at the central level and BPBD at the provincial and district/city level, disaster management initiatives can be managed in a more directed, integrated and comprehensive manner. However, further work needs to be done to realize a really independent DM body that is able to coordinate the other institutions and that is manned by competent staff members, possesses sufficient resources and budget, and is supported with accommodating policies.

The capacity of the people can also be seen from the capability of the communities in dealing with the adverse impacts of disaster, including by implementing actual measures to reduce disaster risks. The capacity of the people is high if they are able to build houses and housing that comply with safe building standards, and if they possess assets or sufficient resources that could be use in time of crisis or in facing an extreme situation. Such kind of communities know what hazards they are facing and how to reduce the risks posed by these hazards, through regular disaster simulation, development of community-based early warning system and disaster prepared groups. The presence of local knowledge in disaster management, social network and strong community organizations, mutual self-help culture and solidarity can also build the capacity to deal with disaster.

Several universities have developed disaster management centers or relevant other research centers such as Bandung Institute for Technology, Gadjah Mada University, Surabaya Institute for Technology, Veteran National Development University

Yogyakarta, Jember District University, Bogor Institute for Agriculture, Andalas University, Airlangga University, Tadulako University and Syiah Kuala University. It is expected that such kind of agencies can support the capacity building of local governments for disaster management. The existence of community organizations that implement disaster management initiatives has also the potential to contribute to the local capacity in managing disaster. At the national level there is the Consortium for Disaster Education (CDE), the National Platform for DRR (Planas PRB), and similar other disaster risk reduction forums. It is expected that the establishment of such forums will increase the capability in managing disaster at the central as well as regional and local levels.

2.3 DISASTER RISK

2.3.1 Earthquake Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for earthquake in Indonesia (Annex 2), the disaster management plan for earthquake in the forthcoming five years will be focused on areas outlined in Table 2.7.

Table 2.7 Distribution of high risk zones for earthquake

PROVINCE	DISTRICT/CITY
Nanggroe Aceh Darussalam	West Aceh District Southwest Aceh District Aceh Besar District Aceh Jaya District South Aceh District Aceh Singkil District Central Aceh District Southeast Aceh District Bireun District Gayo Lues District Banda Aceh City Sabang City Nagan Raya District Pidie District

	Pidie Jaya District Simeuleu District
North Sumatra	Dairi District Humbang Hasundutan District Karo District Sibolga City Langkat District Mandailing Natal District Nias District South Nias District Padang Sidempuan District Samosir District South Tapanuli District Central Tapanuli District North Tapanuli District Agam District Mentawai Island District Bukit Tinggi City Padang City Padang Panjang City Pariaman City Solok District City South Solok District Tanah Datar District
West Sumatra	Kerinci District
South Sumatra	Empat Lawang District Pagar Alam City Lahat District South OKU District
Bengkulu	South Bengkulu District North Bengkulu District Kaur District Kepahiang District Bengkulu City Lebong District Muko-muko District Rejang Lebong District Seluma District

Lampung	Bandar Lampung City West Lampung District South Lampung District East Lampung District North Lampung District Tanggamus District
West Java	Bandung District West Bandung District Bogor District Ciamis District Cianjur District Garut District Bandung City Cimahi City Sukabumi City Sukabumi District Tasikmalaya District
Central Java	Cilacap District Kebumen District Wonogiri District
Special Region of Yogyakarta	Bantul District Gunung Kidul District Kulon Progo District
East Java	Banyuwangi District Blitar District Jember District Kediri District Lumajang District Malang District Pacitan District Pasuruan District Ponorogo District Probolinggo District Situbondo District Sumenep District Trenggalek District Tulungagung District

Banten	Cilegon City Lebak District Pandeglang District Serang District Tangerang District
Bali	Badung District Buleleng District Gianyar District Jembrana District Karang Asem District Klungkung District Denpasar City Tabanan District Bangli District
West Nusa Tenggara	Bima District Dompu District Bima City Mataram City West Lombok District Central Lombok District East Lombok District Sumbawa District West Sumbawa District
East Nusa Tenggara	Belu District Ende District East Flores District Kupang City Kupang District Manggarai District West Manggarai District Negekeo District Ngada District Rote Ndao District Sikka District West Sumba District Southwest Sumba District Central Sumba District East Sumba District

	South Central Timor District North Central Timor District
East Kalimantan	East Luwu District
	Bolaang Mongondow District North Bolaang Mongondow District Sangihe Island District Sitaro Island District Talaud Island District Bitung City Manado City Minahasa District South Minahasa District Southeast Minahasa District North Minahasa District
North Sulawesi	Banggai District Banggai Island District Buol District Donggala District Palu City Morowali District Parigi Moutong District Poso District Tojo Unauna District Tolitoli District Boalemo District
Central Sulawesi	Bone Bolango District Gorontalo District North Gorontalo District Gorontalo City Pohuwato District
Gorontalo District	Buru District Ambon City Central Mollucas District South East Mollucas District West Seram District East Seram District

West Papua	Manokwari District Raja Ampat District
Papua	Biak Numfor District Jayawijaya District Jayapura District Keerom District Jayapura City Nabire District Bintang Mountain District Sarmi District Supiori District Tolikara District Waropen District Yapen Waropen District

2.3.2 Tsunami Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for tsunami in Indonesia (Annex 2), the disaster management plan for tsunami in the forthcoming five years will be focused on areas outlined in Table 2.8.

Table 2.8 Distribution of high risk zones for Tsunami

PROVINCE	DISTRICT/CITY
Nanggroe Aceh Darussalam	Aceh Besar District Aceh Jaya District West Aceh District Nagan Raya District South Southwest Aceh South Aceh District Aceh Singkil District SubulussallamCity
North Sumatra	Mandailing Natal District Nias District South Nias District Sibolga City
West Sumatra	Padang Pariaman District Agam District

West Sumatra	West Pasaman District Mentawai Island District Pesisir Selatan District Padang Panjang City Padang City
Bengkulu	Mukomuko District South Bengkulu District North Bengkulu District Seluma District Kaur District Bengkulu City
Lampung	South Lampung District West Lampung District Tanggamus District Bandar Lampung City
Banten	Pandeglang District Serang District Lebak District Cilegon City
West Java	Sukabumi District Cianjur District Garut District Ciamis District Tasikmalaya District Banjar City
Central Java	Cilacap District Purworejo District Kebumen District Wonogiri District
Special Region of Yogyakarta	Bantul District Kulonprogo District Gunung Kidul District
East Java	Lumajang District Banyuwangi District Trenggalek District Tulungagung District Pacitan District Blitar District

	Jembe District Malang District
Bali	Badung District Tabanan District Jembrana District Karangasem District Klungkung District Gianyar District
West Nusa Tenggara	East Lombok District West Lombok District Sumbawa District Bima District Dompu District Bima City
East Nusa Tenggara	Kupang District South Central Timor District Sikka District Ende District Ngada District Manggarai District West Manggarai District East Flores District Lembata District Alor District North Central Timor District Belu District Rote Ndao District East Sumba District West Sumba District
East Kalimantan	Paser District North Penajem Paser District Berau District Kutai Kertanegara District East Kutai District Balikpapan City Bontang City
South Kalimantan	Kotabaru District Tanah Laut District

	Tanah Bumbu District
West Sulawesi	Majene District North Mamuju District
Central Sulawesi	Banggai District Buol District Donggala District Poso District Tolitoli District Parigi Moutong District Tojo Unauna District Morowali District
North Sulawesi	Bolaang Mongondow District Minahasa District South Minahasa District Sangihe Island District Talaud Island District
Southeast Sulawesi	Buton District Konawe District South Konawe District Kolaka District North Kolaka District Muna District Bombana District Wakatobi District
South Sulawesi	Sinjai District Bantaeng District Bulukumba District Bone District Jeneponto District Takalar District Wajo District Luwu District North Luwu District East Luwu District
Gorontalo District	Gorontalo District Boalemo District Pohuwato District Bone Bolango District

Mollucas	Central Mollucas District West Seram District East Seram District Southeast Mollucas District Western Southeast Mollucas District Buru District
North Mollucas	West Halmahera District Tidore Island District Sula Island District East Halmahera District North Halmahera District
West Papua	Fakfak District Sorong District Manokwari District Kaimana District
Papua	Jayapura District Merauke District Nabire District Biak Numfor District Yapen Waropen District Sarmi District

2.3.3 Volcanic Eruption Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for volcanic eruption in Indonesia (Annex 2), the disaster management plan for volcanic eruption in the forthcoming five years will be focused on areas outlined in Table 2.9.

Table 2.9 Distribution of high risk zones for volcanic eruption

PROVINCE	DISTRICT/CITY
Nanggroe Aceh Darussalam	Aceh Besar District Bener Meriah District Sigli District Central Aceh District
North Sumatra	Karo District

	Kabanjahe District South Tapanuli District
West Sumatra	Agam District West Pasaman District Solok District Tanah Datar District
Jambi	Kerinci District Merangin District
South Sumatra	Lahat District Muara Enim District Musi Rawas District
Bengkulu	Rejang Lebong District
Lampung	West Lampung District South Lampung District Tanggamus District
West Java	Bandung District West Bandung District Bogor District Cianjur District Garut District Kuningan District Majalengka District Sukabumi District Tasikmalaya District
Sentral Java	Banjarnegara District Banyumas District Boyolali District Brebes District Klaten District Magelang District Pemalang District Purbalingga District Tegal District Wonosobo District
Special Region of Yogyakarta	Sleman District
East Java	Banyuwangi District Blitar District Bondowoso District

	Mojokerto District Pasuruan District Probolinggo District
Banten	Pandeglang District Serang District
Bali	Bangli District Karang Asem District Badung District
West Nusa Tenggara	Bima District East Lombok District Dompu District
Bengkulu	Ende District East Flores District Manggarai District West Manggarai District Ngada District Sikka District Kalabahi District
North Sulawesi	Bitung City Minahasa District South Minahasa District North Minahasa District Tomohon City Talaud Island District Sangihe District
Mollucas	Central Mollucas District Western Southeast Mollucas District West Seram District
North Mollucas	West Halmahera District North Halmahera District Ternate City

2.3.4 Land Mass Movement Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for land mass movement in Indonesia (Annex 2), the disaster management plan for land mass movement in the forthcoming five years will be focused on areas outlined in Table 2.10.

Table 2.10 Distribution of high risk zones for land mass movement

PROVINCE	DISTRICT/CITY
Nanggroe Aceh Darrusalam	Southwest Aceh District Aceh Besar District Aceh Jaya District Central Aceh District Southeast Aceh District East Aceh District Bener Meriah District Bireun District Gayo Lues District Sabang City Nagan Raya District Pidie District Pidie Jaya District
North Sumatra	Dairi District Humbang Hasundutan District Karo District Sibolga City Langkat District Mandailing Natal District Nias District South Nias District Padang Sidempuan District Pakpak Bharat District Simalungun District South Tapanuli District North Tapanuli District Toba Samosir District
West Sumatra	Mentawai Island District Bukit Tinggi City Padang City Lima Puluh Koto District Pasaman District Solok District
Jambi	Kerinci District

South Sumatra	Empat Lawang District Lahat District South OKU District
North Bengkulu	North Bengkulu District Kaur District Kepahiang District Lebong District Rejang Lebong District
Lampung	Bandar Lampung City West Lampung District North Lampung District Tanggamus District
West Java	Bandung District West Bandung District Bogor District Ciamis District Cianjur District Garut District Sukabumi City Kuningan District Sukabumi District Sumedang District Tasikmalaya District
East Java	Banjarnegara District Banyumas District Pekalongan District Purbalingga District Wonosobo District
East Java	Batu City Pacitan District Pasuruan District Probolinggo District Sumenep District Trenggalek District
Banten	Lebak District
Bali	Bangli District Buleleng District Jembrana District

	Karang Asem District Tabanan District
West Nusa Tenggara	Bima District Dompu District Bima City West Lombok District East Lombok District Sumbawa District
East Nusa Tenggara	Belu District Ende District East Flores District Kupang District Manggarai District West Manggarai District Negekeo District Ngada District Sikka District East Sumba District South Central Timor District North Central Timor District
Central Kalimantan	Murung Raya District
East Kalimantan	Malinau District
North Sulawesi	Bolaang Mongondow District North Bolaang Mongondow District Sitaro Island District Bitung City Tomohon City Kotamobagu District Minahasa District South Minahasa District North Minahasa District
Central Sulawesi	Banggai District Banggai Island District Buol District Donggala District Palu City Morowali District

	Parigi Moutong District Poso District Tojo Unauna District Tolitoli District
South Sulawesi	Bone District Enrekang District Gowa District Palopo City Luwu District East Luwu District North Luwu District Pinrang District Sinjai District Soppeng District Tana Toraja District
Southeast Sulawesi	North Kolaka District Konawe District Utara Kendari City
Gorontalo District	Bone Bolango District Gorontalo District
West Sulawesi	Majene District Mamasa District Mamuju District Polewali Mandar District
Mollucas	Buru District Central Mollucas District
North Mollucas	Tidore District
West Papua	Kaimana District Sorong City Manokwari District Raja Ampat District Sorong District Teluk Wondama District
Papua	Jayawijaya District Jayapura District Keerom District Jayapura City Nabire District

	Paniai District Bintang Mountain District Puncak Jaya District Sarmi District Tolikara District Yahukimo District Yapen Waropen District

2.3.5 Flood Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for flood in Indonesia (Annex 2), the disaster management plan for flood in the forthcoming five years will be focused on areas outlined in Table 2.11.

Table 2.11 Distribution of high risk zones for flood

PROVINCE	DISTRICT/CITY
Nanggroe Aceh Darussalam	Aceh Besar District Aceh Tamiang District East Aceh District North Aceh District Bireun District Banda Aceh City Langsa City Lhoksumawe City
North Sumatra	Nagan Raya District Asahan District Batubara District Deli Serdang District Medan City Tanjung Balai City Labuhan Batu District Langkat District Mandailing Natal District Serdang Bedagai District South Tapanuli District Central Tapanuli District

	Agam District West Pasaman District Padang City
Riau	Kampar District Kuantan Singingi District Pekanbaru District Pelalawan District Rokan Hulu District Siak District
Jambi	Batanghari District Jambi City Muaro Jambi District West Tanjung Jabung District East Tanjung Jabung District
South Sumatra	Palembang City Prabumulih City Lahat District Musi Banyuasin District Musi Rawas District Ogan Komering Ilir District
Lampung	Central Lampung District Tulangbawang District
Bangka Belitung Island	Belitung District East Belitung District
DKI Jakarta	West Jakarta City Central Jakarta City South Jakarta City East Jakarta City North Jakarta City
West Java	Bekasi District Ciamis District Cirebon District Indramayu District Karawang District Banjar City

	Bekasi City Bandung City Bandung District Majalengka District Purwakarta District Subang District Sumedang District
Central Java	Banyumas District Brebes District Cilacap District Demak District Grobogan District Jepara District Kebumen District Kendal District Pekalongan City Semarang City Tegal City Kudus District Pati District Pekalongan District Pemalang District Purworejo District Semarang District Tegal District
Special Region of Yogyakarta	Bantul District Kulon Progo District
East Java	Bangkalan District Banyuwangi District Bojonegoro District Gresik District Jombang District Pasuruan City Mojokerto City Surabaya City Lamongan District Lumajang District

	Malang District Mojokerto District Pasuruan District Sidoarjo District Situbondo District Tuban District Trenggalek District
Banten	Tangerang City Serang District Tangerang District
Bali	Klungkung District Denpasar City
West Nusa Tenggara	Bima District Dompu District Bima City Mataram City West Lombok District
East Nusa Tenggara	Belu District Ende District Kupang District West Manggarai District Negekeo District Ngada District South Central Timor District North Central Timor District
West Kalimantan	Bengkayang District Kapuas Hulu District North Kayong District Ketapang District Pontianak City Singkawang City Pontianak District Sambas District Sanggau District Sekadau District Sintang District
Central Kalimantan	Kota Waringin Timur Sukamara District

South Kalimantan	Banjar District Barito Kuala District Hulu Sei Selatan District Banjarbaru District Banjarmasin District Tanah Bumbu District Tanah Laut District Tapin District
East Kalimantan	Bulungan District Tarakan City
North Sulawesi	Manado City
South Sulawesi	Bone District Gowa District Makassar City Palopo City Luwu District East Luwu District North Luwu District Maros District Pangkajene Island District Pinrang District Sidenreng Rappang District Soppeng District Takalar District Tana Toraja District Wajo District
Southeast Sulawesi	Buton District North Buton District South Konawe District Baubau City
Gorontalo District	Boalemo District
West Sulawesi	Polewali Mandar District
Mollucas	Central Mollucas District Western Southeast Mollucas District West Seram District
West Papua	Sorong City Sorong District South Sorong District

	Asmat District Boven Digoel District Jayapura City Mappi District Merauke District Mimika District Nabire District Waropen District

2.3.6 Drought Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for drought in Indonesia (Annex 2), the disaster management plan for drought in the forthcoming five years will be focused on areas outlined in Table 2.12.

Table 2.12 Distribution of high risk zones for drought

PROVINCE	DISTRICT/CITY
West Sumatra	Agam District Bukit Tinggi City Padang City Pariaman City Payakumbuh City
Riau	Padang Pariaman District Indragiri Hilir District Pekanbaru District Pelalawan District Siak District
Jambi	Bungo District Jambi City West Tanjung Jabung District
South Sumatra	Banyuasin District Lubuk Linggau City
Bengkulu	North Bengkulu District
Lampung	Bandar Lampung City Metro City South Lampung District Central Lampung District

	East Lampung District North Lampung District Tanggamus District Tulangbawang District Way Kanan District
Bangka Belitung Island	Bangka District West Bangka District Central Bangka District Belitung District East Belitung District Pangkal Pinang City
Riau Island	Bintan District Karimun District Batam City Tanjung Pinang City
DKI Jakarta	West Jakarta City Central Jakarta City South Jakarta City East Jakarta City, North Jakarta City
West Java	Bandung District West Bandung District Bekasi District Bogor District Cianjur District Cirebon District Garut District Karawang District Bandung City Banjar City Bekasi City Bogor City Cimahi City Cirebon City Depok City Sukabumi City Tasikmalaya City Majalengka District

	Purwakarta District Subang District Sukabumi District Sumedang District Tasikmalaya District
Bangka Belitung Island	Banjarnegara District Banyumas District Batang District Blora District Boyolali District Brebes District Cilacap District Demak District Grobogan District Jepara District Karanganyar District Kebumen District Kendal District Klaten District Magelang City Pekalongan City Salatiga City Semarang City Surakarta City Tegal City Kudus District Magelang District Pati District Pekalongan District Pemalang District Purbalingga District Purworejo District Rembang District Semarang District Sragen District Sukoharjo District Tegal District Temanggung District

	Wonogiri District Wonosobo District
Special Region of Yogyakarta	Gunungkidul District Kulon Progro District
East Java	Bojonegoro District Jombang District Kediri District Kediri City Madiun City Malang City Madiun District Magetan District Nganjuk District Ngawi District Pacitan District Pamekasan District Pasuruan District Ponorogo District Probolinggo District Sumenep District Trenggalek District Tuban District Tulungagung District
Banten	Cilegon City Tangerang City Pandeglang District Serang District Tangerang District
East Nusa Tenggarga	Southwest Sumba District Belu District Ende District Kupang District West Manggarai District Negekeo District Ngada District South Central Timor District North Central Timor District

West Kalimantan	Ketapang District Pontianak City
Central Kalimantan	West Kotawaringin District East Kotawaringin District
South Kalimantan	Hulu Sei Tengah District Kotabaru District Tabalong District Tanah Laut District
East Kalimantan	Balikpapan City Bontang City Samarinda City Tarakan City Kutai Kertanegara District East Kutai District
North Sulawesi	Manado City
South Sulawesi	Makassar City Pangkajene Island District
West Sulawesi	Polewali Mandar
North Mollucas	Tidore District
Papua	Sorong City

2.3.7 Forest and Land Fire Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for forest and land fires in Indonesia (Annex 2), the disaster management plan for forest and land fires in the forthcoming five years will be focused on areas outlined in Table 2.13.

Table 2.13 Distribution of high risk zones for forest and land fires

PROVINCE	DISTRICT/CITY
Nanggroe Aceh Darrusalam	West Aceh District Southwest Aceh District Aceh Besar District Aceh Jaya District South Aceh District Aceh Singkil District

	Aceh Tamiang District Central Aceh District Southeast Aceh District East Aceh District North Aceh District Bener Meriah District Bireun District Nagan Raya District Pidie District Pidie Jaya District Simeuleu District
North Sumatra	Asahan District Batubara District Dairi District Deli Serdang District Humbang Hasundutan District Karo District Labuhan Batu District Langkat District Mandailing Natal District Nias District South Nias District Padang Sidempuan District Pakpak Bharat District Serdang Bedagai District Simalungun District South Tapanuli District Central Tapanuli District North Tapanuli District Toba Samosir District
West Sumatra	Dharmasraya District Lima Puluh Koto District Pasaman District West Pasaman District Pesisir Selatan District Sawahlunto Sijunjung District
Riau	Bengkalis District Indragiri Hilir District

	Indragiri Hulu District Kampar District Kuantan Singingi District Pekanbaru District Pelalawan District Rokan Hilir District Rokan Hulu District Siak District
Jambi	Batanghari District Bungo District Kerinci District Merangin District Muaro Jambi District Sarolangun District West Tanjung Jabung District East Tanjung Jabung District Tebo District
South Sumatra	Banyuasin District Empat Lawang District Lahat District Muara Enim District Musi Banyuasin District Musi Rawas District Ogan Ilir District Ogan Komering Ilir District Ogan Komering Ulu District South OKU District Oku Timur District
Bengkulu	North Bengkulu District Muko-Muko District
Lampung	South Lampung District Central Lampung District East Lampung District North Lampung District Tulangbawang District Way Kanan District
Bangka Belitung Island	Bangka District West Bangka District South Bangka District

	Central Bangka District Belitung District East Belitung District Bintan District Karimun District Lingga District Natuna District
West Java	Cirebon District Indramayu District Karawang District Kuningan District Majalengka District Purwakarta District Subang District Sumedang District
Sentral Java	Boyolali District Demak District Grobogan District Jepara District Karanganyar District Kendal District Klaten District Kudus District Magelang District Pati District Semarang Sragen District Sukoharjo District Wonogiri District
Special Region of Yogyakarta	Bantul District Gunung Kidul District Kulon Progo District Sleman District
East Java	Banyuwangi District Bondowoso District Madiun District Magetan District Nganjuk District

	Ngawi District Ponorogo District Situbondo District
Banten	Lebak District Pandeglang District Serang District Tangerang District Banten District
Bali	Badung District Bangli District Buleleng District Gianyar District Jembrana District Karang Asem District Klungkung District Tabanan District
West Nusa Tenggara	Bima District Dompu District West Lombok District Central Lombok District East Lombok District Sumbawa District West Sumbawa District
East Nusa Tenggara	Alor District Belu District Ende District East Flores District Kupang District Lembata District Manggarai District West Manggarai District Negekeo District Ngada District Rote Ndao District Sikka District West Sumba District Southwest Sumba District Central Sumba District

	East Sumba District South Central Timor District North Central Timor District
West Kalimantan	Bengkayang District Kapuas Hulu District North Kayong District Ketapang District Landak District Melawi District Pontianak District Sambas District Sanggau District Sekadau District Sintang District
Sentral Kalimantan	South Barito District East Barito District North Barito District Gunung Mas District Kapuas District Katingan District Lamandau District Murung Raya District Pulang Pisau District Seruyan District Sukamara District
South Kalimantan	Balangan District Barito Kuala District Hulu Sei Selatan District Hulu Sei Tengah District Hulu Sei Utara District Tabalong District Tapin District
East Kalimantan	West Kutai District Kutai Kartanegara District Malinau District Nunukan District Pasir District North Penajem Paser District

West Kalimantan	Bantaeng District Barru District Bone District Bulukumba District Enrekang District Gowa District Jeneponto District Luwu District North Luwu District Maros District Pangkajene Island District Pinrang District Selayar District Sidenreng Rappang District Sinjai District Soppeng District Takalar District Tana Toraja District Ajo District
Southeast Sulawesi	Bombana District Buton District North Buton District Kolaka District Konawe District South Konawe District North Konawe District Muna District
Gorontalo District	Boalemo District Bone Bolango District North Gorontalo District Pohuwato District
West Sulawesi	Majene District Mamasa District Mamuju District North Mamuju District Polewali Mandar
Mollucas	Western Southeast Mollucas District
Papua	Merauke

2.3.8 Erosion Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for erosion in Indonesia (Annex 2), the disaster management plan for erosion in the forthcoming five years will be focused on areas outlined in Table 2.14.

Table 2.14 Distribution of high risk zones for erosion

PROVINCE	DISTRICT/CITY
Nanggroe Aceh Darussalam	Sabang City
North Sumatra	Dairi District Humbang Hasundutan District Karo District Binjai City Medan City Pematang Siantar City Sibolga City South Nias District Padang Sidempuan District North Tapanuli District Toba Samosir District
West Sumatra	Sawahlunto City Tanah Datar District
Bengkulu	South Bengkulu District
Lampung	Metro City
West Java	Bandung District Bogor District Ciamis District Cianjur District Cirebon District, Garut District Indramayu District Banjar City Bekasi City Cimahi City Cirebon City Tasikmalaya City Sukabumi District Tasikmalaya District

Central Java	Banjarnegara District Banyumas District Batang District Cilacap District Karanganyar District Kebumen District Magelang City Surakarta City Tegal City Magelang District Pekalongan District Pemalang District Purbalingga District Purworejo District Semarang District Temanggung District Wonogiri District Wonosobo District
Special Region of Yogyakarta	Gunung Kidul District Kulon Progo District
East Java	Bangkalan District Bondowoso District Blitar City Pasuruan City Madiun City Mojokerto City Pacitan District Pamekasan District Ponorogo District Probolinggo District Sampang District Trenggalek District
Banten	Cilegon City Tangerang City Lebak District
Bali	Karang Asem District Klungkung District

West Nusa Tenggara	Bima District Dompu District Bima City Mataram City Central Lombok District West Sumbawa District
East Nusa Tenggara	Alor District Belu District Ende District East Flores District Kupang City Kupang District Manggarai District West Manggarai District Negekeo District Ngada District Rote Ndao District Sikka District West Sumba District Central Sumba District East Sumba District South Central Timor District North Central Timor District
West Kalimantan	Bengkayang District Sambas District Sanggau District Sekadau District Sintang District
South Kalimantan	Banjar District Hulu Sei Selatan District Hulu Sei Tengah District Tanah Laut District
East Kalimantan	Balikpapan City Bontang City Tarakan City East Kutai District
North Sulawesi	Tomohon City Kotamobagu District

	Minahasa District South Minahasa District Southeast Minahasa District
West Nusa Tenggara	Bantaeng District Enrekang District Gowa District
East Nusa Tenggara	Jeneponto District Makassar City Pare-pare City Luwu District Tana Toraja District
Southeast Sulawesi	Buton District Baubau City
Gorontalo District	Gorontalo District
West Sulawesi	Majene District Polewali Mandar District
Mollucas	Central Mollucas District Southeast Mollucas District
South Mollucas	East Halmahera District Tidore District

2.3.9 Building and House Fire Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for building and house fires in Indonesia (Annex 2), the disaster management plan for building and housing fires in the forthcoming five years will be focused on areas outlined in Table 2.15.

Table 2.15 Distribution of high risk zones for building and house fires

PROVINCI	DISTRICT/CITY
Nanggroe Aceh Darussalam	West Aceh District Aceh Besar District Aceh Singkil District Central Aceh District East Aceh District North Aceh District

	North Aceh District Lhokseumawe City Pidie District Simeulue District
North Sumatra	Agam District Asahan District Dairi District Deli Serdang District Medan City Sibolga City Tanjung Balai City Labuhan Batu District Mandailing Natal District Pakphak Barat District Central Tapanuli District North Tapanuli District Toba Samosir District
WestSumatra	Dharmasraya District Bukit Tinggi City Padang City Padang Panjang City Lima Puluh Koto District Padang Pariaman District Pasaman District West Pasaman District Pesisir Selatan District South Solok District
Riau	Pekanbaru District
Jambi	Danau Kerinci District Muaro Jambi District Sarolangun District West Tanjung Jabung District
South Sumatra	Banyuasin District Palembang City Lahat District Musi Rawas District Ogan Ilir District Ogan Komering Ilir Districtt

	East OKU District Pagaralam District Prabumulih District
Bengkulu	South Bengkulu District Bengkulu City Rejang Lebong District
Riau Island	Batam City
DKI Jakarta	West Jakarta Central Jakarta South Jakarta East Jakarta North Jakarta
West Java	Bandung District Bekasi District Bogor District Cianjur District Garut District Karawang District Bandung City Purwakarta District Sukabumi District Sumedang District Tasikmalaya District
Central Java	Banjarnegara District Banyumas District Blora District Boyolali District Brebes District Grobogan District Purwodadi District Jepara District Karanganyar District Kendal District Klaten District Semarang City Surakarta City Magelang District Pemalang District

	Purbalingga District Rembang District Semarang District Temanggung District Wonogiri District Wonosobo District
East Java	Surabaya City Mojokerto District
Banten	Serang District Tangerang District
Bali	Buleleng District Gianyar District Jembrana District Karangasem District
West Nusa Tenggara	Bima District Dompu District West Lombok District Central Lombok District East Lombok District Mataram District Sumbawa District
East Nusa Tenggara	Kupang City Kupang District Lembata District Ngada District North Central Timor District
West Kalimantan	Landak District Pontianak District
Central Kalimantan	Barito Utara District Katingan District West Kotawaringin District East Kotawaringin District Murung Raya District Palangkaraya District Pulang Pisau District
South Kalimantan	Banjar District Banjarmasin District Hulu Sei Utara District

	Kotabaru District Tanah Laut District
East Kalimantan	Balikpapan City Berau District Kutai District West Kutai District East Kutai District Samarinda City Tarakan City
North Sulawesi	North Minahasa District
Central Sulawesi	Palu City
South Sulawesi	Bone District Gowa District Makassar City Parepare City Luwu District East Luwu District Pinrang District Soppeng District Tana Toraja District Wajo District
Southeast Sulawesi	Buton District Kendari City
Papua	Jayapura District

2.3.10 Extreme Wave and Abrasion Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for extreme wave and abrasion in Indonesia (Annex 2), the disaster management plan for extreme wave and abrasion in the forthcoming five years will be focused on the following provinces:

1. Nanggroe Aceh Darussalam
2. North Sumatra
3. West Sumatra
4. DKI Jakarta
5. East Nusa Tenggara

6. West Nusa Tenggara
7. West Java
8. Banten
9. Special Region of Yogyakarta
10. Central Java
11. East Java
12. South Sulawesi

2.3.11 Extreme Weather Risk

Based on the distribution of high risk zones that is put in the spatial map of disaster risk index for extreme weather in Indonesia (Annex 2), the disaster management plan for extreme weather in the forthcoming five years will be focused on areas outlined in Table 2.16.

Table 2.16 Distribution of high risk zones for extreme weather

PROVINCI	DISTRICT/CITY
Nanggroe Aceh Darussalam	Aceh Besar District Bireun District Sabang City Simeuleu District
Riau	Indragiri Hilir District Pekanbaru District Pelalawan District Siak District
Jambi	Bungo District Jambi City West Tanjung Jabung District
South Sumatra	Banyuasin District Lubuk Linggau City
Bengkulu	North Bengkulu District
Lampung	Bandar Lampung City Metro City South Lampung District

DKI Jakarta	West Jakarta City Central Jakarta City South Jakarta City East Jakarta City North Jakarta City
West Java	Bandung District Bogor District Cianjur District Cirebon District
Sentral Java	Semarang District Cilacap District Tegal District Pekalongan District (all districts in the north coast) Bantul District
Special Region of Yogyakarta	Gunung Kidul District Kulon Progo District
East Java	Banyuwangi District Jember District Pasuruan District
Banten	Cilegon City Lebak District Pandeglang District Serang District Tangerang District

2.3.12 Technological Failure

Indonesia still needs to conduct further mapping of areas that have critical industries or installations that are prone to technological failure. Besides, related to land transport accidents, considering the high number of deaths caused by this type of accident, there needs to be a mapping of areas that are particularly prone to land transport accidents.

2.3.13 Epidemics and Diseases

Avian influenza has the potential of happening in the Provinces of North Sumatra, West Sumatra, Lampung, Banten, West Java, DKI Jakarta, Central Java, East Java,

Bali, West Nusa Tenggara, East Nusa Tenggara, West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, South Sulawesi, Southeast Sulawesi, Central Sulawesi, North Sulawesi, Gorontalo and West Papua. Malaria is also still big problem in Indonesia. There are 424 districts/cities (73.6%) that are malaria endemic, so that nearly half (45%) of Indonesia population face the risk of contracting Malaria. The list of priority diseases that may potentially develop into Extraordinary Events (KLB) includes:

1. Acute Diarrhea
2. Confirmed Malaria
3. Suspect Dengue Fever
4. Pneumonia
5. Bloody Diarrhea
6. Suspect Typhoid Fever
7. Acute Jaundice
8. Suspect DBD
9. Suspect Avian Influenza in people
10. Suspect Measles
11. Suspect Diphtheria
12. Suspect Pertusis
13. AFP (paralysis)
14. Rabies Carrier Bites
15. Suspect Anthrax
16. Unidentified Fever
17. Suspect Cholera
18. Unidentified Disease Cluster
19. Suspect Meningitis/Encephalitis
20. Suspect Tetanus Neonatus
21. Suspect Tetanus

2.3.14 Social Conflict

Indonesia currently still faces the potential of conflict. Local conflicts that occur in several places in the country contain latent potential for reemergence. Social structure that creates economic imbalance and injustice, when it reaches its climax, may trigger social conflict. Similarly, the wide gap between the rich and the poor, widespread unemployment and high poverty level may also have the potential of triggering conflict. In addition to internal social conflict among the community members, there are also regional and international conflict potentials, for instance in remote areas around the border between Indonesia and its neighboring countries like Malaysia.

If we use historical conflict indicators and the number of displaced people a province has, provinces that are prone to social conflict in Indonesia include mainly the following:

1. Nanggroe Aceh Darussalam
2. North Sumatra
3. West Kalimatan
4. Central Kalimantan
5. East Nusa Tenggara
6. Mollucas and North Mollucas
7. Central Sulawesi
8. Southeast Sulawesi
9. West Sulawesi
10. Papua
11. West Papua

CHAPTER III
PROBLEMS, CHALLENGES AND OPPORTUNITIES

3.1 ISSUES AND PROBLEMS

One of the current issues in disaster management is that performance in disaster management is still not optimal. In general it could be said that the government, the community and all relevant disaster management stakeholders in Indonesia have not been prepared to deal with disasters so that the number of disaster victims every year is still high and the material losses caused by disaster are also still sizeable. Unoptimal performance can also be seen in poor coordination and cooperation in emergency response. During emergency response ineffectiveness can still be seen in the mobilization of the search and rescue teams and in the collection and distribution of aid goods for disaster survivors.

Post-disaster recovery has also not been optimal. Data concerning the number of people died and injured, and data about houses totally destroyed, heavily damaged and lightly damaged are seldom consistent and sometimes there are several versions of data that do not agree with each other. Difference of data in terms of survivors that are injured and the types of injury they suffer will make it difficult to allocate medical personnel and equipments, including medicine needed to treat disaster survivors. Likewise, difference in data concerning damaged houses, and public facilities and infrastructures will hamper the calculation of the needs for rehabilitation and reconstruction, which will further slow down the overall recovery of the disaster-affected communities.

The other issue that also needs to be dealt with immediately is the institutional orientation of disaster management in Indonesia that still tends to emphasize more emergency response rather than disaster prevention and risk reduction. It seems that the understanding and realization that disaster risks may be reduced through development interventions are still very limited. Law Number 24 year 2007 on Disaster Management has shifted disaster management paradigm from a responsive orientation (focused on emergency response and recovery) to a preventive one (risk reduction and preparedness), but in implementation there are still few disaster risk reduction programs that are planned and programmed. Disaster risks can be reduced through development programs that employ a risk reduction perspective and spatial planning that is based on disaster risk mapping and analysis.

In nearly all disaster events, the role of the government and other external parties is still too dominant. The role of local disaster preparedness teams has not been

significant in recent disasters. News coverage in the media is dominated by the actions of rapid response teams from many government and non-government organizations, including the most prominent usually from the military. Considering that Indonesia consists of thousands of islands that are not always easy to access, it is important to develop disaster rapid response teams at the community level, since it is the community that firstly comes face to face with the adverse impacts of disaster. The number of victims and the scale of losses caused by disaster can be reduced significantly with the presence of a local government and community that are resilient and prepared to face disaster. This resilience and preparedness may be reached through regular disaster training and simulations at the grassroots level.

Another issue is the less than optimal utilization of science and technology in reducing disaster risks, including the utilization of technology-based early warning systems. Many areas that face earthquake, tsunami and volcanic eruption hazards that may turn disastrous, have yet to possess detailed data and information related to the hazards they face and their intensity that are assessed using the recent science and technology. Such kind of information is very much needed in highly hazard prone areas to develop science-based risk reduction measures. There is a need to involve universities in developing disaster research, science and technology.

Another concern is that disaster management in Indonesia has yet to become comprehensive. It is yet to be made clearer who will be doing what in time of disaster. Many parties want to help but do not know what to do. In several instances, several government agencies perform similar tasks, and thus making it overlapping and redundant and making the local governments confused. There is a need to formulate standard operating procedures in disaster management.

Another thing that is not unimportant is the issue of gender and marginalized group, including the poor, whose plight is often neglected in time of disaster. Women in Indonesia are left behind by their opposite sex counterparts in the field of education, economy, politics and health. Such gender imbalance may affect women's fate in an emergency situation. This inferior position situation will be worsened by women's special needs in emergency, because women usually do not think about themselves first but prioritize their children and families.

Special attention needs to be given to poor and minority or marginalized groups, since they are usually also the most vulnerable groups. Disaster related programs need to be designed in such a way in order that they will not increase the vulnerability of these groups. In an emergency situation with its complex needs, it is often too easy to forget the plight of the poor and the marginalized.

3.2 CHALLENGES AND OPPORTUNITIES

The shift of paradigm in disaster management from emergency response to risk reduction as stipulated by Law Number 24 year 2007 on Disaster Management has yet to be realized. The National Agency for Disaster Management, the agency mandated by the law to formulate policies in disaster management and displaced persons management is still very young. Even younger are the local disaster management agencies at the provincial and district/city levels.

The challenge now is to socialize the new paradigm and turn it into disaster policies, regulations and operating procedures to the lowest level of governance. Disaster risk reduction paradigm needs to always be advocated among decision makers, so that all development policies and programs in Indonesia will be risk sensitive. Similarly, coordination and cooperation among disaster stakeholders need to be enhanced. With the mainstreaming of disaster risk reduction into development programs, it is expected that disaster management mechanism that is integrated, effective, efficient and reliable can be realized.

The other challenge faced by the country is the huge needs for capacity building in disaster management. With the sizeable population of the country and the presence of many people in hazard prone areas, many communities need to be regularly engaged in disaster training and simulations. Many emergency rapid response teams need to be established at the community level and equipped with sufficient resources. At the government level, many districts and cities are yet to establish their local disaster management bodies. Once the bodies have been established, they need to be outfitted with the required resources and their personnel need to be trained. Relevant government offices need to be made aware of the importance of risk-sensitive development planning and programming, as well as implementing disaster emergency and recovery that are well managed.

The handling of disaster event may become a benchmark for the success of disaster management in the country. Similar to the educational process in school, disaster risk reduction initiatives in a normal situation is like the learning process, while the handling of a disaster situation is the examination. Disaster needs to be handled not only in the emergency stage but also during the rehabilitation and reconstruction stages. The challenge during the emergency response is the sluggishness of the action taken and the difficulty in coordination among responders. Meanwhile, the challenge in rehabilitation and reconstruction is that it seldom involves local wisdom and building back better principles.

Amidst the huge need for capacity building, the budget and resources available for disaster risk reduction are still very limited. The biggest portion of the budget is still

allocated to programs related to emergency response and disaster recovery. Considering these challenges, in the early stages of disaster management planning in Indonesia, the country needs to carefully prioritize its disaster risk reduction programs and activities.

Although the challenges are enormous, there are many opportunities that may be taken advantage of by Indonesia to press on with disaster risk reduction agenda. The growingly supportive policy environment can be cited as the first opportunity. With the enactment of Law Number 24 Year 2007 on Disaster Management, which is followed by its ancillary government regulations, presidential regulations, ministerial regulations and decrees of the Head of the National Agency for Disaster Management, disaster management regulatory framework has been perfected continuously.

Related to the supportive disaster management regulatory framework, the institutional aspect of disaster management has also been built through the establishment of the National Agency for Disaster Management and Local Disaster Management Agencies at the provincial and district/city levels. This constitutes the second opportunity for advancing disaster risk reduction paradigm. The set-up of independent DM agencies at all government levels will ensure better management of disaster and related issues. Besides, with the presence of national and local DM agencies, the conduct of disaster management will be more directed, integrated, comprehensive and effective as well as efficient.

The next opportunity is the growing attention the world puts on the issue of disaster risk reduction, particularly in relation to the emergent global climate change. At the country level, increased attention to disaster risk reduction has been shown through the establishment of the National Platform for DRR (Planas PRB) and similar other forums in the region. The presence of such platforms and forums encourages the multi-stakeholders, including the private sector and university, to actively participate in disaster management efforts. This will certainly enhance the conduct of disaster management in Indonesia.

The commitment of disaster management actors in implementing disaster risk reduction and in taking part in emergency response and recovery constitutes another opportunity. Cross-sectoral collaboration that involves the government, the people and the private sector in the form of enhancing poverty reduction, facilitating basic education and improving community's health can also contribute to disaster risk reduction. Similarly, the commitment of our neighboring countries in the ASEAN region is also commendable as can be seen with the establishment of the AHA Center and the conduct of joint disaster exercise through the ASEAN Regional

Disaster Exercise (ARDEX) as the implementation of AADMER (ASEAN Agreement on Disaster Management and Emergency Response).

CHAPTER IV
DISASTER MANAGEMENT POLICY

4.1 VISION AND MISSION

The Vision of Disaster Management in Indonesia is:

“A nation that is resilient in facing disaster”

The Missions of Disaster Management in Indonesia are as the following:

1. To protect the nation from disaster through risk reduction measures;
2. To build a reliable disaster management system;
3. To conduct disaster management in a planned, integrated, coordinated and comprehensive manner.

4.2 INSTITUTIONAL ARRANGEMENT

Based on Law Number 24 Year 2007 on Disaster Management, the key agency tasked with disaster management at the national level is the National Agency for Disaster Management (*Badan Nasional Penanggulangan Bencana*/BNPB). BNPB is a non-ministerial government agency that is headed by a minister-level official. The agency is responsible for formulating policies in disaster management and displaced person’s management through rapid, accurate, effective and efficient actions. It is also responsible for the coordination of disaster management among government offices and the multi-stakeholders.

In implementing disaster management BNPB does not work alone but in cooperation with the other Ministries, Agencies and other institutions. For search and rescue of disaster victims, BNPB works closely with the national armed forces, the national police, Basarnas (the national SAR) and PMI (Indonesian Red Cross). BNPB works with the Ministry of Social Affairs in dealing with displaced people. For mapping of hazard prone areas, the agency works with Bakosurtanal (national mapping agency) and Ministries/Agencies tasked to deal with specific hazards. In developing disaster early warning system, BNPB works with the Ministry of Energy and Mineral Resources and BMKG for geological hazards, with the Ministry of Public Works, Ministry of Agriculture, Ministry of Forestry, LAPAN, and BMKG for hydro-meteorological hazards, and supported by research done by the Ministry of Research and Technology, BPPT, LIPI and universities.

For disasters related to the environment, BNPB works with the Ministry of the Environment, Ministry of Marine Affairs and Fishery and BMKG. Related to biological aspects such as pandemics and extraordinary events, BNPB works with the Ministry of Health and the Ministry of Agriculture. BNPB works with the Ministry of National Education, the Ministry of Religious Affairs and the media for disaster education. For research in the field of disaster, besides working with technical ministries, BNPB is particularly supported by the Ministry of Research and Technology, BPPT, LIPI and universities throughout Indonesia.

In the regions the agency tasked with the conduct of disaster management is the local DM agency (*Badan Penanggulangan Bencana Daerah*/BPBD). BPBD is established both at the provincial and district/city levels. As BNPB at the central level, at the local level BPBD is responsible for the formulation of policies related to disaster and displaced people. The body is also tasked with the coordination of disaster management related activities. The creation of BPBD is based on the Decree of BNPB Head Number 3 year 2008 on the Guidelines for the Establishment of Local Disaster Management Agency (Perka BNPB No. 3/2008) and Minister of Home Affairs' Regulation Number 46 year 2008 on the Guidelines for the Organization and Management of the Local Disaster Management Agencies (Permendagri No. 46/2008).

As stipulated in Article 2 Permendagri No. 46/2008, BPBD is established in all provinces and may be established in the districts/cities. BPBD at the provincial and district/city levels is legalized through Local Regulations or Decrees of the head of the region. Disaster management functions for regions that do not have BPBD will be carried out by local units that used to deal with these functions. Up to the end of October 2009, from the existing 33 provinces, 16 provinces have established their BPBD. Meanwhile, for the district and city level, of nearly 500 existing districts/cities in Indonesia there are only 21 districts/cities that have already had BPBDs.

Besides the government national DM agency, at the national level a national DRR forum was established, the National Platform for Disaster Risk Reduction (Planas PRB), an independent forum for advocating and facilitating multi-stakeholder cooperation in disaster risk reduction in Indonesia. Planas PRB was declared in Jakarta on 20 November 2008. The forum attempted to accommodate disaster-related interests and help synchronize DRR policies, programs and activities at the national level, as part of the effort to achieve Indonesian DM objectives and help materialize a resilient nation and people, in line with the Hyogo Framework for Action.

Along with Planas PRB at the central level, there are several local or sectoral DRR platforms or forums that are established by the multi-stakeholders to advocate for

specific issues. At the national level there is the University Forum for DRR, Consortium for Disaster Education, Coastal and Small Island Disaster Mitigation Forum, and so forth. At the local level there is the Merapi Forum, a forum established to facilitate cooperation in the management of Merapi Volcano, both through the aspect of the hazard, environment and the social-cultural aspects of the people. The Forum involves, among others, local governments and local Red Cross in Klaten District, Boyolali District, Magelang District and Sleman District, Pasag Merapi Community Group, Agency for Research and Development of Volcanic Technology (*Balai Penelitian and Pengembangan Teknik Kegunungapian*/BPPTK), a university from Yogyakarta and several donor agencies. It is expected that the presence of such DRR forums could improve the quality of disaster management in Indonesia.

In general, the roles and functions of Government Ministries and Agencies at the central level are as the following:

1. Coordinating Ministry for People's Welfare coordinates disaster management programs and activities cross government ministries and agencies.
2. Ministry of Home Affairs controls development activities related to disaster management conducted by local governments.
3. Ministry of Foreign Affairs supports disaster management programs and activities that involve international partners.
4. Ministry of Defense maintains security in disaster affected areas, both during the emergency response and during post-disaster recovery.
5. Ministry of Law and Human Rights encourages and supervises the improvement and synchronization of laws and regulations related to disaster management.
6. Ministry of Finance is responsible for the preparation of budget for the conduct of disaster management before, during and after disaster.
7. Ministry of Energy and Mineral Resources plans and controls mitigation efforts in geological hazards and man-mad hazards that are related to geological hazards.
8. Ministry of Agriculture plans and controls mitigation efforts related to drought and other hazards related to agriculture.
9. Ministry of Forestry plans and controls mitigation efforts in the field of forest and land fires.

10. Ministry of Transportation plans and implements transportation supports in the event of disaster.
11. Ministry of Marine Affairs and Fishery plans and controls mitigation efforts in tsunami and coastal abrasion.
12. Ministry of Public Works plans risk sensitive spatial planning, and location and evacuation routes and the needs for recovery of public facilities and infrastructures.
13. Ministry of Health plans health and medical services in the event of disaster, including medicines and medic/paramedic staff.
14. Ministry of National Education plans and controls emergency education for disaster affected areas and recovery of education facilities and infrastructures, and coordinates disaster awareness education.
15. Ministry of Social Affairs plans food, clothing and other basic needs for people displaced by disaster.
16. Ministry of Communication and Informatics plans and controls the provision of facilities and infrastructures for emergency communication to support disaster emergency response and post-disaster recovery.
17. Ministry of Manpower and Transmigration plans mobilization and migration of disaster survivors to safe areas.
18. Ministry of Research and Technology conducts study and research as inputs for disaster management planning before and during disaster and for rehabilitation and reconstruction stage.
19. Ministry of Cooperatives and Micro Businesses implements micro businesses and other productive economic activities for the poor people in disaster affected areas to accelerate recovery.
20. Ministry of Environment plans and controls preventive efforts, advocacy and early warning in preventing environment-related disasters.
21. Ministry of Development of Disadvantaged Areas plans and controls development programs in disadvantaged areas based on disaster risk analysis.
22. Ministry of National Development Planning supports the planning of risk-sensitive development programs.
23. Ministry of People's Housing coordinates the provision of settlements for disaster survivors.

24. The Indonesian National Armed Forces (TNI) supports the conduct of search and rescue and supports the coordination of disaster emergency response.
25. The National Police of the Republic of Indonesia (Polri) supports search and rescue and provides security during emergency situation, including guards locations left behind by evacuated citizens.
26. Basarnas (the National SAR Agency) supports BNPB in coordinating and implementing Search and Rescue (SAR) activities.
27. Bakosurtanal (national mapping agency) plans and controls disaster risk mapping in coordination with technical ministries/agencies.
28. BMKG (national meteorological agency) coordinates the monitoring of hazards related to meteorology, climate and geophysics.
29. BPPT (Agency for the Development and Implementation of Technology) supports in the assessment and implementation of technology that is related to disaster management.
30. BPS (Statistics Indonesia) supports in the provision of statistical data.
31. BPN (National Land Agency) supports in the provision of data related to land ownership.
32. LIPI (Indonesian Science Institute) supports in the study of sciences that are related to disaster management.
33. LAPAN (National Aviation and Aeronautics Agency) supports in the provision of spatial information and data from satellite.
34. BSN (National Standardization Agency) supports in the standardization of guidelines and procedures related to disaster management.
35. Bapeten (Nuclear Energy Regulatory Agency) supports in the monitoring, utilization and control of nuclear-related activities.
36. BATAN (National Nuclear Agency) supports in the monitoring, utilization and control of nuclear-related activities.

4.3 POLICY AND STRATEGY

Disaster management policy in Indonesia is regulated mainly through Law Number 24 year 2007 on Disaster Management, Government Regulation Number 21 year 2008 on the Conduct of Disaster Management and the other government regulations and presidential regulations ancillary to Law Number 24 Year 2007.

The conduct of disaster management in Indonesia, as stipulated by Article 2 Law Number 24 year 2007 on Disaster Management, is based on the ideology of the Pancasila and the Constitution of the Republic of Indonesia year 1945. In the next section, Article 3, it is maintained that the key principles in disaster management include the principle of humanity; justice; equality before the law and government; balance, harmony, and match; order and legal certainty; togetherness; environmental sustainability; and science and technology, meanwhile the disaster management principles include the principle of rapid and accurate; priority activities; coordination and integration; efficiency and effectiveness; transparency and accountability; partnership; empowerment; non-discriminatory; and not for religious purposes.

Article 5 Law Number 24 Year 2007 on Disaster Management stipulates that the Government and local governments are responsible for the conduct of disaster management. This responsibility, in line with the stipulation of Article 6, includes disaster risk reduction and mainstreaming of disaster risk reduction into development programs; protection of community from the adverse impacts of disaster; fulfillment of the rights of the community and people displaced by disaster in a fair manner and complying to the minimum service standards; recovery from disaster impacts; allocation of budget for disaster management in the State Revenue and Expenditure Budget; allocation of on-call disaster management budget; and maintenance of authentic and credible archives/documents from the threats and impacts of disaster.

In a normal situation or at times where there is no disaster, disaster risk reduction programs and activities at the central level will be implemented by the relevant Ministries/Agencies in line with their respective tasks and responsibilities. Structural mitigation activities such as the building of flood embankment and evacuation routes, for instance, become the responsibility of the Ministry of Public Works. Preparation of logistics to meet the needs of potential displaced population during an emergency situation becomes the responsibility of the Ministry of Social Affairs.

In a normal situation, BNPB and BPBD at the local level performs the function of coordination and implements activities related to prevention, mitigation and preparedness. Several disaster risk reduction actions will require the collaboration of cross-agencies such as in the provision of volcanic eruption early warning system

that will involve the Ministry of Energy and Mineral Resources through the Geology Agency and local governments through BPBD. The socialization of the early warning system and the mock drills to use it will involve the education office, universities and NGOs, with BNPB/BPBD as coordinator.

In an emergency situation BNPB and BPBD performs the function of command, coordination as well as implementing emergency response activities. In this situation BNPB and BPBD could coordinate sectoral agencies in emergency response operations. In a post disaster situation BNPB and BPBD will again perform their coordination function and implement recovery activities, while the functions that belong specifically to sectoral agencies will be performed by each sectoral agency. The conduct of disaster management at the central and local levels will require coordination with all sectors and elements of the society. The distribution of roles among disaster risk reduction stakeholders will also be arranged through the National DM Plan.

The strategies employed to realize the Indonesian disaster management vision and mission will be as the following:

1. **Enhancement of disaster management regulatory framework**

   The enhancement of disaster management regulatory framework will be done through the formulation of regulations, standard operating procedures and disaster management plans for the central to local levels. Through these measures it is expected that the conduct of disaster management will be more clearly directed, effective and efficient. Special efforts will be done to establish and increase the capacity of disaster management agencies and other relevant institutions at the central and local levels to face pre-disaster situation, emergency response and post-disaster recovery. Coordination and cooperation will be enhanced between government agencies and apparatuses as well as all the stakeholders in realizing dependable disaster management.

2. **Integration of risk reduction programs into development programs**

   Disaster risk reduction programs will need to be integrated into development plans at the central and local levels, into the Middle-term Development Plan (RPJM), Annual Development Plan (RKP), Strategic Plans and Work Plans of Ministries/Agencies, Local Middle-term Development Plan (RPJMD), Local Annual Development Plan (RKPD) and Work Plan of Local Government Units. In this way, risk reduction programs and activities will not stand by themselves but will be mainstreamed into regular development programs. It is expected that this strategy will help realize risk sensitive development and resilient community.

3. Capacity building for universities

The strategy aims at empowering universities to make them able to facilitate capacity building for disaster management and develop disaster science and technology at the national as well as local levels. In the current era of decentralization, it would not be possible for the central government, in this case BNPB, to implement all disaster management capacity building programs and activities for the regions. Hence, BNPB will build partnership with universities at the central and local levels to increase capacity for disaster management. It is expected that universities will be involved in developing disaster management science and technology that are appropriate to the local context.

4. Community-based disaster management

In addition to collaborating with local universities, the other strategy employed will capacity building of communities living in highly hazard prone areas. Considering that Indonesia is so vast and possesses sizable inhabitants that live in thousands of islands, it would be more effective if disaster management capacity is build at the community level. The community is the first party that faces disaster risk. Since the capacity of the government for emergency response is still very limited, it is more economical and effective to build community's capacity for disaster response. For this purpose, volunteerism will be encouraged at all levels of the society.

5. Establishment of the Indonesian National Rapid Response and Action Team (SRC-PB)

To face large-scale disaster Indonesia develops Rapid Response Teams (*stand-by force*) for disaster management, particularly for emergency response purposes. These units will be manned by selected specialists from all branches of sciences and expertise. At the national level there are two chief SRC-PB teams; one has its headquarters at Halim Perdana Kusuma Airbase in Jakarta, and the other one at Abdul Rahman Saleh Airbase in Malang. The unit headquartered in Jakarta will serve western Indonesia areas, while the unit in Malang will serve eastern Indonesian areas. The presence of these elite disaster management units will boost the capacity of Indonesia's response capacity significantly.

6. Specific risk reduction programs for groups with special needs

A special approach will be employed to encourage gender mainstreaming into disaster management and risk reduction programs, through specific programs

for women and children. Besides, special attention will also be given to the poor, minority and marginalized groups, as well as the diffables and those with special needs, in order that disaster risk reduction programs will not increase their vulnerability, but on the contrary increase their resilience to disaster.

7. Enhancement of the role of NGOs and government partner organizations

In many disaster events local, national or international NGOs have gained more and more roles, especially during the emergency response and in the post-disaster recovery. This role will be enhanced even more to help promote disaster risk reduction and preparedness at the community level. The government will collaborate more closely with non-government organizations and other partner organizations in increasing the resilience of the community in facing disaster. Related to that, the government will also cooperate more with NGOs and community organizations in mobilizing volunteers and promoting volunteerism in disaster management.

8. Enhancement of the role of the private sector

It is expected that the private sector could contribute more in mobilizing volunteers and promoting volunteerism in disaster management, including through the conduct of disaster training programs and capacity building for volunteers. The private sector could also contribute to disaster risk reduction initiatives through active participation in disaster risk reduction forums such as through the National Platform for DRR (Planas PRB) or similar other forums at the regional and local levels. Related to risk reduction efforts, agencies from the private sector, particularly those working in the field of finance, could contribute by developing risk transfer mechanism like disaster insurance and similar other instruments.

CHAPTER V

PROGRAM

The National DM Plan contains programs and priority focus as the foundation for the formulation of disaster management activities. The programs constitute the materialization of Indonesian disaster management vision and mission and based on the principle of risk management. The Indonesian disaster management Vision (Chapter VI) explicitly maintains the ideals of making Indonesia a resilient nation in facing disaster. The vision is supported by three missions, i.e. to build a disaster management system to protect the nation from disaster through risk reduction by implementing a planned, integrated, coordinated and comprehensive disaster management.

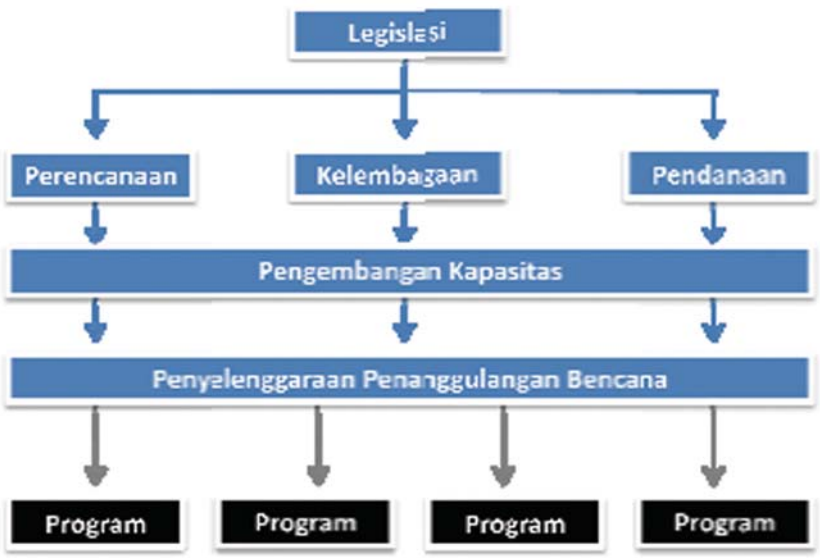


Figure 5.1 Indonesian Disaster Management System

The Indonesian disaster management system has five main pillars or sub-systems, i.e. legislation, planning, institution, budget and capacity. The system has been built to respond to the current problems and challenges (Chapter III) and translated into programs as the following: 1) improvement of regulations and institutional capacity; 2) integrated disaster management planning; 3) research, education and training; and 4) capacity building and community and stakeholders' participation in disaster risk reduction.

The shift of paradigm to disaster risk reduction has changed the pattern through responsive to preventive with a risk management approach. Whenever a certain area is considered as high risk, risk reduction measures will be applied. First of all, the hazard potential needs to be separated from the element at risk. This action is called as risk avoidance. If the hazard potential cannot be moved away from the element at risk, the next action would be risk reduction or mitigation. Mitigation can be structural or non-structural in nature. If risk reduction has been applied and there is still remaining risk, we need to do risk transfer to other parties, for instance through disaster insurance. When all the three measures have been exhausted and still there are risks left, the last option would be to accept the risk and implement preparedness measures. These actions in risk management are detailed in the programs: 5) disaster prevention and mitigation; 6) early warning system; and 7) preparedness.

The seven programs above are programs implemented prior to disaster. Pre-disaster activities are often called disaster risk reduction, so that the preparation of the action plan for disaster risk reduction only uses the seven programs. In addition to disaster risk reduction programs there are also programs during emergency response and after disaster. During an emergency situation we implement 8) emergency response programs and after disaster we implement 9) rehabilitation and reconstruction programs. Thus, the National DM Plan has nine programs.

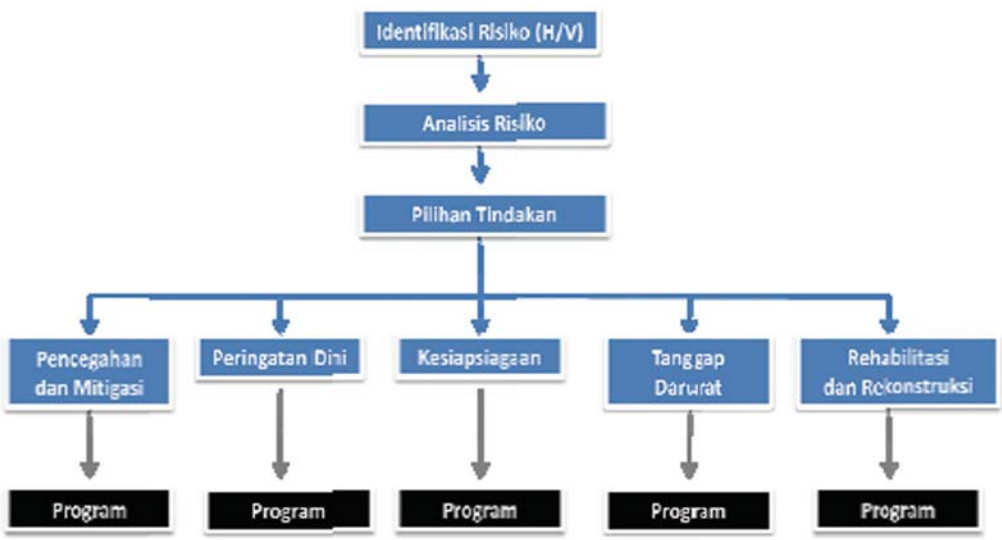


Figure 5.2 Selected action in disaster risk management

The programs in the National DM Plan are then detailed into priority focuses. The priority focuses serve as the direction in the formulation of activities by disaster management multi-stakeholders. It is expected that this arrangement will prevent overlapping of activities and avoid required activities that are left behind by all agencies.

The National DM Plan contains programs and priority focuses in the forthcoming five years. It has nine programs and forty seven priority focuses. Each program consists of priority focuses that will further detailed into activities implemented by government ministries/agencies, the community and the private sector through the action plan for disaster risk reduction.

The programs and priority focuses in the National DM Plan are as the following:

Table 5.1 Programs and priority focuses in the National DM Plan

NO.	PROGRAM	PRIORITY FOCUS
1.	Enhancement of regulatory framework and institutional capacity	1.1 Formulation of DM regulations, local regulations and DM SOPs that specify DM mechanism, including distribution of tasks, authority and resources, and coordination
		1.2 Establishment and strengthening of Local DM Bodies and their range of facilities (Emergency Operations Center, Local Rapid Response Teams, etc.)
		1.3 Management capacity strengthening for disaster management in the regions
		1.4 Enhancement of human resource capacity in disaster management (technical) and provision of sufficient volunteers
		1.5 Empowerment of universities to facilitate capacity building for disaster management

		1.6 Establishment of regional logistics warehouses, training centers and emergency operations centers as part of the effort to optimize disaster management resources
		1.7 Standardization of disaster management guidelines and references
		1.8 Coordination of planning and decision making as well as synchronization of policy implementation at the ministries/ agencies level
		1.9 Coordination of budgeting
2.	Integrated disaster management planning	2.1 Formulation of Disaster Management Plans at the central and local levels
		2.2 Mainstreaming of disaster management into development programs
3.	Research, education and training	3.1 Research and development of disaster management science and technology
		3.2 Improvement of utilization and implementation of science and technology for disaster management including early warning system
		3.3 Integration of disaster management science into school curriculums
		3.4 Implementation of disaster preparedness programs at schools
		3.5 Enhancement of capacity of the human resources for disaster education
		3.6 Information sharing and cross learning among regions and with other countries
		3.7 Public education through information dissemination related to disaster

4.	Capacity building and improvement of people's and stakeholders' participation in DRR	4.1 Strengthening of the role of media in nurturing preparedness culture and encouraging community's participation Development of disaster risk reduction forums in the regions
		4.2 Development of disaster risk reduction forums in the regions
		4.3 Enhancement of volunteers and stakeholders' participation in DRR
		4.4 Development of community based DRR programs
		4.5 Income diversification for communities and social safety nets for people in hazard prone areas
		4.6 Development of disaster risk financing mechanism (disaster insurance)
		4.7 Specific risk reduction and preparedness programs for women, children and marginalized groups
5.	Disaster prevention and mitigation	5.1 Disaster risk mapping
		5.2 Formulation of policies to control the ownership and exploitation of natural resources that have the potential to trigger disaster
		5.3 Formulation of policies on environmental management that are risk sensitive
		5.4 Monitoring and evaluation of regulations related to environmental/natural resource management that are risk sensitive
		5.5 Risk sensitive spatial planning and land use
		5.6 Implementation of structural and non-structural mitigation efforts
		5.7 Research and development

6.	Early warning system	6.1 Development of early warning systems
7.	Preparedness	7.1 Strengthening of the national rapid response teams (SRC PB) for the western and eastern regions
		7.2 International cooperation in improving preparedness and emergency response
		7.3 Development of rapid response teams at the regional office level
		7.4 Provision and preparation of logistics to meet basic needs in emergency
		7.5 Provision of basic needs for health in emergency
		7.6 Provision of materials for emergency and temporary settlements
		7.7 Improvement of accessibility of airports and seaports in hazard prone areas to meet emergency requirements
		7.8 Improvement of accessibility of communication and provision of real-time data and information for emergency response, development of disaster IT
		7.9 Formulation of contingency plans
		7.10 Enhancement of extension, training and simulations for emergency response
8.	Emergency response	8.1 Disaster rapid assessment
		8.2 Search, rescue and evacuation
		8.3 Fulfillment of basic needs for food, clothing, temporary settlements, health service, clean water and sanitation
		8.4 Emergency recovery of vital facilities-infrastructures and utilities

		8.5 Enhancement of emergency response capacity through education-training, development of systems and infrastructures and allocation of sufficient budget
9.	Rehabilitation and reconstruction	9.1 Rehabilitation and reconstruction of public facilities and infrastructures in disaster affected areas that have not been completed
		9.2 Identification and verification of damages and losses
		9.3 Formulation of rehabilitation and reconstruction plans
		9.4 Recovery of public facilities and infrastructures and reconstruction of housing for disaster survivors
		9.5 Recovery of people's health and psychological condition
		9.6 Enhancement of capacity for rehabilitation and reconstruction through education-training, development of systems and infrastructures and allocation of sufficient budget

In Table 5.1 it can be seen that generic programs that are applicable to all types of hazard include program number 1 up to number 4. Meanwhile, programs number 5 up to number 9 are programs that are specific to each hazard. In program no. 5 (prevention and mitigation) there are generic programs that are indicated in priority focus number 5.2 up to 5.5.

The priority focus to establish the national rapid response teams (SRC-PB) constitutes the implementation of the first 100 days of the Indonesian United Cabinet II in disaster management. In the forthcoming five years BNPB plans to have vertical units in the regions by the establishment of Regional Logistics Warehouse/Depots, Training Center and Emergency Operations Center in twelve locations. The decentralization aims at providing logistical support for hazard prone areas, and

contextualization of disaster management training with a local knowledge approach and as part of the effort to mobilize 10,000 disaster management volunteers.

In general, each priority focus has targets (Annex 3-17) that will be reached in the forthcoming five years. The targets usually have indicated locations to be prioritized because they are highly prone to certain hazards. The locations are identified through disaster risk analysis that takes into account the hazard, vulnerability and capacity aspects (Chapter II).

To achieve the targets all ministries/agencies as the key and relevant institutions need to be engaged. The key institution is responsible for coordinating the other relevant institutions; meanwhile the relevant institutions will play supporting role in assisting the key agency to achieve the targets. The key institution for any generic program that is applicable for all hazards is one agency. In this case, BNPB will mostly serve as the key institution as the realization of Article 13 letter b Law Number 24 Year 2007 that BNPB plays a coordinating role in the conduct of disaster management. For specific programs, the key institution may be more than one. For instance in reaching the target of making flood risk maps with a scale of 1:50.000 (Annex 8), the key institutions will be Ministry of Public Works, the Meteorology, Climatology and Geophysics Agency (BMKG) and the Coordinating Agency for National Survey and Mapping (Bakosurtanal). The three agencies have started by making an MOU or agreement to make the flood risk maps.

The most important thing in the implementation of the National DM Plan programs is the agreement and involvement of all government agencies, so that in the preparation of the National DM Plan all agencies have a significant role. The notion that disaster management is everybody's business is applied in the formulation of the National DM Plan, so that the plan constitutes the manifestation of common agreement in attaining our common disaster management targets in the forthcoming five years.

CHAPTER VI

BUDGET AND FINANCING

6.1 BUDGET

The budget needed to conduct disaster management in the forthcoming five years agreed in the National DM Plan is Rp**. 64,475,060,000,000** (sixty four trillion four hundred seventy five billion sixty million Rupiah), or an annual average of **Rp. 12,895,012,000,000** (twelve trillion eight hundred ninety five billion twelve million Rupiah).

Table 6.1 Indicative budget for each program in the National DM Plan

No.	PROGRAM	INDICATIVE BUDGET (Billion Rp.)
1.	Enhancement of regulatory framework and institutional capacity	30,638.00
2.	Integrated disaster management planning	24.16
3.	Research, education and training	368.50
4.	Capacity building and improvement of people's and stakeholders' participation in DRR	2,855.60
5.	Disaster prevention and mitigation	6,665.50
6.	Early warning system	822.00
7.	Preparedness	7,415.80
8.	Emergency response	1,008.50
9.	Rehabilitation and reconstruction	14,677.00
	TOTAL	**64,475.06**

The enhancement of regulatory framework and institutional capacity program needs a budget of Rp 30,638,000,000,000 that will be used among others to increase the capacity of the human resources in disaster management through training for all Provincial BPBD staff, to establish regional offices, to support the set up of 33

Centers for the Study of Disaster Management in various universities, strengthening of BPBD offices in 33 Provinces and 275 districts/cities.

The integrated disaster management planning program needs Rp 24,160,000,000 to formulate the National DM Plan and local DM Plans and for mainstreaming the disaster management plans for development programs in 33 provinces and 275 districts/cities.

The research, education and training program needs Rp 368,500,000,000 to fund 3.000 research in 33 universities in Indonesia, improvement of the application of technology in the management of 14 major hazards (including the development of early warning system), public education to increase the people's understanding of disaster in 33 provinces and 275 districts/cities, training for 4,000 teachers, development of disaster prepared schools in 275 districts/cities and 5 annual community-based DRR workshops.

The disaster prevention and mitigation program needs Rp. 6,665,500,000,000 to prepare guidelines for risk sensitive spatial planning and land use, formulate government and local regulations on environmental management in hazard prone areas in 33 provinces, and formulate policies related to risk sensitive environmental management.

The program for capacity building and improvement of people's and stakeholders' participation in DRR needs Rp 2,855,600,000,000 to establish 1,100 disaster resilient villages in 33 provinces, micro businesses for vulnerable communities in 12 most hazard prone provinces, 12 disaster management volunteer forums in 12 most hazard prone provinces, to enhance the role of media in nurturing preparedness culture and promoting community's participation by training 2,000 journalists at the national level and in 33 provinces, and to develop disaster insurance in all provinces.

The early warning system program needs Rp 822,000,000,000 to set up early warning systems in hazard prone provinces including their socialization.

The preparedness program needs Rp 7,415,800,000,000 for the establishment of two national rapid response teams in Malang and Jakarta and another 12 teams in 12 regional offices, for the provision of materials for temporary settlements, for improvement of accessibility of airports and seaports in hazard prone areas to meet emergency requirements, for the provision of logistics for basic needs in emergency, and for improvement of communication access in the national offices and in 33 provinces.

The emergency response program needs Rp 1,008,500,000 to mobilize resources, preparation of weather modification, collection and evacuation of victims in time of emergency.

The biggest budget allocation would be for rehabilitation and reconstruction program that needs Rp 14,677,000,000 for damage and loss assessment, preparation of rehabilitation and reconstruction plans, recovery of public facilities and infrastructures, and the recovery of psychological condition of disaster survivors. The biggest portion will be needed by earthquake hazard, as it often has a very big impacts on public facilities and infrastructures that need to be rebuilt.

Table 6.2 Indicative budget for each hazard in the National DM Plan

No.	HAZARD	INDICATIVE BUDGET (Billion Rp.)
1.	Earthquake	12,489.0
2.	Tsunami	4,007.5
3.	Volcanic Eruption	931.0
4.	Land Mass Movement	1,111.6
5.	Flood	2,150.0
6.	Drought	650.2
7.	Forest and Land Fires	474.5
8.	Erosion	380.5
9.	Building and Housing Fires	312.5
10.	Extreme Wave and Abrasion	241.5
11.	Extreme Weather	197.0
12.	Technological Failure	151.5
13.	Epidemics and Disease Outbreaks	210.5
14.	Social Conflict	156.5
	TOTAL	**23,463.8**

Based on the types of hazard **(**Table 6.2**)**, the disaster management plan for earthquake has the biggest budget allocation, i.e. Rp 12,489,000,000 for five years or an annual average of Rp 2,497,800,000. It is because of the need to allocate

rehabilitation and reconstruction budget for post-earthquake West Java and West Sumatra in the amount of Rp 8,000,000,000. On the other hand, the budget for technological failure disaster and social conflict is the smallest, with Rp 151,500,000,000 and Rp 156,500,000,000 respectively, or an annual average of less than Rp. 32,000,000,000.

6.2 FINANCING

The source of funding for the implementation of the disaster management plan will be obtained from the State Revenue and Expenditure Budget (APBN), the local and regional Revenue and Expenditure Budget (APBD), and contribution from the private sector as well as donor agencies. Budget from the APBN will be allocated every year through the line Ministries/Agencies to ensure the sustainability of the disaster management efforts. Similarly, at the local level disaster management initiatives funded through the APBD will be allocated annually through the budget of local government units.

The budget for the conduct of disaster management is not an on-top budget to the Ministries/Agencies' budget but will be integrated into existing budget items that are related to disaster management. This means that most of the resources and funding for disaster management will be integrated into existing government development activities that are funded from the State Revenue and Expenditure Budget. The specific hazard-related programs in the National DM Plan will be funded by each line ministry/agency responsible for the hazard and general disaster management programs will be funded through BNPB's budget.

In addition to funding by the government, disaster management programs and activities may also be funded through donor's support, assistance from the private sector and through the self-help funding from the community. Financing from the APBN will comply with the budgeting system regulated through the Decree of the Minister of National Development Planning/Head of National Development Planning Board and the Minister of Finance. This means that the implementation of the programs and activities in the National DM Plan 2010-2014 should comply with budget item nomenclatures that refer to the annual Government Work Plan (RKP). The budget mechanism for funds originated from non-government sources will be regulated in compliance to the regulations of each agency or institution. Foreign donors' assistance, in line with Government Regulation Number 23 Year 2008 on the Involvement of International Agencies and Foreign Non-Government Organizations in Disaster Management, should be conveyed or directly sent to BNPB.

As stipulated in Law Number 24 Year 2007 on Disaster Management and Government Regulation Number 22 Year 2008 on the Financing and Management of Disaster Assistance, disaster management budget will be utilized by the Government, Local Government, BNPB and/or BPBD in line with their key duties and responsibilities. Disaster management budget may be used in a normal situation, during emergency response and in a post disaster situation. In a normal situation, disaster management budget is allocated for disaster risk reduction programs. While there is a potential of a disaster event, disaster management budget will be allocated for preparedness programs, development of early warning systems and disaster mitigation activities. To anticipate the needs for disaster emergency response, the government allocates on-call budget that should be made available for actual emergency response operations. For post disaster needs, the government allocates social grants to be provided for local governments. Local governments request this fund to the national government through BNPB.

The application for disaster management budget from vertical units in the regions (the Armed Force, Police, Regional Offices, offices of the line Ministries/Agencies) is regulated through Law Number 17 year 2003 on State Finance, Government Regulation Number 24 Year 2004 on the Formulation of Work Plan and Budget of the State Ministries/Agencies, and its ancillary regulations (respective Minister/Head of Agency Regulation) with reference to the local disaster management plans.

CHAPTER VII

MONITORING, EVALUATION AND REPORTING

Monitoring and evaluation aim at ensuring that the implementation of development programs and activities will be in line with the plans. Control of the implementation of development is conducted to ensure the achievement of development goals and objectives. The monitoring and evaluation of programs and activities in the National DM Plan will be carried out by referring to the following regulations:

1. Law Number 15 Year 2004 on the Inspection, Management and Responsibility of State Finance.
2. Law Number 25 Year 2004 on the National Development Planning System.
3. Government Regulation Number 2 Year 2006 on the Mechanism of Foreign Loans and/or Reception of Foreign Grants and Continuation of Foreign Loans and/or Grants.
4. Government Regulation Number 8 Year 2006 on Financial Reporting and Performance of Government Institutions.
5. Government Regulation Number 39 Year 2006 on the Mechanism of Monitoring and Evaluation of the Implementation of Development Plans.
6. Joint Decree of the Minister of Finance and Minister of National Development Planning/Head of Bappenas No. Kep-102/Mk.2/2002 and No. Kep. 292/M.Ppn/09/2002 on the System for Monitoring and Reporting of the Implementation of Development Projects.

7.1 MONITORING AND EVALUATION

Monitoring meant here is the activity to observe the progress of the implementation of the National DM Plan and to identify as well as anticipate possible emergence of problems, so that they can be prevented or solved as early as possible. Monitoring is carried out to observe the progress in the delivery of funds, achievement of outputs and emerging constraints. Monitoring needs to be done regularly to obtain accurate information of the implementation of the activities, the performance of the program and the results achieved. In addition to identifying and solving the problems faced,

the activity will also be useful in increasing the efficiency and effectiveness in the implementation of the National DM Plan and in promoting transparency and accountability in the conduct of disaster risk reduction activities.

Monitoring (and evaluation) is conducted using the principles of ***Efficiency***, that is the degree of interrelatedness between the goods/services produced by a program/ activity and the resources needed to produce the goods/services that is measured by the cost per unit output; ***Effectiveness***, that is the degree of how far a program/ activity reaches its desired result and benefit; and ***Benefit***, that is the expected condition if the output can be accomplished within the timeframe, in the right location and the right target, and can function optimally. Besides the three principles, monitoring needs also to consider the aspects of Consistency, Coordination, Consultation and Sustainability of the implementation of a program/activity planned.

Monitoring of the National DM Plan will be carried out by the top management in the line Ministries/Agencies in accordance to their respective duties and responsibilities. Monitoring may also involve the civil society (for instance through the National Platform for DRR), NGOs and professional associations. The active participation of external parties may be accommodated through working groups coordinated by the government. Monitoring may be done, among others, through field visit to the sites of disaster risk reduction programs and activities, meetings or discussions with program implementers to identify obstacles and constraints faced, and through examination of DRR activities based on the work plans in the National DM Plan. Monitoring reports have to be submitted once in six months (one semester).

Article 6 paragraph (6) Government Regulation Number 21 Year 2008 on the Conduct of Disaster Management stipulates that “Disaster management plan... needs to be reviewed regularly once in two years or anytime when there is a major disaster event”. The objective of regular evaluation is to assess the results of disaster risk reduction programs and activities, and their effectiveness and efficiency. Besides being assessed for their effectiveness and efficiency, disaster risk reduction programs contained in the National DM Plan need also to be measured for their benefit and sustainability.

Evaluation of the implementation of the National DM Plan will be done to program outputs in the form of goods or services and to program outcomes in the form of impact or benefit for the community and/or government. In principle, evaluation is a series of activities that compare the realization of program inputs, outputs and outcomes with the plan and benchmark. Evaluation is done based on the resources used and the performance indicators and targets of an activity and/or program performance indicators and targets. This activity is carried out in a systematic,

comprehensive, objective and transparent manner. The result of the evaluation will become the materials that will be considered for the formulation of the subsequent program plan.

Table 7.1 Monitoring and evaluation format

Activity	Location	Target (Follow - up)	Realization Source of Financing		Notes
			APBN	Others	

Evaluation is useful for program management in the future and will also ensure accountability and help increase efficiency and effectiveness in the allocation of resources and budget. Next to comparing between the targets and achievement of the predetermined performance indicators in the National DM Plan, evaluation can also be done by assessing the impacts produced by the implementation of the plan. Both methods can provide information useful for planning and controlling the implementation of the National DM Plan. As in monitoring, the evaluation of the implementation of the National DM Plan will also be done by the top management in the line Ministries/Agencies in line with their respective duties and responsibilities. Evaluation may involve external parties, but it needs to be done under the coordination of relevant government institutions. Evaluation report has to be submitted once in a year.

7.2 REPORTING

The implementation of disaster risk reduction programs and activities needs to be reported in a written document. The report has to be prepared once in a year and one copy of the report has to be sent to BNPB to be integrated into the national yearly report. It is expected that all activities related to disaster management in Indonesia will be well documented and officially reported to the community by BNPB.

By the end of the second and fourth year of the implementation of the DM Plan, BNPB will coordinate a review or mid-program evaluation that involves all ministries/

agencies and other relevant stakeholders. By the end of the fifth year, a summative and comprehensive evaluation will be done to examine the overall implementation of the plan and the result will be put into a final report that will contain records about

Annex 1.

Definition of Terms

(1) **Disaster** is an event or a series of events that threatens the lives and livelihood of community, which are caused by natural and/or non-natural factors or human factors, and result in deaths, environmental destruction, asset losses and psychological impacts.

(2) **The Conduct of Disaster Management** is a series of efforts that include formulation of risk sensitive development policies, disaster mitigation activities, disaster emergency response and rehabilitation.

(3) **Disaster Prevention** is a series of activities implemented to reduce or omit disaster risks, both through the reduction of disaster threat or the vulnerability of those threatened by hazards.

(4) **Preparedness** is a series of activities implemented to anticipate disaster through the organization of training and other appropriate and effective measures.

(5) **Early Warning System** is a series of activities implemented to provide an immediate warning to the community related to the potential of a hazard occurring in a certain place by the authorized agency.

(6) **Mitigation** is a series of activities implemented to reduce disaster risks, both through physical development and efforts to enhance the capacity in dealing with disaster threats.

(7) **Disaster Risk** is the potential losses incurred by a hazard in a certain place and certain time that may take the form of lost lives, injury, sickness, lives threatened, loss of security, evacuation, damage or loss of assets and disruption to community's activities.

(8) **Disaster Emergency Response** is a series of activities implemented immediately after disaster to deal with the adverse impacts of disaster, which include search and rescue, evacuation, protection of assets, fulfillment of basic needs, protection, management of evacuees, and emergency recovery of public infrastructures and facilities.

(9) **Rehabilitation** is the repair and recovery of all public service aspects to a sufficient degree in disaster-affected areas with the primary objective of returning service to normal or making all aspects of governance and community livelihood operational.

(10) **Reconstruction** is the rebuilding of all infrastructures, facilities and institutions in disaster-affected areas, at the government or community level with the primary targets of achieving progress and development of economic activities, social and cultural activities, law and order, and the enhancement of the role of the community in all aspects of community lives in disaster-affected areas.

(11) **Central Government**, which subsequently is called the Government, is the President of the Republic of Indonesia who holds authority over the government of the Unitary State of the Republic of Indonesia as stipulated in the Constitution of the Republic of Indonesia Year 1945.

(12) **Local Government** is the Governor, Head of District/City Mayor or local government units as the implementer of local governance.

(13) **National Agency for Disaster Management**, which is called BNPB, is a non-ministerial government agency that is regulated by the relevant law.

(14) **Local Disaster Management Agency**, which is called BPBD, is a local government body that implements disaster management in the regions.

(15) **Long Term Development Plan**, which is shortened as RPJP, is a planning document for the timeframe of 20 (twenty) years.

(16) **Middle Term Development Plan**, which is shortened as RPJM, is a planning document for the timeframe of 5 (five) years.

(17) **Middle Term Development Plan of Ministries/Agencies**, which is called as Strategic Plan of Ministries/Agencies (Renstra-KL), is a planning document of Ministries/Agencies for the timeframe of 5 (five) years.

(18) **Middle Term Development Plan of Local Government Units**, which is called as Renstra-SKPD, is a planning document of Local Government Units for the timeframe of 5 (five) years.

(19) **National Annual Development Plan**, which is called as Government Work Plan (RKP), is a national planning document for the timeframe of 1 (one) year.

(20) **Local Annual Development Plan**, which is called as Local Government Work Plan (RKPD), is a planning document of the regions for the timeframe of 1 (one) year.

(21) **Annual Development Plan of Ministries/Agencies**, which is called as Work Plan of Ministries/Agencies (Renja-KL), is a planning document of Ministries/Agencies for the timeframe of 1 (one) year.

(22) **Annual Development Plan of Local Government Units**, which is called as Work Plan of Local Government Unit (Renja-SKPD), is a planning document of Local Government Units for the timeframe of 1 (one) year.

(23) **Vision** is a general statement of a condition desired to be achieved by the end of the implementation of a plan.

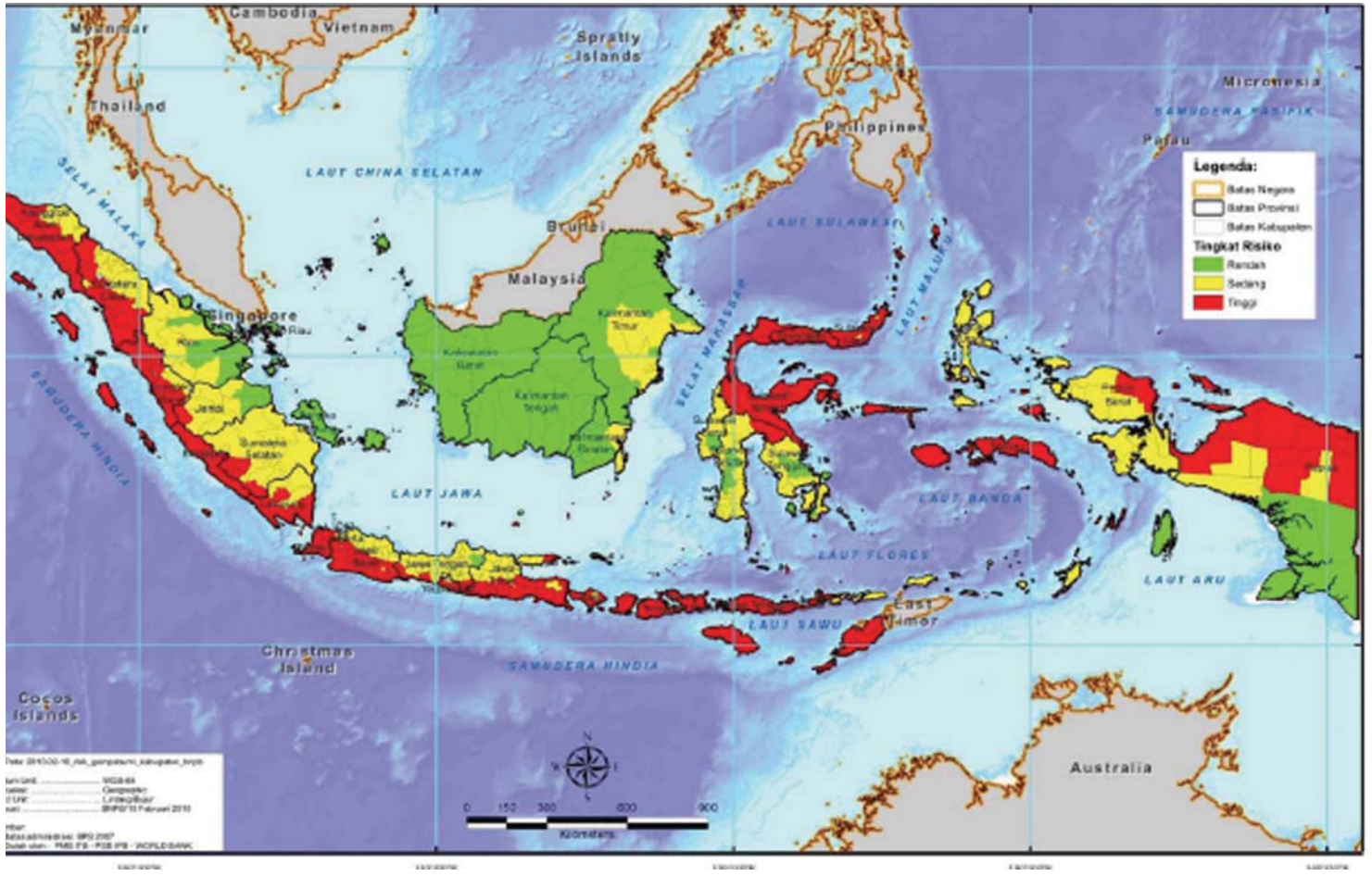
(24) **Mission** is general statement(s) of measures to be taken to realize the vision.

(25) **Strategy** is measures in the forms of indicative programs to realize the vision and mission(s).

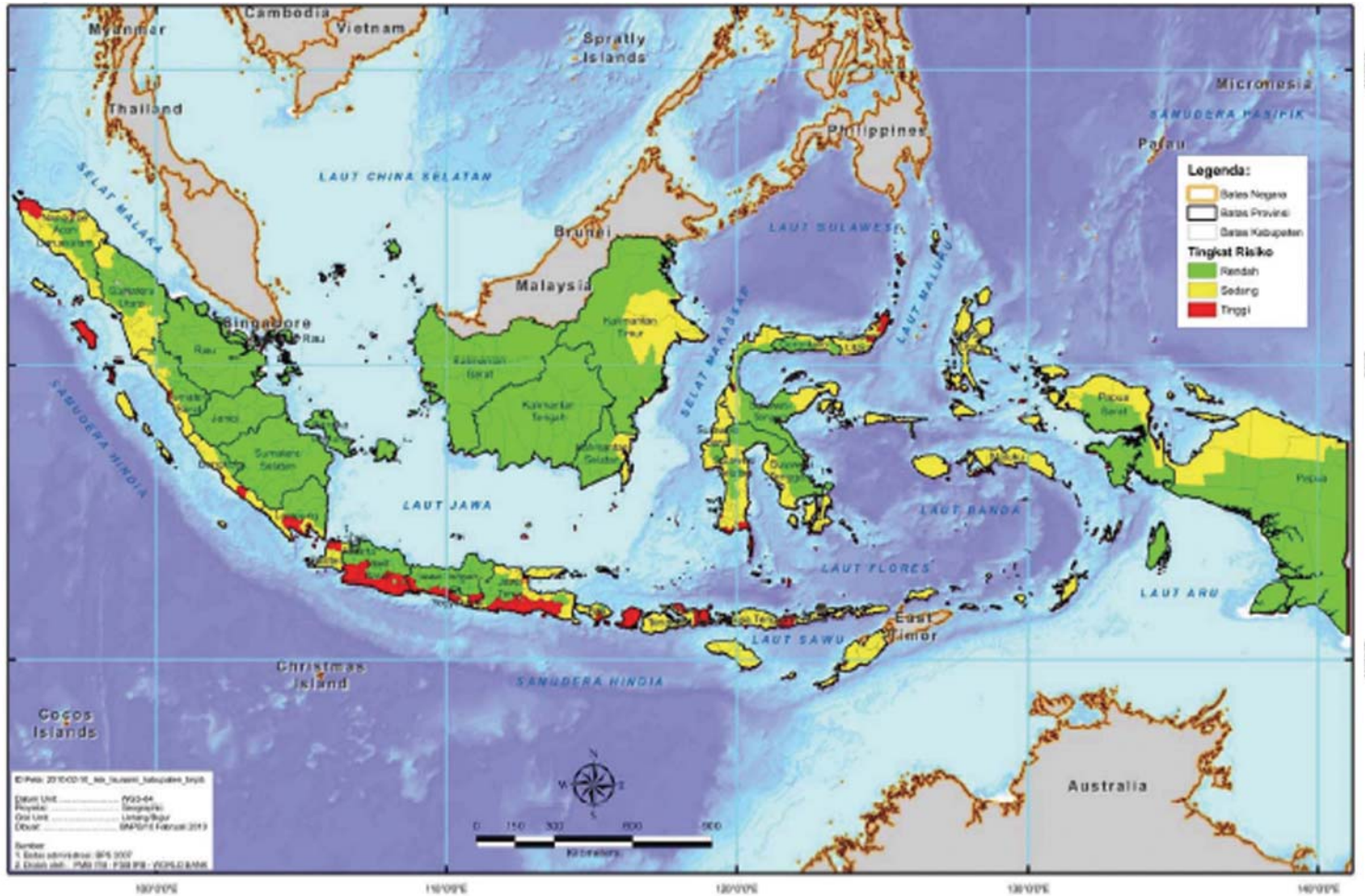
(26) **Program** is a policy instrument that contains one or more activities that will be implemented by government institutions/agencies to achieve targets and objectives, or community's activities coordinated by the government.

Annex 2. Disaster Risk Maps

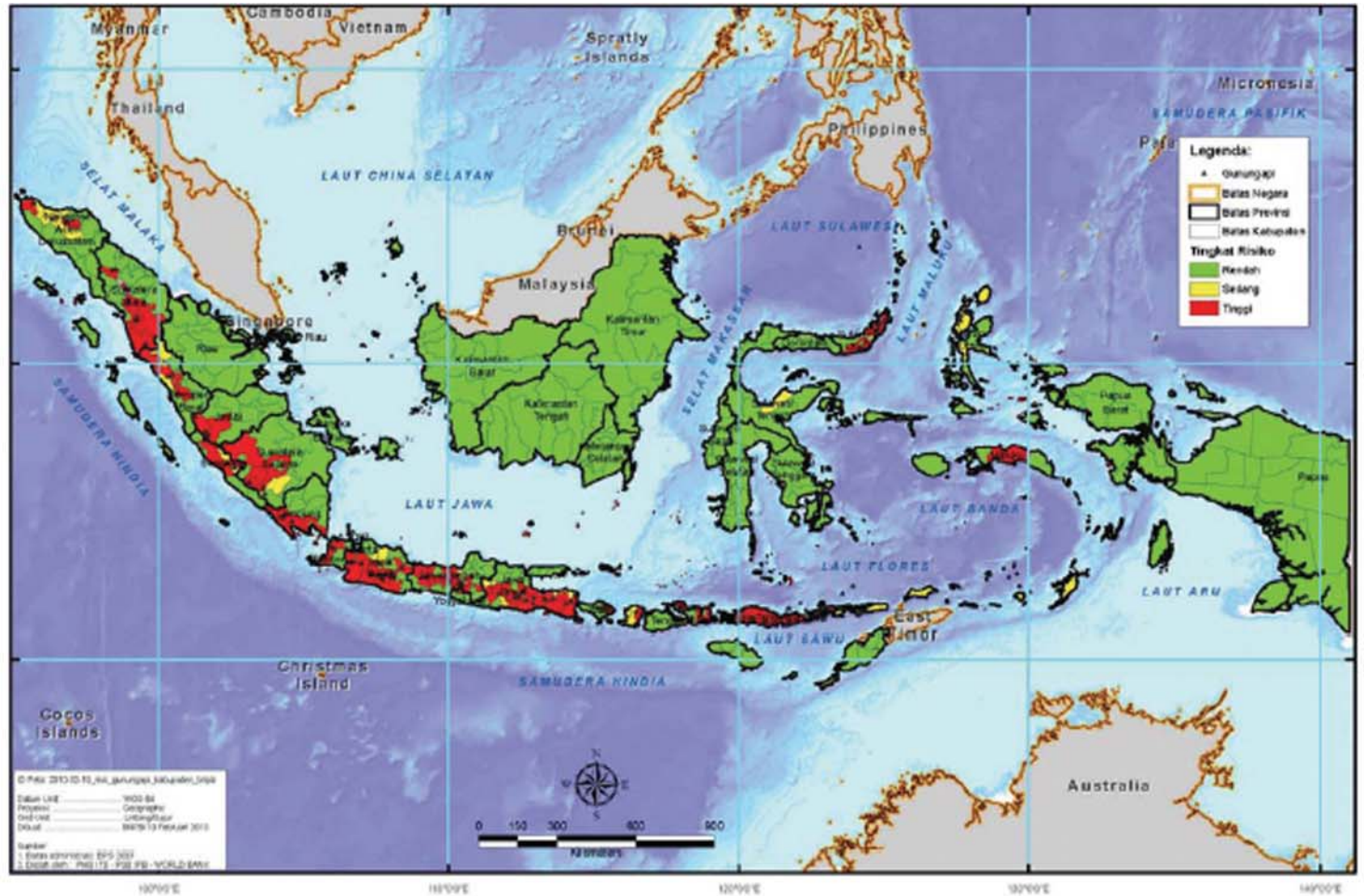
EARTHQUAKE RISK INDEX MAP IN INDONESIA



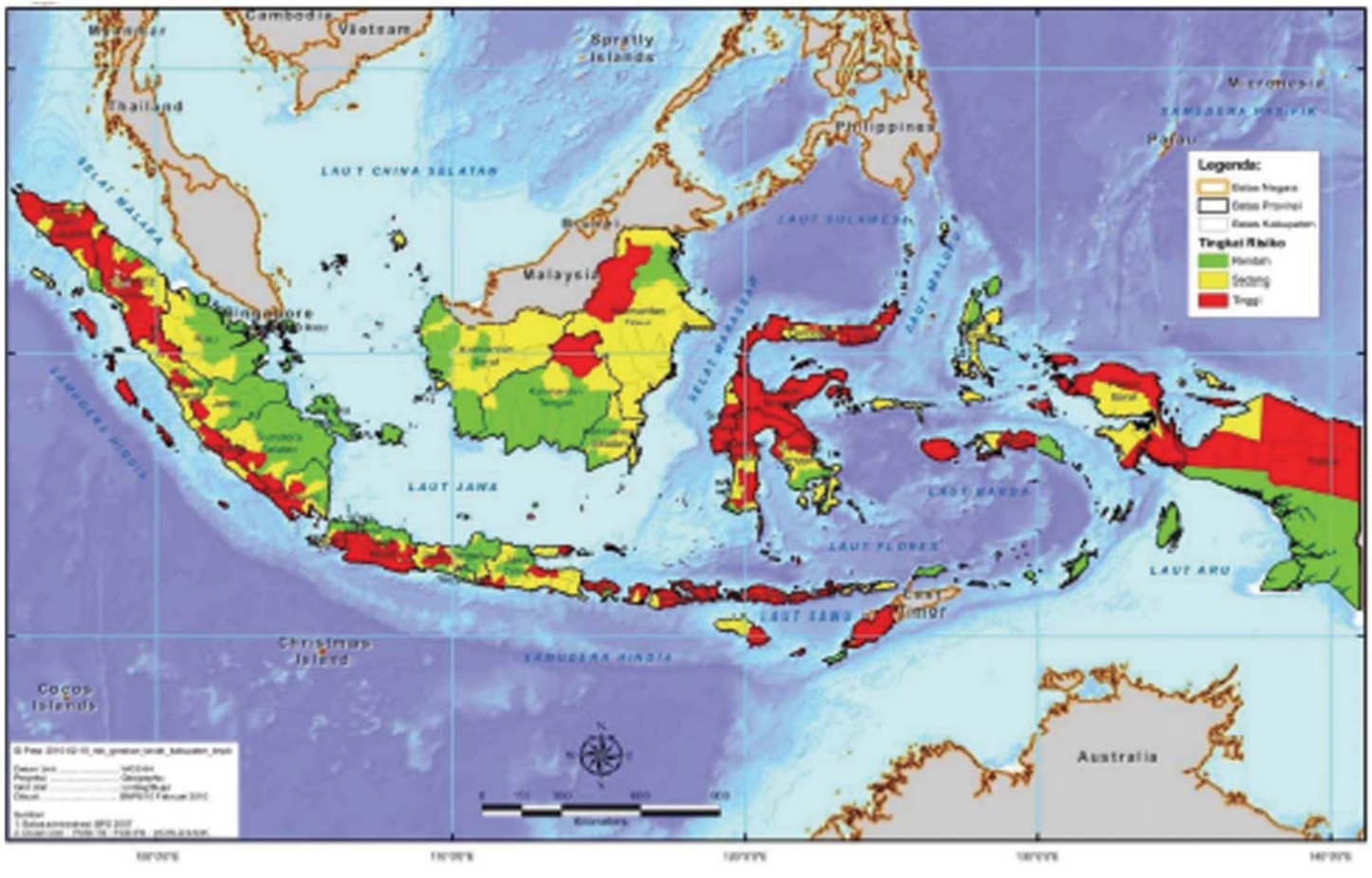
TSUNAMI RISK INDEX MAP IN INDONESIA



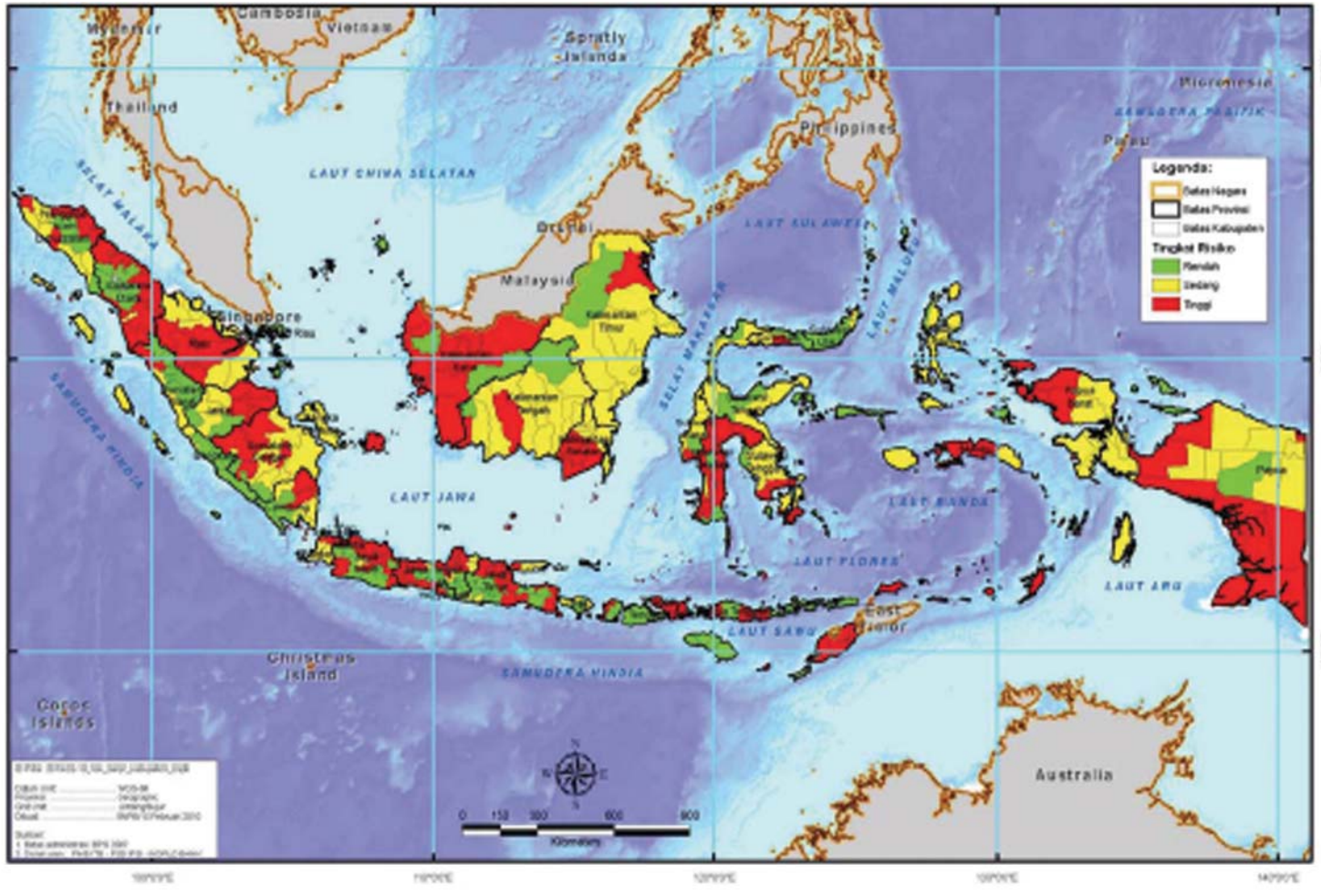
VOLCANIC ERUPTION RISK INDEX MAP IN INDONESIA



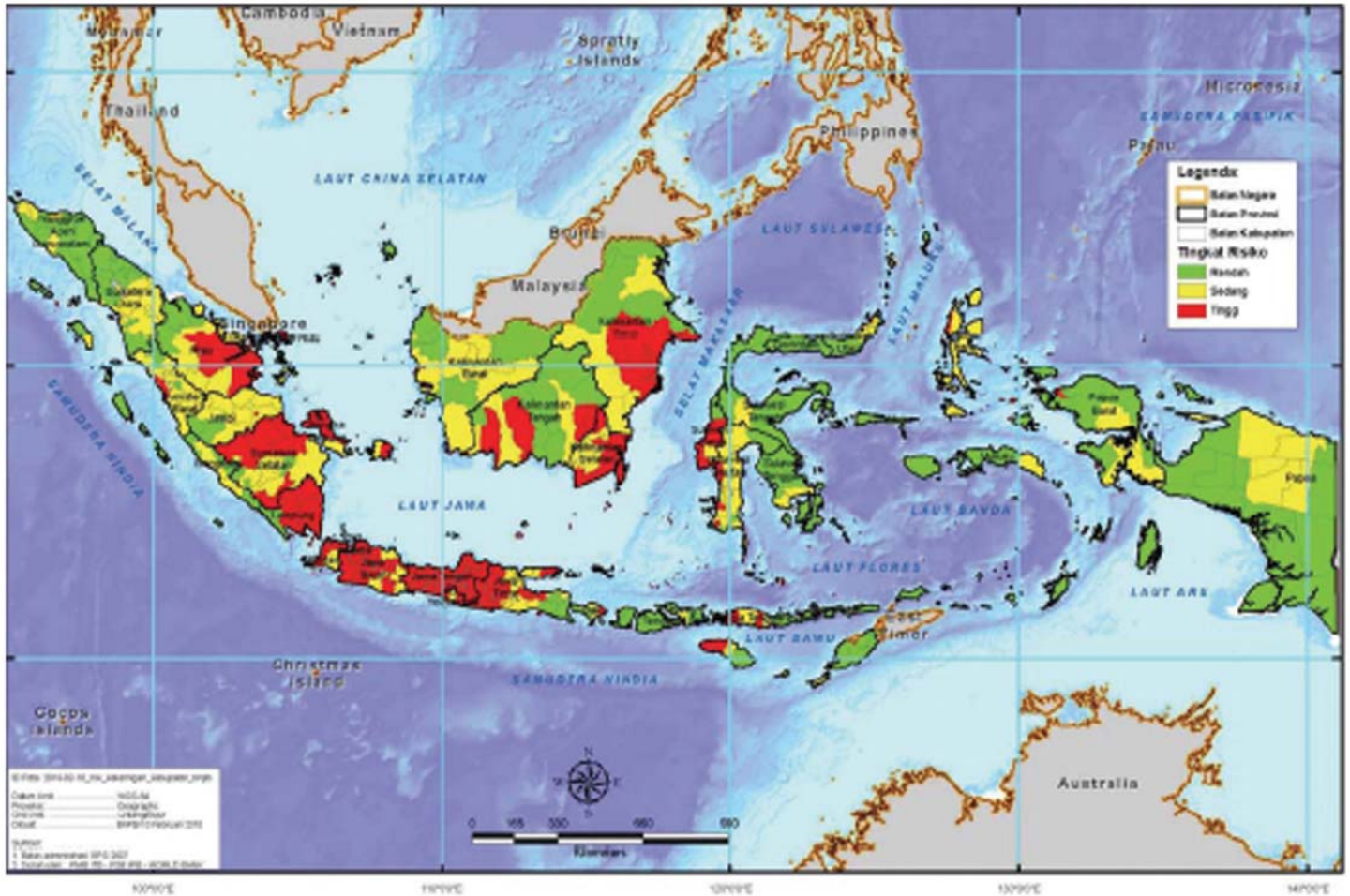
LAND MASS MOVEMENT RISK INDEX MAP IN INDONESIA



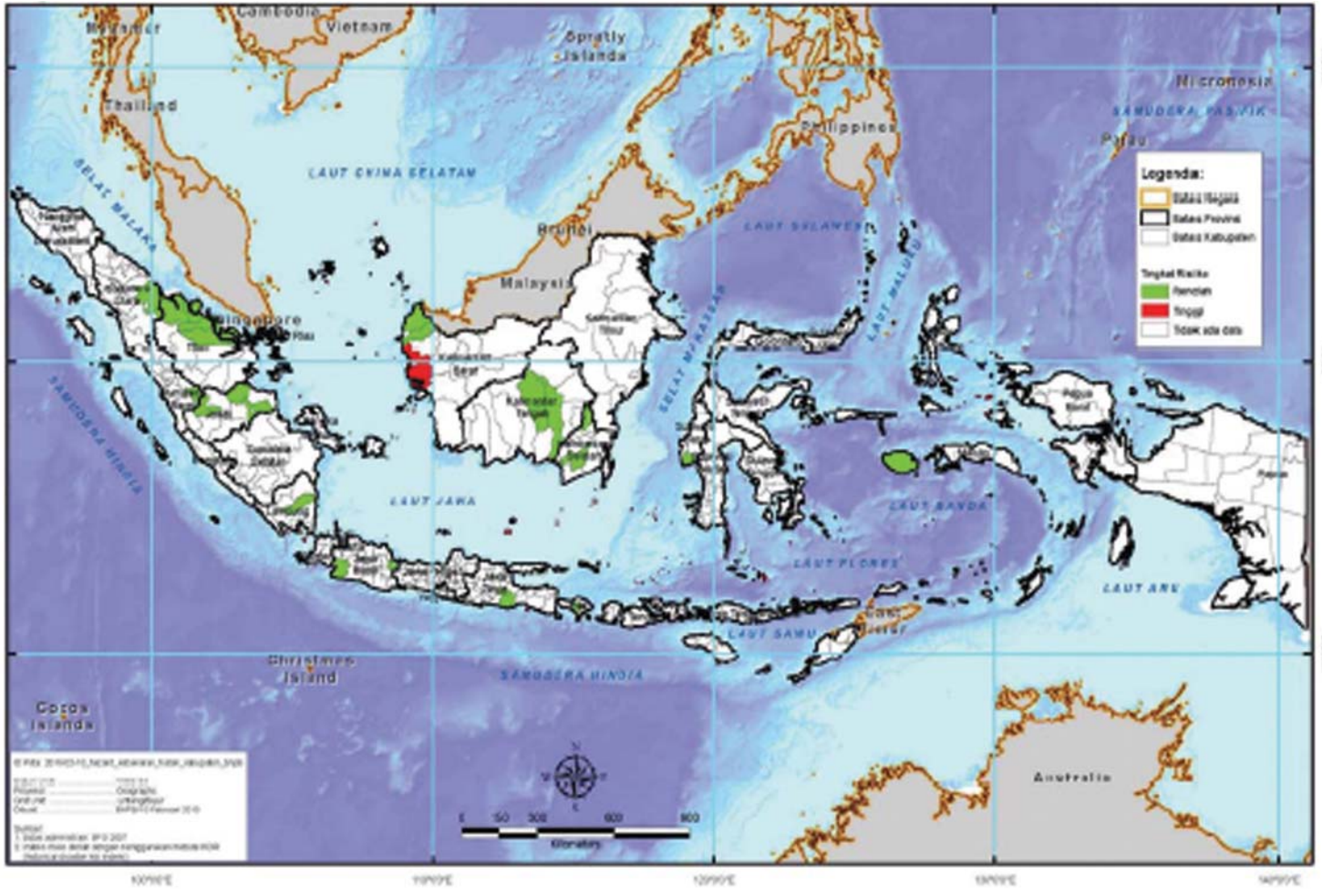
FLOOD RISK INDEX MAP IN INDONESIA



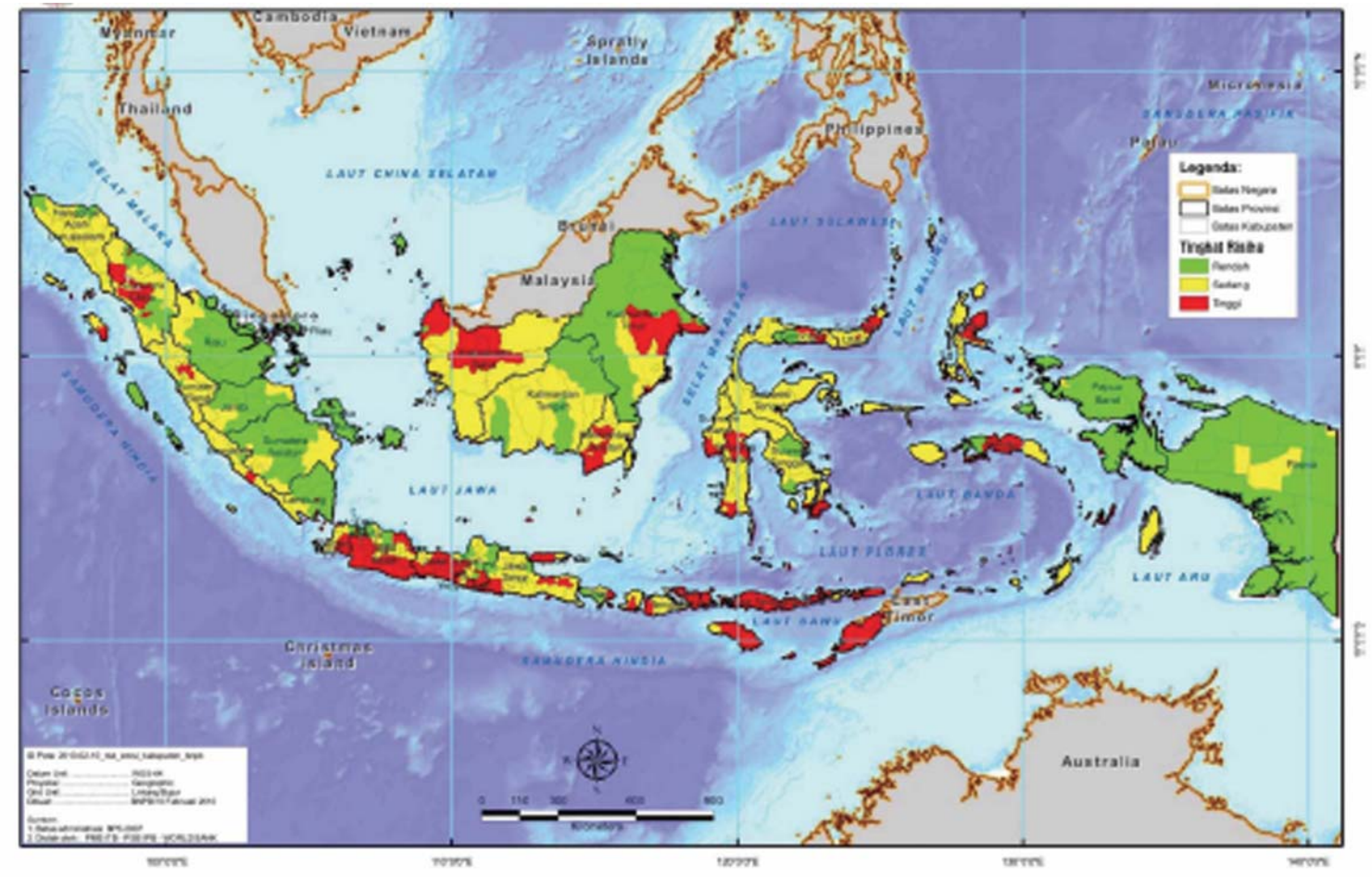
DROUGHT RISK INDEX MAP IN INDONESIA



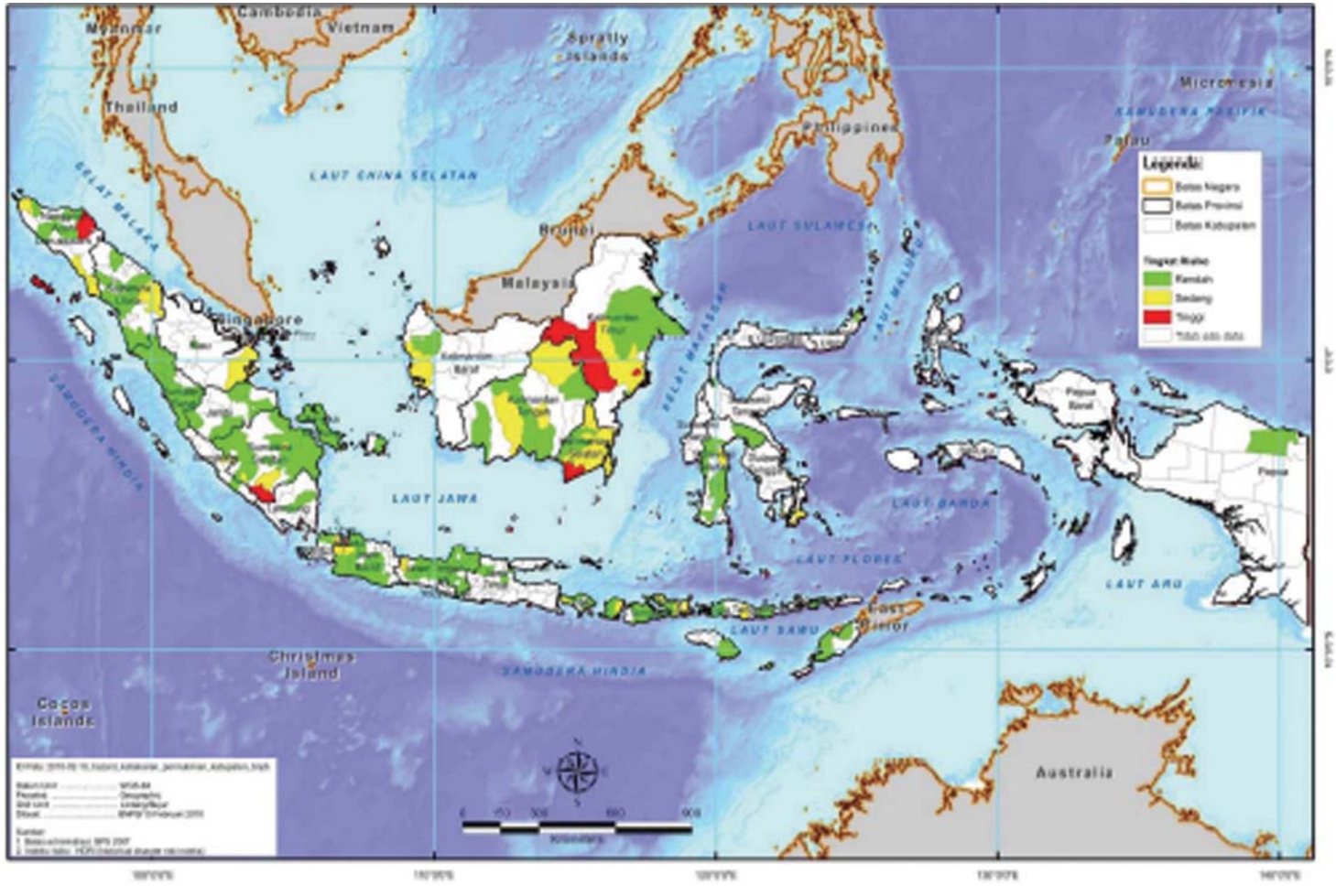
FOREST AND LAND FIRE RISK INDEX MAP IN INDONESIA



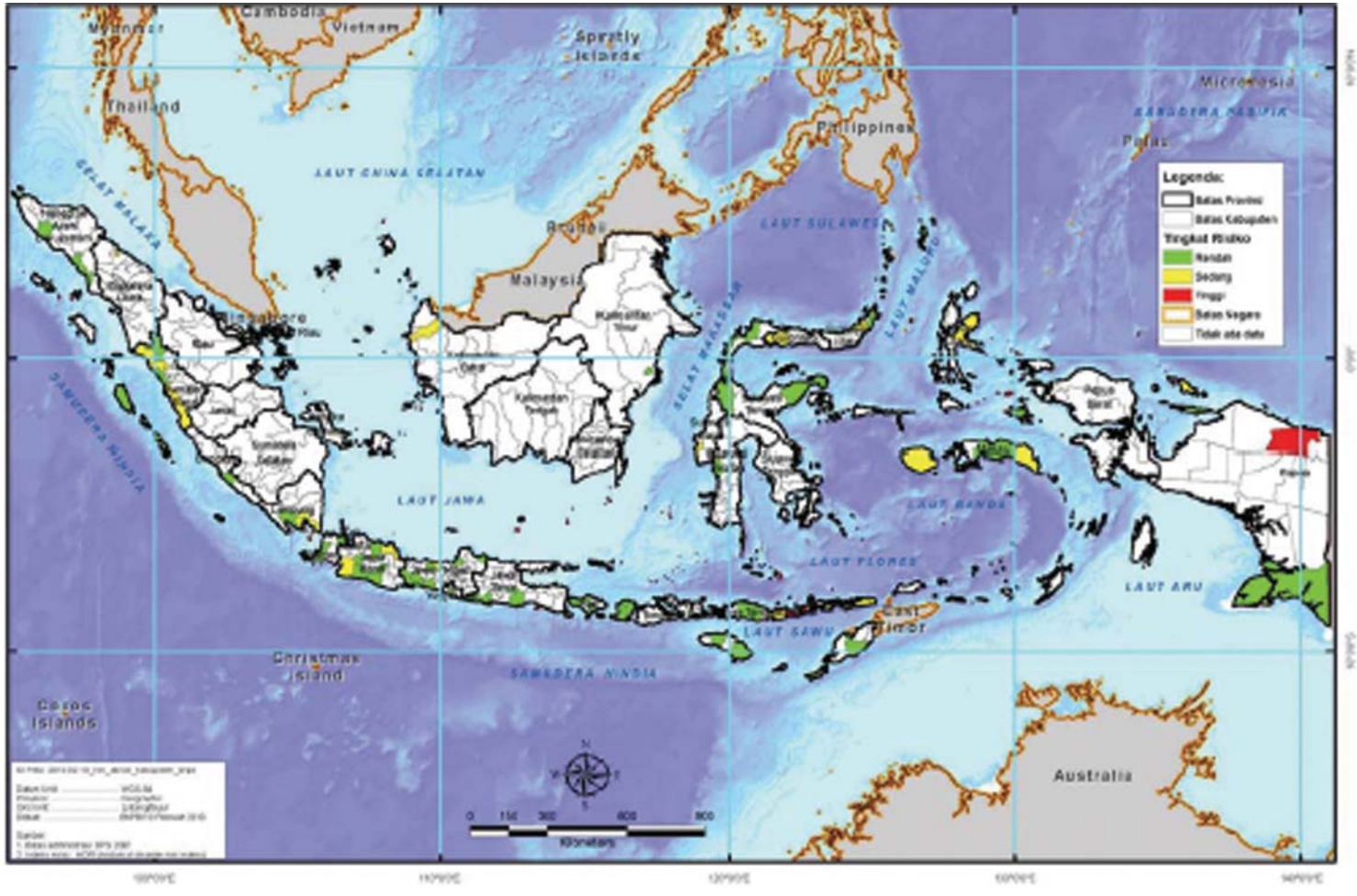
EROSION RISK INDEX MAP IN INDONESIA



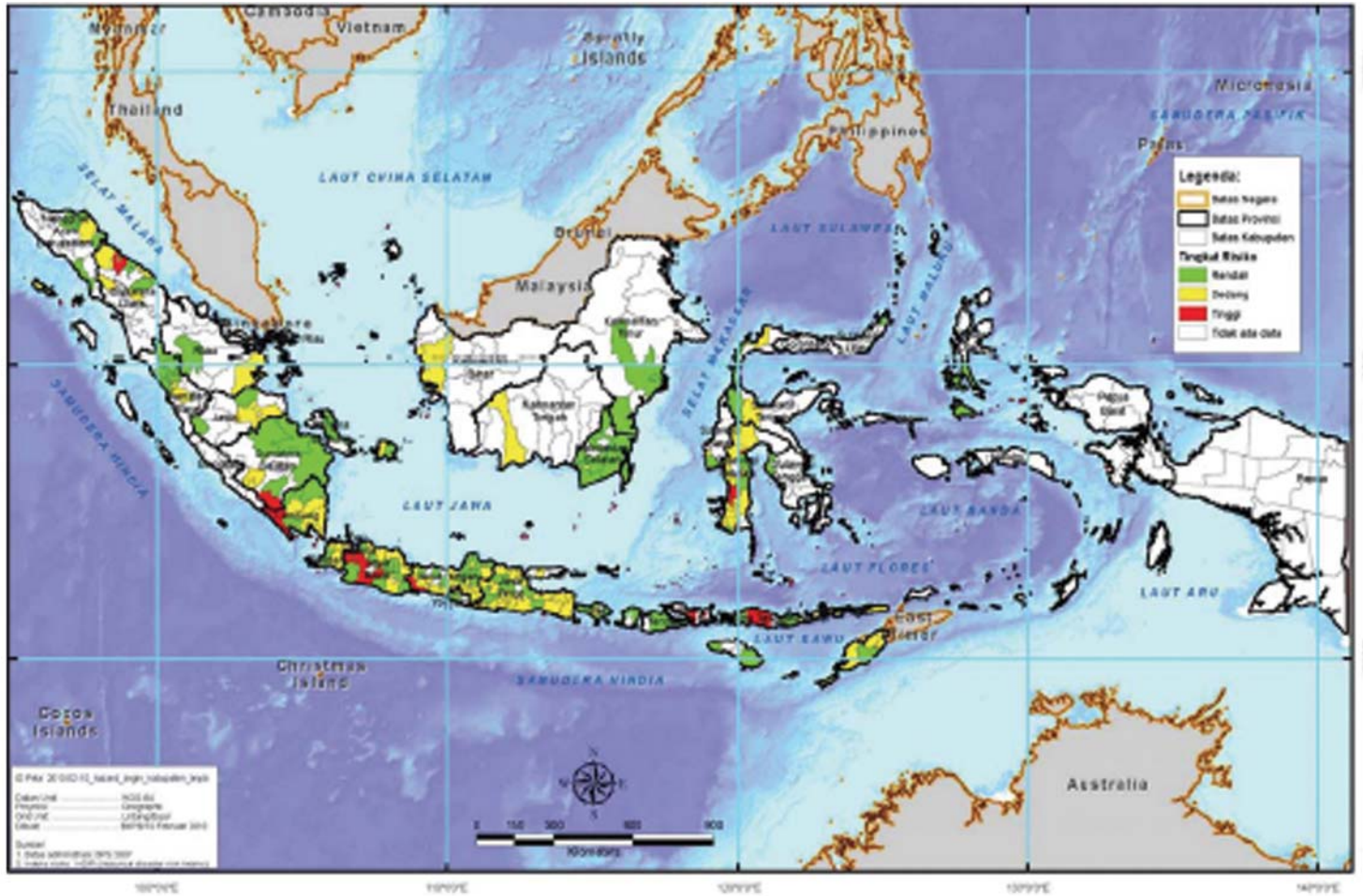
BUILDING AND HOUSE FIRE RISK INDEX MAP IN INDONESIA



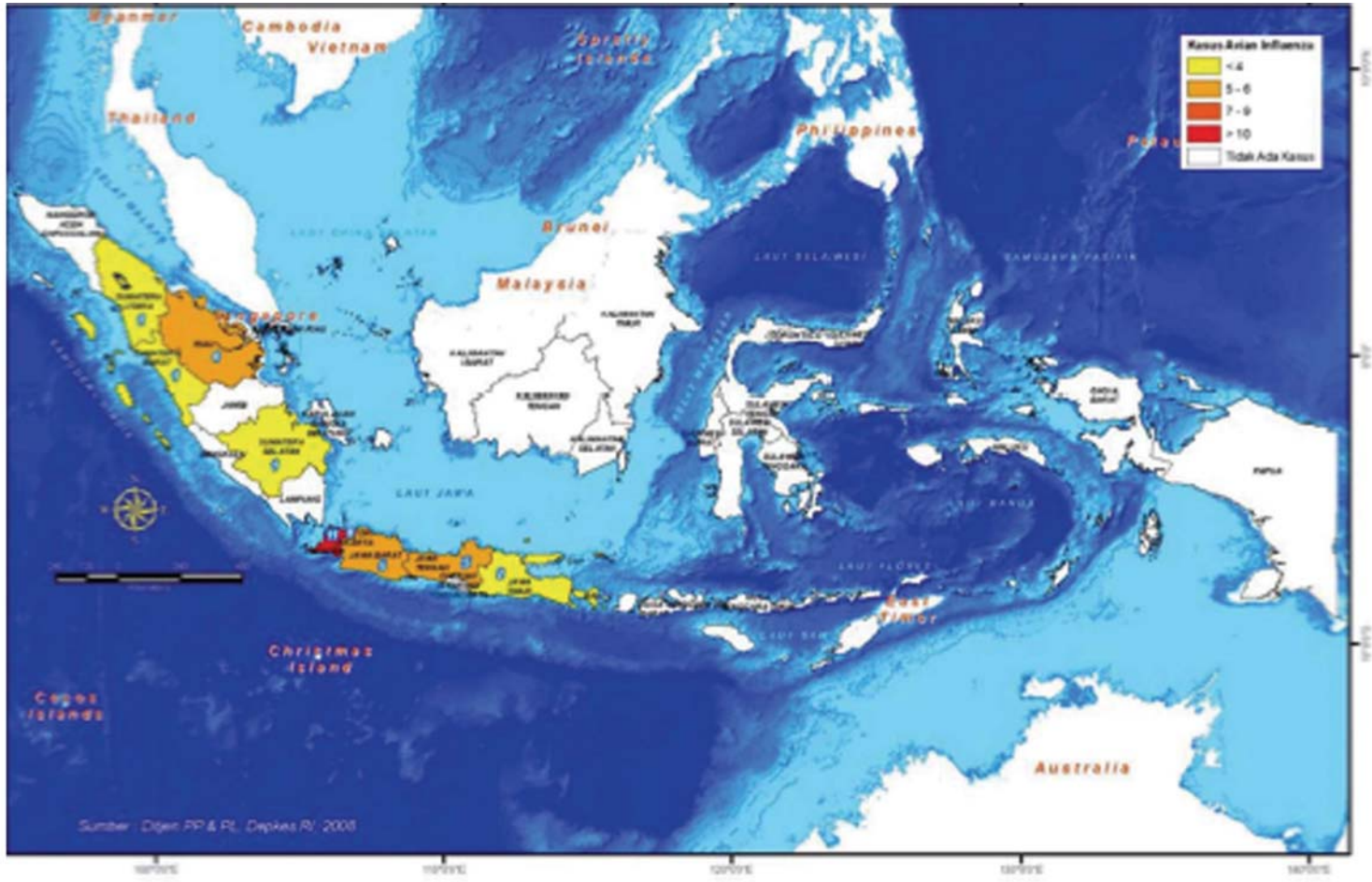
EXTREME WAVES AND ABRASION RISK INDEX MAP IN INDONESIA



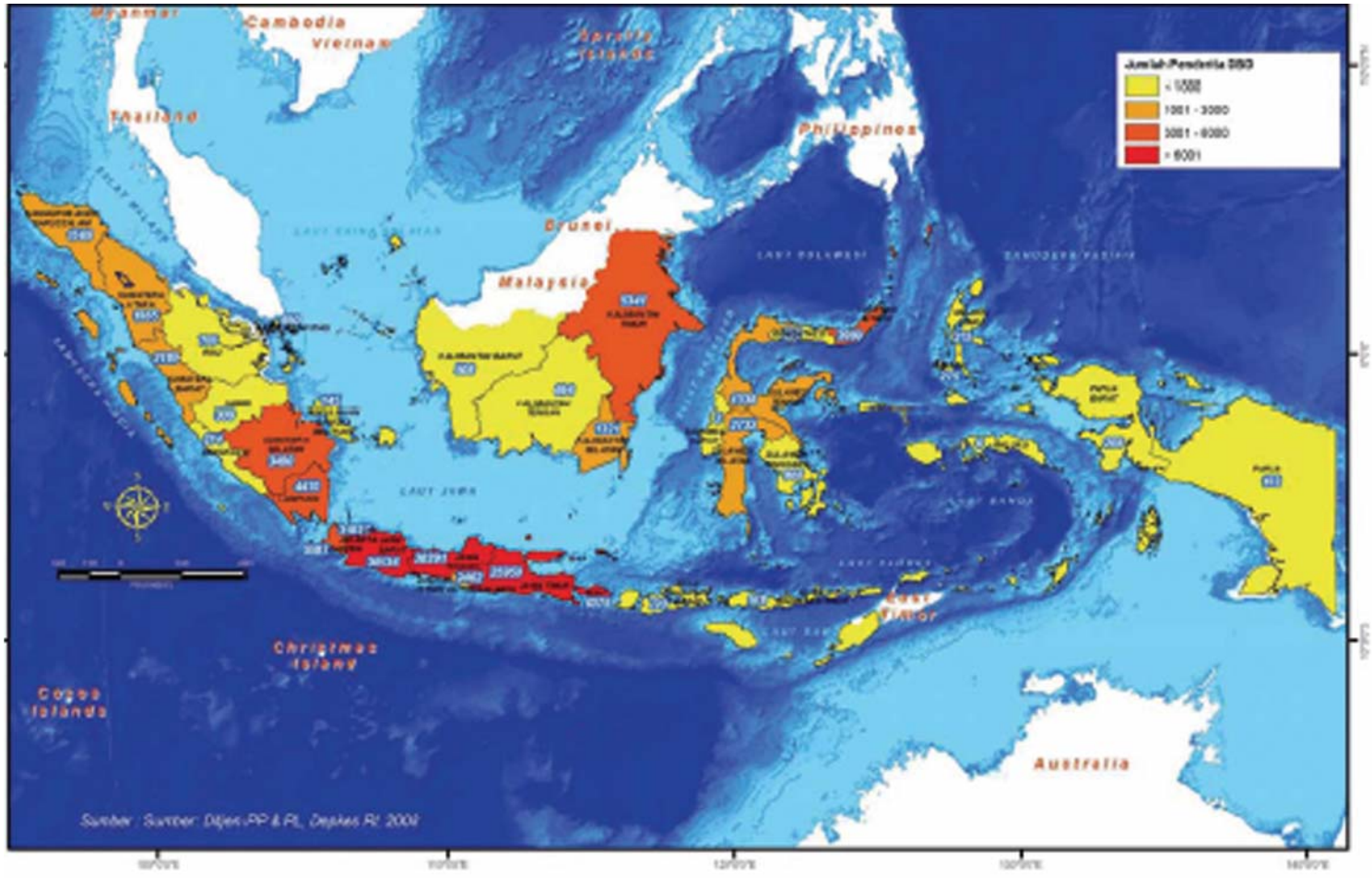
EXTREME WIND RISK INDEX MAP IN INDONESIA



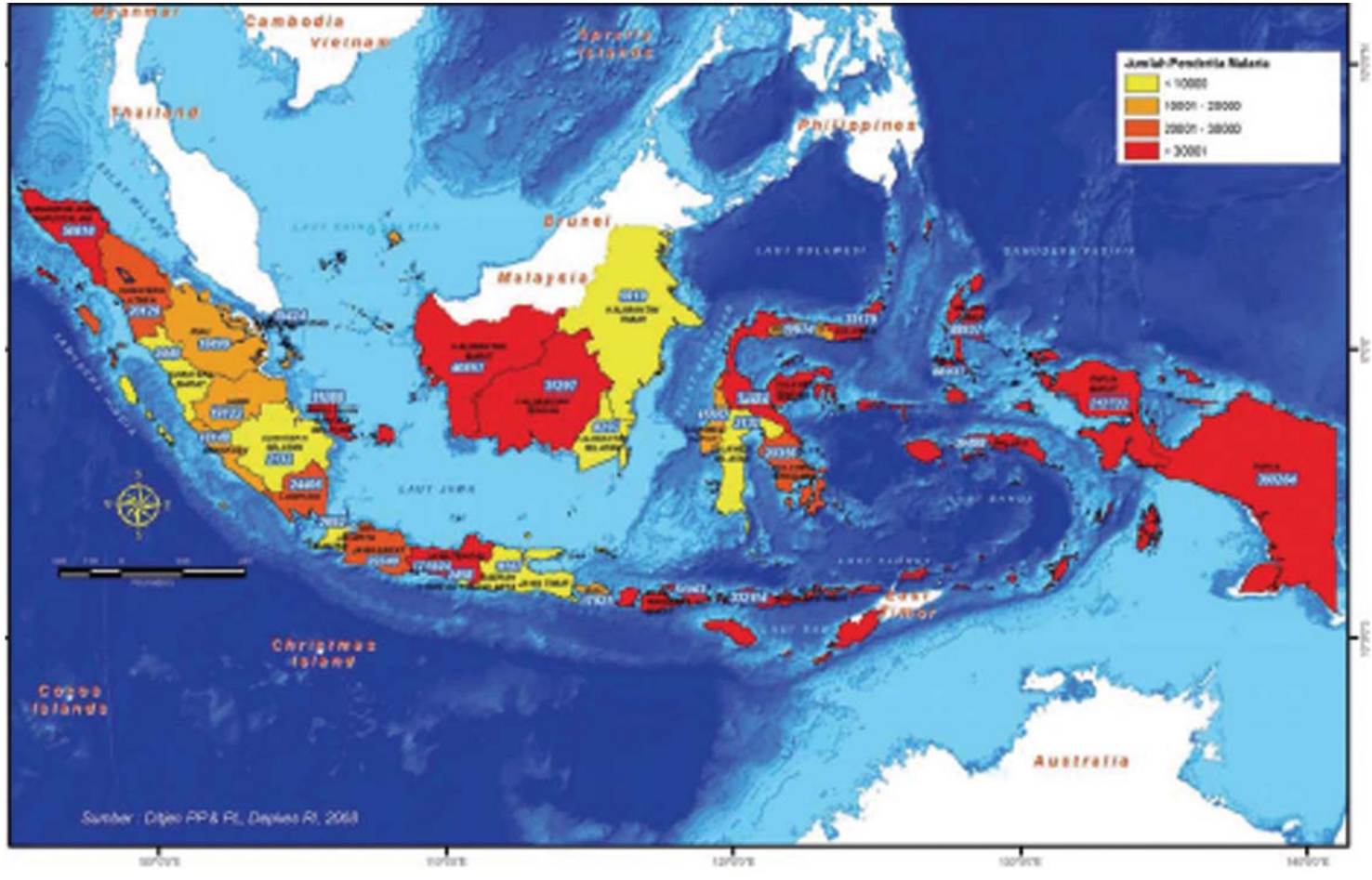
AVIAN INFLUENZA CASES MAP



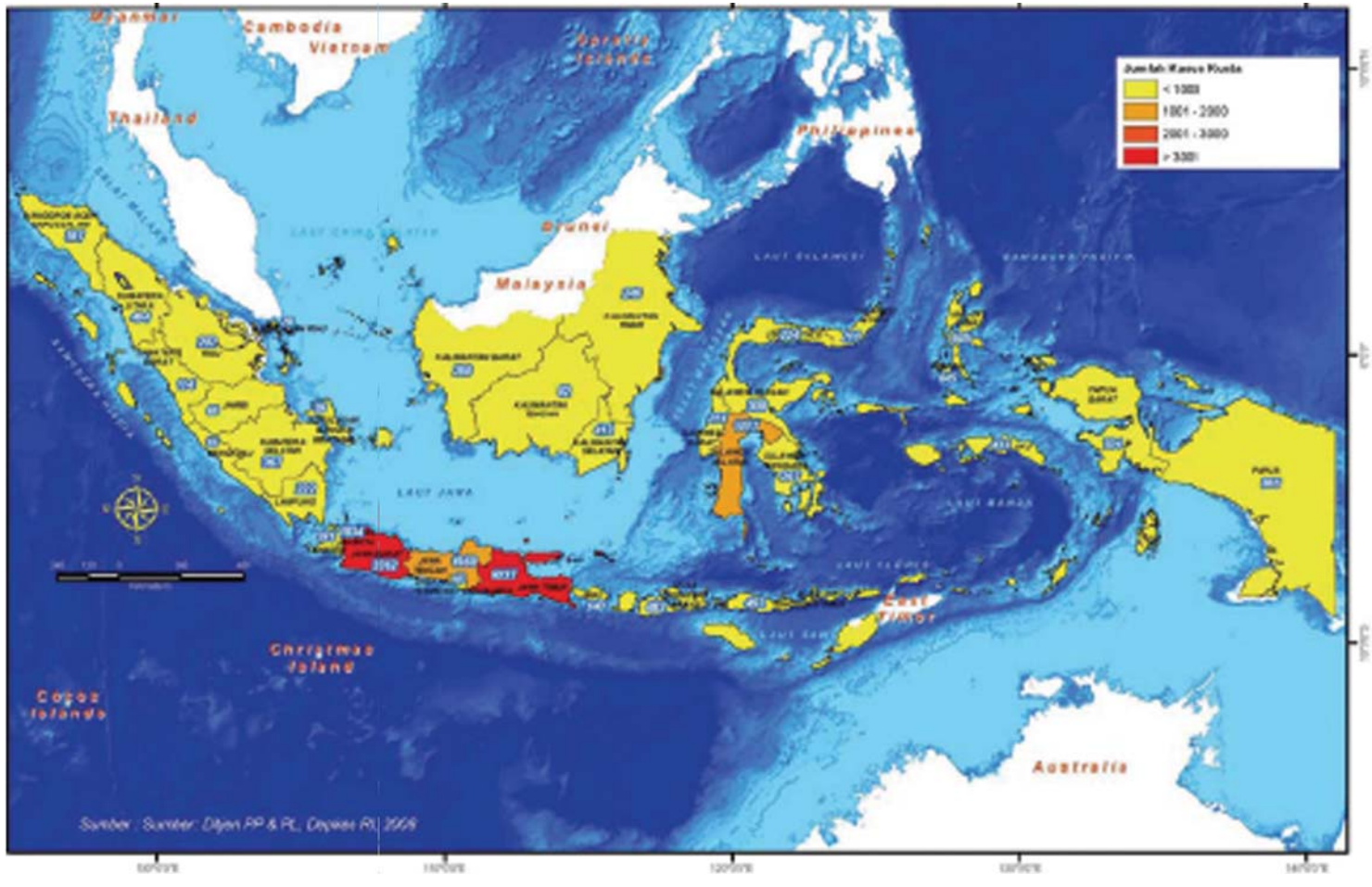
DENGUE CASES MAP



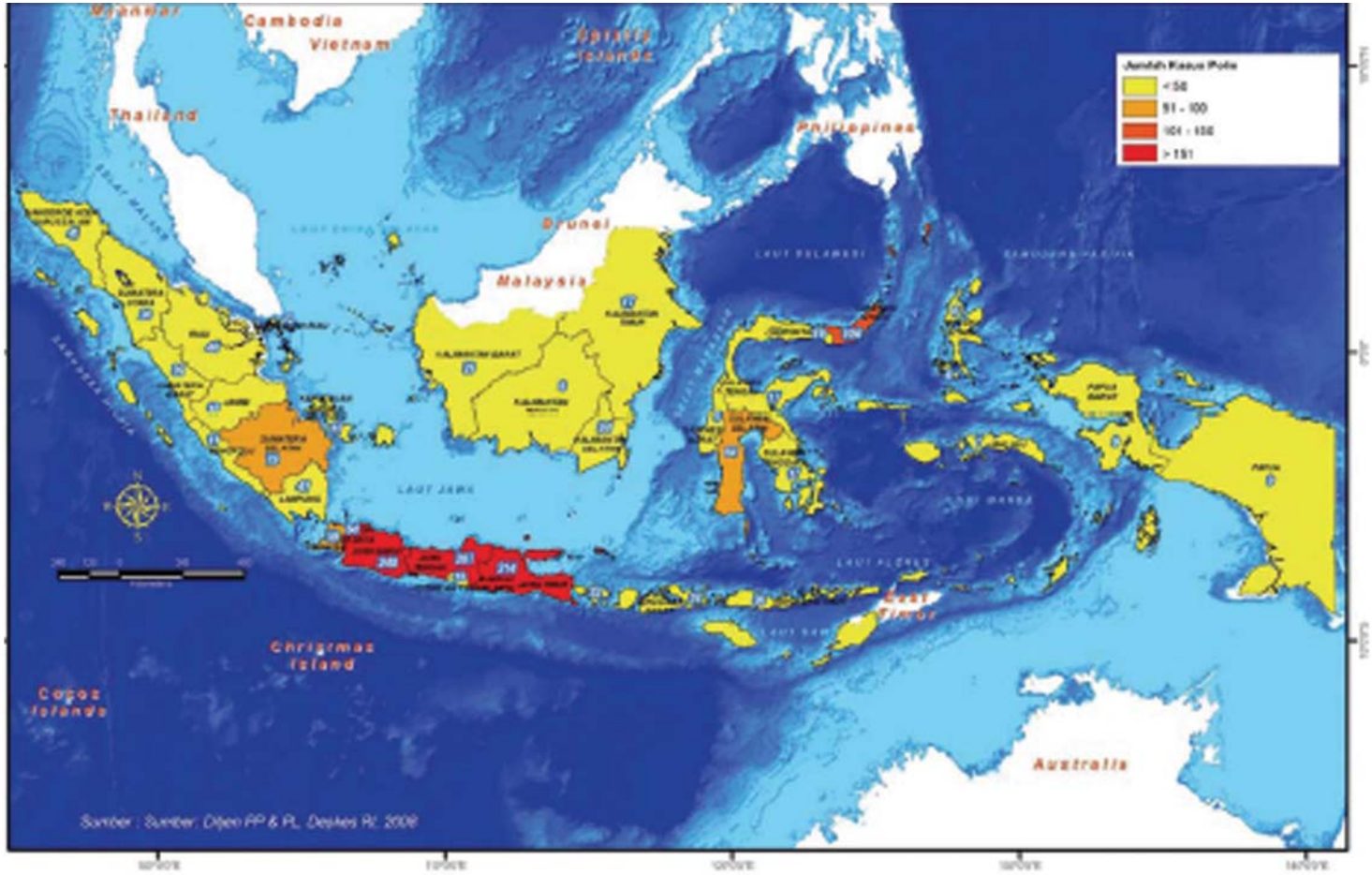
MALARIA CASES MAP



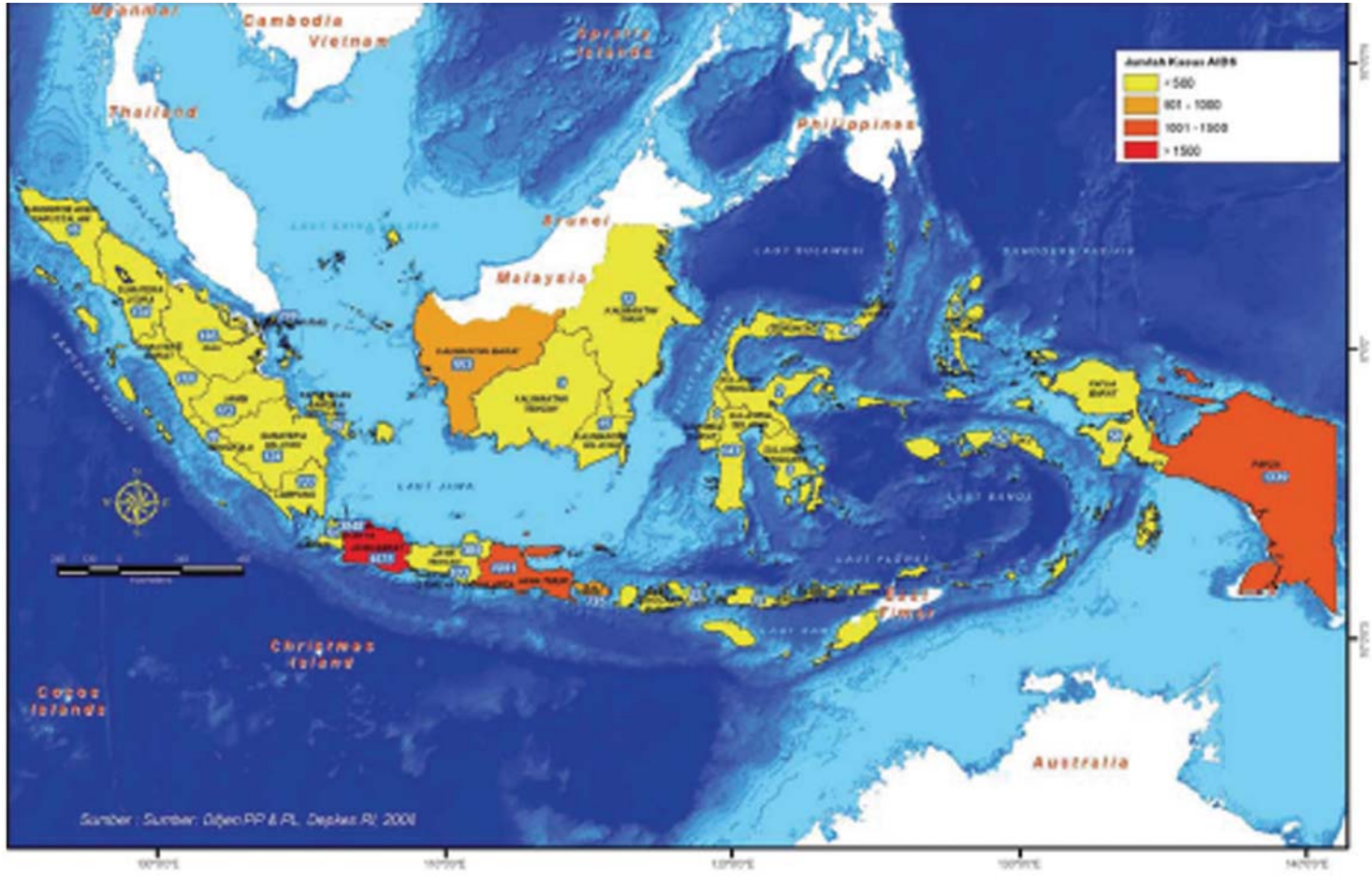
LEPER CASES MAP



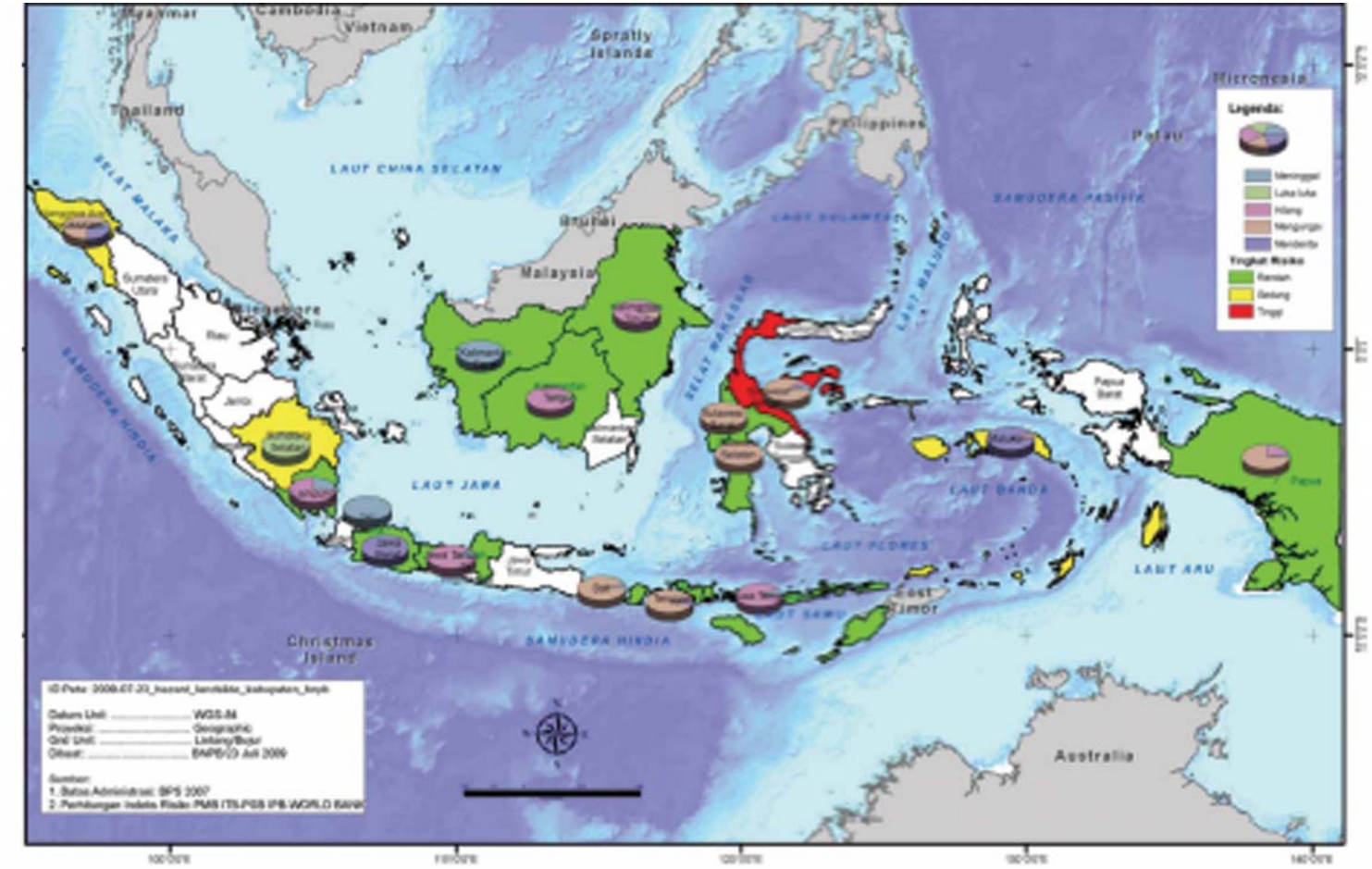
POLIO CASES MAP



AIDS CASES MAP



SOCIAL CONFLICT RISK INDEX MAP IN INDONESIA



Annex 3.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for generic program all hazards

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** ENHANCEMENT OF REGULATORY FRAMEWORK AND INSTITUTIONAL CAPACITY			
	1.1 Formulation of DM regulations, local regulations and DM SOPs that specify DM mechanism, including distribution of tasks, authority and resources, and coordination	DM regulations, local regulations and SOPs formulated at the central government and in 33 provinces and 275 districts/ cities	Key institution: - BNPB Relevant institutions: - MOHA - MOEMR - MOMAF - MOPW - BMKG - MOSA - MOH - Min. of Forestry - Ind. Armed Forces - RI National Police - Bakosurtanal - MORT - BPPT - LIPI - Basarnas - PMI	25 billion
	1.2 Establishment and strengthening of Local DM Bodies and their range of facilities (Emergency Operations Center, Local Rapid Response Teams, etc.)	Enhancement of BPBD in 33 provinces and establishment of BPBD in 275 districts/cities, and availability of supporting facilities	Key institution: - BNPB Relevant institutions: - MOHA - Min. of State Apparatus	350 billion
	1.3 Management capacity strengthening for disaster management in the regions	3.300 BPBD officials in 33 provinces trained on disaster management	Key institution: - BNPB Relevant institutions: - MOHA	16,5 billion
	1.4 Enhancement of human resource capacity in disaster management (technical) and provision of sufficient volunteers	40.000 technical staff of provincial BPBD and relevant local government units received DM technical training	Key institution: - BNPB Relevant institutions: - MOHA - MOSA - MOH - MOT - MOCI - MOPW - Min. of Forestry - MOEMR - BMKG - LIPI - BPPT - Basarnas - PMI	200 billion
	1.5 Empowerment of universities to facilitate capacity building for disaster management	33 DM Study Center established in Universities all over Indonesia	Key institution: - BNPB Relevant institutions: - MONE - University	16,5 billion
	1.6 Establishment of regional logistics	12 regional offices established	Key institution: - BNPB	30.000 billion

	warehouses, training centers and emergency operations centers as part of the effort to optimize disaster management resources		Relevant institutions: - MOSA - MOH - MOPW - MOMAF - MOEMR - MOT - BMKG - Basarnas - PMI - Bulog - Ind. Armed Forces - RI National Police	
	1.7 Standardization of disaster management guidelines and references	20 SNI-standardized disaster management guidelines and references formulated	Key institution: - BNPB Relevant institutions: - MORT - BPPT - LIPI - BSN - MOEMR - BMKG	10 billion
	1.8 Coordination of planning and decision making as well as synchronization of policy implementation at the ministries/ agencies level	20 coordination-synchronization events for disaster management policies conducted	Key institution: - CMPW Relevant institutions: - BNPB and all relevant ministries/ agencies	10 billion
	1.9 Coordination of budgeting	20 coordination events for budgeting in disaster management sector conducted	Key institution: - CMPW Relevant institutions: - BNPB and all relevant ministries/ agencies	10 billion
2.	**PROGRAM:** INTEGRATED DISASTER MANAGEMENT PLANNING			
	2.1 Formulation of Disaster Management Plans at the central and local levels	DM Plans formulated in 33 provinces and 275 districts/ cities	Key institution: - BNPB Relevant institutions: - Bappenas	18 billion
	2.2 Mainstreaming of disaster management into development programs	DRR integrated into RPJM, Renstra K/L, RPJMD, Renstra SKPD in 33 provinces and 275 districts/ cities	Key institution: - Bappenas Relevant institutions: - BNPB - MOHA	6,16 billion
3.	**PROGRAM:** RESEARCH, EDUCATION AND TRAINING			
	3.1 Research and development of disaster management science and technology	3,000 research initiatives in 33 Universities all over Indonesia	Key institution: - BNPB Relevant institutions: - MONE	150 billion
	3.2 Improvement of utilization and implementation of science and technology for disaster management including early	Science and technology developed and applied for 14 key hazards	Key institution: - MORT Relevant institutions: - BPPT - LIPI - MONE - MOEMR - MOMAF	128 billion

	warning system		- MOPW - Min. of Forestry - BMKG - BNPB	
3.3	Integration of disaster management science into school curriculums	School curriculum at the central level and regional level contain DM aspects	Key institution: - MONE Relevant institutions: - BNPB	5 billion
3.4	Implementation of disaster preparedness programs at schools	275 disaster-prepared schools in 275 districts/ cities implement preparedness programs	Key institution: - MONE Relevant institutions: - BNPB	5,5 billion
3.5	Enhancement of capacity of the human resources for disaster education	Training for 4,000 teachers and local leaders in 33 provinces	Key institution: - MONE Relevant institutions: - BNPB - MOHA	20 billion
3.6	Information sharing and cross learning among regions and with other countries	5 annual CB-DRR workshops conducted at the national level; international workshops once in two years	Key institution: - BNPB Relevant institutions: - MOFA - MOHA - MOEMR - MOMAF - MOPW - BMKG - MOSA - MOH - Min. of Forestry - MOCI - Ind. Armed Forces - RI National Police - Bakosurtanal - MORT - BPPT - LIPI - Basarnas - PMI	10 billion
3.7	Public education through information dissemination related to disaster	Increased understanding of DM issues in communities in 33 provinces and 275 districts/cities	Key institution: - MOCI Relevant institutions: - BNPB - MOSA - MOHA - MOEMR - MOMAF - MOPW - BMKG - MOH - Min. of Forestry - Ind. Armed Forces - RI National Police - MORT - BPPT - LIPI - Basarnas - PMI	50 billion

4.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	4.1 Formulation of policies to control the ownership and exploitation of natural resources that have the potential to trigger disaster	Government regulations and local regulations on natural resource management that is potentially hazardous formulated in 33 provinces	Key institution: - MOE Relevant institutions: - MOHA - BNPB - MOPW - MOMAF - MOEMR - Min. of Forestry	5 billion
	4.2 Formulation of policies on environmental management that are risk sensitive	Government regulations and local regulations on risk sensitive environmental management formulated	Key institution: - MOE Relevant institutions: - MOHA - BNPB - MOPW - MOMAF - MOEMR - Min. of Forestry	5 billion
	4.3 Monitoring and evaluation of regulations related to environmental/natural resource management that are risk sensitive	Level of compliance to regulations related to risk sensitive environmental/ natural resource management	Key institution: - BNPB Relevant institutions: - RI National Police - AGO - MOLHR - MOE - MOHA - MOPW - MOMAF - MOEMR - Min. of Forestry	5 billion
	4.4 Risk sensitive spatial planning and land use	Risk sensitive spatial and land use planning Risk sensitive spatial planning recommendations for provinces highly prone to hazard	Key institution: - MOPW Relevant institutions: - Bappenas - MOEMR - BPN - BMKG - Bakosurtanal - MOHA - MOMAF - MOA - Min. of Forestry - MOE	140 billion
5.	**PROGRAM:** CAPACITY BUILDING AND IMPROVEMENT OF PEOPLE'S AND STAKEHOLDERS' PARTICIPATION IN DRR			
	5.1 Strengthening of the role of media in nurturing preparedness culture and encouraging community's participation	2,000 journalists at the central level and in 33 provinces trained	Key institution: - MOCI Relevant institutions: - BNPB	10 billion
	5.2 Development of disaster risk reduction forums in the regions	33 disaster risk reduction forums established in 33 provinces	Key institution: - BNPB Relevant institutions: - MOHA	6,6 billion
	5.3 Enhancement of volunteers and stakeholders' participation in DRR	12 Disaster Management volunteer forums established in 12 most hazardous	Key institution: - BNPB Relevant institutions: - MOSA - MOH	5 billion

		provinces	- PMI - National Scout	
	5.2 Development of community-based DRR programs	1,100 disaster prepared villages set up in 33 provinces	Key institution: - BNPB Relevant institutions: - MOSA - MOH - MOEMR - BMKG - MOA - MOMAF - MONE - MOHA - MOCI	110 billion
	5.3 Income diversification for communities and social safety nets for people in hazard prone areas	Micro businesses established for vulnerable communities in 12 most hazardous provinces	Key institution: - MOME Relevant institutions: - MOSA - MOMAF - MOHA - MODDA - MOA	74 billion
	5.4 Development of disaster risk financing mechanism (disaster insurance)	House disaster insurance developed at the central and local levels	Key institution: - BNPB Relevant institutions: - MOPW - Min. of Housing - MOF - Bappenas	2,500 billion
	5.5 Specific risk reduction and preparedness programs for women, children and marginalized groups	Enhanced capacity of women, children and marginal groups in highly hazard prone areas in facing disaster	Key institution: - Min. of Women Empowerment Relevant institutions: - MOSA - BNPB	150 billion
6.	**PROGRAM:** PREPAREDNESS			
	6.1 Strengthening of the national rapid response teams (SRC PB) for the western and eastern regions	Two national SRC PB teams in Jakarta and Malang conduct regular exercises and have their capacity for response enhanced	Key institution: - BNPB Relevant institutions: - Ind. Armed Forces - RI National Police - MOSA	5,000 billion
	6.2 International cooperation in improving preparedness and emergency response	Implementation of AADMER (ASEAN Agreement on DM and Emergency Response)	Key institution: - MOFA Relevant institutions: - BNPB - MOHA	50 billion
	6.3 Development of rapid response teams at the regional office level	12 rapid response teams (SRC PB) established in 12 regional offices	Key institution: - BNPB Relevant institutions: - Ind. Armed Forces - RI National Police - MOSA - MOH - MOPW - Basarnas - MOHA	120 billion

	6.4 Provision and preparation of logistics to meet basic needs in emergency	Logistic stock available for basic needs	Key institution: - MOSA Relevant institutions: - BNPB - MOH - Bulog	300 billion
	6.5 Provision of basic needs for health in emergency	Basic health supplies available for emergency	Key institution: - MOH Relevant institutions: - BNPB - Ind. Armed Forces - RI National Police - PMI	50 billion
	6.6 Provision of materials for emergency and temporary settlements	Materials for emergency and temporary settlements available	Key institution: - MOPW Relevant institutions: - BNPB - MOSA - PMI	150 billion
	6.7 Improvement of accessibility of airports and seaports in hazard prone areas to meet emergency requirements	Airports and seaports in 12 most hazard prone provinces	Key institution: - MOT Relevant institutions: - BNPB - MOPW	1,200 billion
	6.8 Improvement of accessibility of communication and provision of real-time data and information for emergency response, development of disaster IT	Real-time disaster information system established at the national level and in 33 provinces	Key institution: - BNPB Relevant institutions: - MOCI - MOSA - MOHA	100 billion
TOTAL				**41,011.26 billion**

Annex 4.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Earthquake Hazard

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Hazard mapping, disaster risk mapping, and monitoring of earthquake	- earthquake disaster risk map with scale of 1 : 50.000 - Installment of 400 strong motion accelographs throughout all over Indonesia	Key institution: - BMKG - MOEMR - LIPI Relevant institutions: - Bakosurtanal - BPPT - MOPW - BNPB - BPS - LAPAN	400 billion
	2. Implementation of structural and non-structural mitigation efforts	- 23 provinces highly prone to earthquake hazard - Extension and training programs for disaster risk reduction mechanism	Key institution: - BMKG - BNPB Relevant institutions: - MOPW - MOEMR - LIPI - Bakosurtanal - BPPT - MOSA - MOH - MONE	1,150 billion
	3. Research and development	- 100 research and dev. initiatives on earthquake disaster risk reduction annually - Establishment of national board for earthquake disaster prevention	Key institution: - LIPI Relevant institutions: - BMKG - MOEMR - BPPT - Bakosurtanal - LAPAN - MORT - MOSA - MOH - MOHA MONE	150 billion
2.	**PROGRAM:** PREPAREDNESS			
	1. Formulation of contingency plan	23 contingency plans in provinces highly prone to earthquake	Key institution: - BNPB Relevant institutions: - BMKG - MOEMR - MOHA LIPI - MOSA - MOH - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces/POLRI	11,5 billion
	2. Enhancement of emergency response mechanism extension, training and simulation	- 200 extension and training programs for areas highly prone to earthquake - 50 preparedness simulations to earthquake for areas highly prone to earthquake	Key institution: - BNPB Relevant institutions: - BMKG - MOEMR - MOHA - LIPI - MOSA - MOH - Bakosurtanal - LAPAN	85 billion

			- BPPT - Ind. Armed Forces - POLRI	
3.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Disaster rapid assessment		SRC-PB	10 billion
	2. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOSA - MOH - MOT - MOPW	12,5 billion
	3. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW	20 billion
	4. Recovery of vital facilities-infrastructure and utilities		Key institution: - MOPW Relevant institutions: - Ind. Armed Forces - RI National Police - Basarnas - MOHA - MOSA - MOH - MOT - MOE MR	10 billion
	5. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - MOSA - MOH - BMKG	50 billion
4.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Rehabilitation and reconstruction of public facilities and infrastructures in post-disaster areas that have not been completed	Completion of rehabilitation and reconstruction of post earthquake West Java and West Sumatra	- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	8,000 billion (estimation)
	2. Identification and verification of damage and loss		- BNPB, Bappenas - MOHA - MOF - MOPW - MOSA - MOH	10 billion
	3. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas, - MOHA - MOF - MOPW - MOSA - MOH	10 billion

4. Recovery of public facilities and infrastructure and reconstruction of disaster survivors' houses		- MOPW - BNPB - Min. of Housing - MOH - MONE - MOCT - MORA	2,500 billion
5. Health and psychological condition recovery		- MOSA - MOH	20 billion
6. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - BMKG	50 billion
TOTAL			**12,489 billion**

Annex 5.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Tsunami Hazard

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Hazard mapping, disaster risk mapping, and monitoring of tsunami	- Tsunami disaster risk map with a scale of 1: 50.000 - Installment of 25 tsunami buoys in all over Indonesia	Key institution: - BMKG - MOEMR - MOMAF Relevant institutions: - LIPI - Bakosurtanal - BPPT - MOPW - BNPB	310 billion
	2. Implementation of structural and non-structural mitigation efforts	25 provinces highly prone to tsunami hazard	Key institution: Non structural: - MOEMR Structural: - MOPW Relevant institutions: - BMKG - MOMAF - LIPI - BPPT - MORT - BNPB - MOSA - MOH	625 billion
	3. Research and development	100 research and development initiatives on tsunami disaster risk reduction annually	Key institution: - MORT - LIPI - MOMAF - BMKG Relevant institutions: - MOEMR - BPPT - Bakosurtanal - LAPAN - MOSA - MOH - MOHA - MONE	50 billion
2.	**PROGRAM:** PREPAREDNESS			
	1. Formulation of contingency plan	25 contingency plans in provinces highly prone to tsunami	Key institution: - BNPB Relevant institutions: - BMKG - MOEMR - MOHA - LIPI - MOSA - MOH - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	50 billion
	2. Emergency response mechanism extension, training and simulation	- 100 extension and training programs for areas highly prone to tsunami - 25 preparedness simulations to tsunami for areas	Key institution: - BNPB Relevant institutions: - BMKG - MOEMR - MOHA - LIPI	42,5 billion

		highly prone to tsunami	- MOSA - MOH - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	
3.	**PROGRAM:** EARLY WARNING SYSTEM			
	1. Tsunami early warning system	Establishment of early warning system 25 provinces highly prone to tsunami	Key institution: - BMKG - MORT Relevant institutions: - MOMAF - MOEMR - MOHA - LIPI - MOSA - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police - MOH	237,5 billion
4.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Disaster rapid assessment tsunami		BNPB SRC-PB	10 billion
	2. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - PMI - MOH	12,5 billion
	3. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution for food and clothing: - MOSA Key institution for settlement, clean water, sanitation: - MOPW Key institution for health service: - MOH Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOT	20 billion
	4 Recovery of vital facilities-infrastructure and utilities		Key institution: - MOPW Relevant institutions: - Ind. Armed Forces - RI National Police - Basarnas - MOHA - MOSA - MOH - MOT - MOCI	10 billion
	5. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - BMKG	50 billion

5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	10 bilion
	2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	10 bilion
	3. Recovery of public facilities and infrastructure and reconstruction of disaster survivors' houses		- MOPW - BNPB - Min. of Housing	2,500 billion
	4. Health and psychological condition recovery		- MOSA - MOH	20 bilion
	5. Enhancement of rehabilitation and reconstruction capacitythrough education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - BMKG	50 bilion
	TOTAL			**4,008.5 billion**

Annex 6.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Eruption Hazard

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Hazard mapping, disaster risk mapping, and monitoring of volcano	- Volcanic eruption disaster risk map with a scale of 1: 50.000 - Installment of instruments to monitor volcanic activities at 70 volcanoes	Key institution: - MOEMR Relevant institutions: - MOHA - Bakosurtanal - BPPT - LAPAN - BMKG - BNPB	56 billion
	2. Implementation of structural and non-structural mitigation efforts	In 70 areas highly prone to volcanic eruption hazard	Key institution: - MOEMR - MOPW - Min. of Forestry Relevant institutions: - LIPI - BPPT - MOH - MOSA - MOE	245 billion
	3. Research and development	40 research and development initiatives on volcanic eruption disaster risk reduction annually	Key institution: - MOEMR Relevant institutions: - MORT - BMKG - MOEMR - BPPT - Bakosurtanal - LAPAN - LIPI - MOH - MOSA - MOHA - MONE	60 billion
2.	**PROGRAM:** EARLY WARNING SYSTEM			
	1. Volcanic activity monitoring and early warning system	Establishment of volcanic activity monitoring and early warning system in 70 volcanoes	Key institution: - MOEMR Relevant institutions: - BMKG - BNPB - MOHA - MOH - MOSA - Ind. Armed Forces - RI National Police	210 billion
3.	**PROGRAM:** PREPAREDNESS			
	1. Formulation of contingency plan	70 contingency plans in provinces highly prone to volcanic hazard	Key institution: - BNPB Relevant institutions: - MOEMR - BMKG - MOHA - LIPI - MOH - MOSA - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	35 billion

	2. Emergency response mechanism extension, training and simulation	- 30 extension and training programs for areas highly prone to volcanic hazard - 30 preparedness simulations to volcanic eruption for areas highly prone to volcanic hazard	Key institution: - BNPB Relevant institutions: - ESDM - BMKG - MOHA - LIPI - MOH - MOSA - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	37,5 billion
4.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Disaster rapid assessment for volcanic eruption		SRC-PB	7,5 billion
	2. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - MOH - MOSA - MOT - MOPW	10 billion
	3. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW	20 billion
	4. Recovery of vital facilities-infrastructure and utilities		Key institution: - MOPW Relevant institutions: - Ind. Armed Forces - RI National Police - Basarnas - MOHA - MOSA - MOH - MOT	10 billion
	5. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOEMR - BMKG	50 billion
5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Rehabilitation and reconstruction of public facilities and infrastructures in post-disaster areas that have not been completed		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - MOEMR	-

1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - MOEMR	10 billion
2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - MOEMR	10 billion
3. Recovery of public facilities and infrastructure and reconstruction of disaster survivors' houses		- MOPW - BNPB - Min. of Housing	100 billion
4. Health and psychological condition recovery		- MOSA - MOH	20 billion
5. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOEMR - BMKG	50 billion
TOTAL			**931 billion**

Annex 7.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Land Mass Movement Hazard

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Land mass movement hazard mapping and risk mapping	Land mass movement disaster risk maps with a scale of 1:50.000	Key institution: - MOEMR - BMKG Relevant institutions: - LIPI - Bakosurtanal - BPPT - MOPW - BNPB - LAPAN	180 billion
	2. Implementation of structural and non-structural mitigation efforts	26 provinces highly prone to land mass movement hazard	Key institution: - MOEMR Relevant institutions: - MOPW - LIPI - BPPT - BNPB - MOSA - MOH	260 billion
	3. Research and development	- 100 research and development initiatives on land mass movement disaster risk reduction annually	Key institution: - MOEMR - LIPI Relevant institutions: - BMKG - MOPW - MORT - BPPT - Bakosurtanal - LAPAN - MOSA - MOH - MOHA - MONE - MOT	50 billion
2.	**PROGRAM:** EARLY WARNING SYSTEM			
	1. Monitoring of land mass movement in vital and strategic road networks and areas	Establishment of early warning system 26 provinces highly prone to land mass movement	Key institution: - BMKG - MOPW - MOEMR Relevant institutions: - BNPB - MORT - MOMAF - MOHA - LIPI - MOSA - MOH - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	200 billion
3	**PROGRAM:** PREPAREDNESS			
	1. Formulation of contingency plan	26 contingency plans in provinces highly prone to land mass movement	Key institution: - BNPB Relevant institutions: - MOEMR - BMKG - MOPW	13 billion

5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Rehabilitation and reconstruction of public facilities and infrastructures in post-disaster areas that have not been completed		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - MOEMR	25 billion
	2. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - MOEMR	10 billion
	3. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - MOEMR	10 billion
	4. Recovery of public facilities and infrastructure and reconstruction of disaster survivors' houses		- MOPW - BNPB - Min. of Housing	150 billion
	5. Health and psychological condition recovery		- MOSA - MOH	20 billion
	6. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOEMR - BMKG	50 billion
TOTAL				**1,111.6 billion**

Annex 8.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Flood Hazard

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Flood hazard and risk mapping	Flood disaster risk map with a scale of 1:50.000	Key institution: - MOPW - BMKG - Bakosurtanal Relevant institutions: - BPPT - LAPAN	200 billion
	2. Implementation of structural and non-structural mitigation efforts	30 provinces highly prone to flood	Key institution: - MOPW Relevant institutions: - BMKG - LIPI - BPPT - BNPB - MOSA - MOH	1,500 billion
	3. Research and development	100 research and development initiatives on flood disaster risk reduction annually	Key institution: - BPPT Relevant institutions: - BMKG - MOPW - MOEMR - Bakosurtanal - LAPAN - LIPI - MOH - MOHA - MONE	50 billion
2.	**PROGRAM:** EARLY WARNING SYSTEM			
	1. Establishment of flood early warning system	Establishment of early warning system in 30 provinces highly prone to flood	Key institution: - MOPW Relevant institutions: - BNPB - BMKG - MORT - MOMAF - MOEMR - MOHA - LIPI - MOSA - MOH - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	90 billion
3.	**PROGRAM:** PREPAREDNESS			
	1. Formulation of contingency plan	30 contingency plans in provinces highly prone to flood	Key institution: - BNPB Relevant institutions: - BMKG - MOPW - MOHA - LIPI - MOSA - MOH - Ind. Armed Forces - RI National Police	15 billion

	2. Emergency response mechanism extension, training and simulation	- 100 extension and training programs for areas highly prone to flood - 25 flood preparedness simulations for areas highly prone to flood	Key institution: - BNPB Relevant institutions: - BMKG - MOEMR - MOHA - LIPI - MOSA - MOH - Bakosurtanal - LAPAN - BPPT - MOCI - Ind. Armed Forces - RI National Police	42,5 billion
4.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Flood disaster rapid assessment		SRC-PB	7,5 billion
	2. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - MOH - MOSA - MOT - MOPW - MOHA	10 billion
	3. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW	20 billion
	4. Recovery of vital facilities-infrastructure and utilities		Key institution: - MOPW Relevant institutions: - Ind. Armed Forces - RI National Police - Basarnas - MOHA - MOSA - MOH - MOT	10 billion
	5. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - Bakosurtanal	50 billion
5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	10 billion
	1. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	10 billion

	1. Recovery of public facilities and infrastructure and reconstruction of disaster survivors' houses		- MOPW - BNPB - Min. of Housing - MOHA	75 billion
	2. Health and psychological condition recovery		- MOSA - MOH	10 billion
	3. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - Bakosurtanal	50 billion
		TOTAL		**2,150 billion**

Annex 9.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Drought Hazard

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM :** DISASTER PREVENTION AND MITIGATION			
	1. Analysis and monitoring of drought hazard	Drought disaster risk map	Key institution: - BMKG - MOPW - MOA - LAPAN Relevant institutions : - MOEMR - LIPI - Bakosurtanal - BPPT - BNPB - Min. of Forestry - MOSA - MOH	5,5 billion
	2. Implementation of structural and non-structural mitigation efforts	24 provinces highly prone to drought	Key institution: - MOPW - MOA - BMKG - Min. of Forestry Relevant institutions: - MOEMR - LIPI - BPPT - BNPB - MOSA - MOH	240 billion
	3. Research and development	50 research and development initiatives on drought disaster risk reduction annually	Key institution: - LIPI - BMKG Relevant institutions: - MOEMR - BPPT - Bakosurtanal - LAPAN - MORT - MOSA - MOH - MOA - Min. of Forestry - MOHA - MONE	25 billion
2	**PROGRAM :** EARLY WARNING SYSTEM			
	1. Information and extension	- 50 extension and training programs for areas highly prone to drought	Key institution: - BMKG - MOA - LAPAN - Min. of Forestry Relevant institutions: - BNPB - MOEMR - MOHA - LIPI - MOSA - MOH - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	7,5 billion

3.	**PROGRAM:** PREPAREDNESS			
	1. Formulation of contingency plan for drought	24 contingency plans in provinces highly prone to drought	Key institution: - BNPB - MOSA - MOH - Min. of Forestry - MOA Relevant institutions: - BMKG - MOEMR - MOHA - LIPI - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	7,2 billion
4.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW	20 billion
	2. Recovery of vital facilities-infrastructure and utilities		Key institution: - MOPW - Min. of Forestry - MOA Relevant institutions: - MOHA - MOSA - MOH - MOT	15 billion
	3. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - BMKG - MOA	30 billion
5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	10 billion
	2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - Min. of Forestry - MOA - MOE	10 billion
	3. Recovery of public facilities and infrastructure		- MOPW - BNPB - Min. of Forestry - MOA - MOE	250 billion

	1. Enhancement of rehabilitation and reconstruction capacitythrough education-training, development of system and infrastructure and provision ofsufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - BMKG - MOA	30 billion
TOTAL				**650,2 billion**

Annex 10.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Forest and Land Fire

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Mapping and monitoring of forest and land fires	- SPBK (fire hazard ranking system) with a scale of 1:50.000 - Fire patrol and watch through the air and land	Key institution: - MOA - Min. of Forestry - MOE - Ind. Armed Forces - RI National Police Relevant institutions: - BNPB - BMKG - LIPI - Bakosurtanal - BPPT - LAPAN	50 billion
	2. Implementation of structural and non-structural mitigation efforts	- In 10 provinces highly prone to forest and land fire in one year - Enhanced monitoring of peat land management to prevent burning - Facilitation of non-burning land for traditional farmers	Key institution: - MOA - Min. of Forestry Relevant institutions: - MOPW - MOHA - BMKG - BNPB - LAPAN	100 billion
	3. Research and development	- 50 research and development initiatives on forest and land fire risk reduction on a yearly basis - Utilization of materials that are often burned	Key institution: - MOA - Min. of Forestry Relevant institutions: - BMKG - LAPAN - BPPT - Bakosurtanal - LAPAN - LIPI	26 billion
	4. Implementation of ASEAN Agreement on Trans-boundary Haze Pollution (AATHP)	Synchronization of efforts to prevent and mitigate trans-boundary haze hazard across ASEAN countries	Key institution: - MOFA Relevant institutions: - MOE - Min. of Forestry - MOA - BNPB	50 billion
2.	**PROGRAM:** EARLY WARNING SYSTEM			
	1. Development of early warning system for forest and land fire	Forest and land fire early warning system set up in 10 provinces highly prone to forest and land fire	Key institution: - MOA - Min. of Forestry Relevant institutions: - BNPB - MOHA - LIPI - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	30 billion
3.	**PROGRAM:** PREPAREDNESS			
	1. Formulation of contingency plan	10 contingency plans formulated in 10 provinces highly prone to forest and land fire	Key institution: - BNPB Relevant institutions: - MOA - Min. of Forestry - BMKG	5 billion

			- MOHA - LIPI - MOSA - MOH - MOT - LAPAN - BPPT - Ind. Armed Forces - RI National Police	
	2. Enhancement of emergency response mechanism extension, training and simulation	- 50 extension and training programs for areas highly prone to forest and land fire - 10 preparedness simulations for areas highly prone to forest and land fire	Key institution: - BNPB - MOA - Min. of Forestry Relevant institutions: - BMKG - MOHA - MOSA - MOH - Bakosurtanal - LAPAN - BPPT - Ind. Armed Forces - RI National Police	18.5 billion
4.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Fire fighting operations	- Resource mobilization through land, air and water - Weather modification (artificial rain)	Key institution: - BNPB - Min. of Forestry - MOE Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOSA - MOPW - MOT - BPPT	25 billion
	2. Patrol, Search, rescue and evacuation	Evacuation of people, animal and strategic assets	Key institution: - Basarnas - Min. of Forestry Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOSA - MOH - MOT - MOPW	10 billion
	3. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs	Collection and distribution of aid	Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW - MOA - Min. of Forestry	10 billion
	4. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - MOA - Min. of Forestry	40 billion

5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Assessment and verification of damage and loss		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH - Min. of Forestry - MOA	10 billion
	2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - Min. of Forestry - MOA - MOE	10 billion
	3. Recovery of public facilities and infrastructure and reforestation		- MOPW - BNPB - Min. of Forestry - MOA - MOE	50 billion
	4. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - BMKG - MOA - Min. of Forestry	40 billion
TOTAL				**474,5 billion**

Annex 11.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Erozion

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Assessment and monitoring of erosion hazard	Erosion disaster risk maps	Key institution: - MOPW Relevant institutions: - MOA - Min. of Forestry - Bakosurtanal - MOE	40 billion
	2. Implementation of structural and non-structural mitigation efforts	23 provinces highly prone to erosion hazard annually	Key institution: - MOPW Relevant institutions: - MOA - Min. of Forestry - MOE	230 billion
	3. Research and development	15 research and development initiatives on erosion risk reduction annually	Key institution: - MOPW Relevant institutions: - BPPT - LIPI - LAPAN - Bakosurtanal - MOA - Min. of Forestry - MOE - MOEMR	15 billion
2.	**PROGRAM:** PREPAREDNESS			
	Emergency response mechanism extension, training and simulation	20 extension and training programs for areas highly prone to erosion	Key institution: - BNPB Relevant institutions: - MOHA - Min. of Forestry - MOA - MOE	3 billion
3.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOSA - MOH - MOT - MOPW	1,5 billion
	2. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW	2 billion
	3. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - MOA - Min. of Forestry - MOMAF	30 billion

4.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOE - Min. of Forestry - MOA	1,5 billion
	2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - Min. of Forestry - MOA - MOE	2,5 billion
	3. Recovery of public facilities and infrastructure	-	- MOHA - MOPW - Min. of Forestry - MOA - MOE	25 billion
	4. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - BMKG - MOA - Min. of Forestry - MOMAF	30 billion
	TOTAL			**380,5 billion**

Annex 12.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Building and House Fire

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM**: DISASTER PREVENTION AND MITIGATION			
	1. Building and house fire risk assessment and mapping	building and house fire disaster riskmaps	Key institution: - MOHA Relevant institutions: - MOPW - Min. of Housing - Bakosurtanal - MOE	20 billion
	2. Implementation of structural and non-structural mitigation efforts	In 25 provinces highly prone to building and house fire annually	Key institution: - MOHA Relevant institutions: - MOPW - Min. of Housing	125 billion
	3. Research and development	25 research and development initiatives on building and house fire risk reduction annually	Key institution: - MOPW Relevant institutions: - BPPT - LIPI - Min. of Housing	12,5 billion
2.	**PROGRAM**: PREPAREDNESS			
	1. Formulation of contingency plan	10 contingency plans formulated in provinces highly prone to building and house fire	Key institution: - BNPB Relevant institutions: - MOHA - MOSA - MOH - MOT - Ind. Armed Forces - RI National Police - Basarnas - Min. of Housing	5 billion
	2. Emergency response mechanism extension, training and simulation	- 30 extension and training programs for areas highly prone to building and house fire - 5 simulation exercises for areas highly prone to building and house fire	Key institution: - BNPB Relevant institutions: - MOHA - MOSA - MOH - Ind. Armed Forces - RI National Police - Basarnas	10 billion
3.	**PROGRAM**: EMERGENCY RESPONSE			
	1. Fire fighting operations		Key institution: - MOHA Relevant institutions: - Ind. Armed Forces - RI National Police - MOSA - MOPW - MOT - Basarnas	10 billion
	2. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces/POLRI - MOHA - MOSA - MOH - MOT - MOPW	5 billion

	1. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - BMKG	30 billion
4.	**PROGRAM**: REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - Min. of Housing	2,5 billion
	2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - Min. of Housing - MOSA - MOH	2,5 billion
	3. Recovery of public facilities and infrastructure		- MOHA - MOPW - BNPB - Min. of Housing	50 billion
	4. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG	30 billion
	TOTAL			**312,5 billion**

Annex 13.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Waves and Abration

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Extreme waves and abrasion risk assessment and mapping	Extreme waves and abrasion riskmaps formulated	Key institution: - MOMAF - MOPW - BMKG Relevant institutions: - LAPAN - Bakosurtanal - LIPI - BPPT - MOE	5 billion
	2. Implementation of structural and non-structural mitigation efforts	12 provinces highly prone to extreme waves and abrasion	Key institution: - MOMAF - MOPW - BMKG - LAPAN Relevant institutions: - BPPT - LIPI - Bakosurtanal - MOE - BMKG	90 billion
	3. Research and development	25 research and development initiatives related to extreme waves and abrasion annually	Key institution: - BMKG - LAPAN Relevant institutions: - BPPT - LIPI - Bakosurtanal - MOE - BMKG - MOMAF	12,5 billion
2	**PROGRAM:** EARLY WARNING SYSTEM			
	Monitoring and extension	12 provinces highly prone to extreme waves and abrasion	Key institution: - MOMAF - MOPW - BMKG - LAPAN Relevant institutions: - BPPT - LIPI - Bakosurtanal - MOE - BMKG	12 billion
3..	**PROGRAM:** PREPAREDNESS			
	Extension and training	20 extension and training programs for areas highly prone to extreme waves and abrasion	Key institution: - BNPB Relevant institutions: - MOMAF - BMKG - MOPW - MOE - MOMAF	3 billion
4.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Search, rescue and evacuation		Key institution: - BNPB - Basarnas - Ind. Armed Forces	10 billion

			- RI National Police Relevant institutions: - MOHA - MOSA - MOH - MOT - MOPW	
	2. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA - MOH - MOPW Relevant institutions: - MOHA - MOT	20 billion
	3. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - MOMAF	30 billion
5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOMAF - MOE	1,5 billion
	2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - MOMAF - MOE	2,5 billion
	3. Recovery of public facilities and infrastructure and reforestation		- MOHA - MOPW - MOMAF - MOE	25 billion
	4. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - MOMAF	30 billion
	TOTAL			**241,5 billion**

Annex 14.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Extreme Wether

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MINAGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM:** DISASTER PREVENTION AND MITIGATION			
	1. Extreme weather risk assessment and mapping	Extreme Weather disaster risk maps	Key institution: - BMKG - LAPAN Relevant institutions: - Bakosurtanal - MOPW - LIPI - BPPT - MOE	5 billion
	2. Implementation of structural and non-structural mitigation efforts	- 14 provinces highly prone to extreme weather annually	Key institution: - MOPW - BNPB - BMKG Relevant institutions: - MOHA - MOT - MOE	35 billion
	3. Research and development	20 research and development initiatives related to extreme weather risk reduction annually	Key institution: - BMKG - LAPAN Relevant institutions: - BPPT - LIPI - Bakosurtanal - MOPW - MOE	10 billion
2	**PROGRAM:** EARLY WARNING SYSTEM			
	Monitoring and extension	Monitoring and extension in 14 provinces	Key institution: - BMKG - LAPAN Relevant institutions: - MOPW - MOE	35 billion
2.	**PROGRAM:** PREPAREDNESS			
	Emergency response mechanism extension, training and simulation	20 extension and training programs for areas highly prone to extreme weather	Key institution: - BNPB - BMKG - LAPAN Relevant institutions: - MOMAF - MOPW - MOE	3 billion
4.	**PROGRAM:** EMERGENCY RESPONSE			
	1. Search, rescue and evacuation		Key institution: - BNPB - Basarnas - Ind. Armed Forces - RI National Police Relevant institutions: - MOHA - MOSA - MOH - MOT - MOPW	10 billion
	2. Fulfillment of basic food, clothing, temporary settlement,		Key institution: - MOSA - MOH	10 billion

	health, clean water and sanitation needs		- MOPW Relevant institutions: - MOHA - MOT	
	3. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of budget		- BNPB - MOHA - MOF - MOPW - BMKG - LAPAN - BPPT	30 billion
5.	**PROGRAM:** REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - MOE	1,5 billion
	2. Formulation of rehabilitation and reconstruction plans		- BNPB - Bappenas - MOHA - MOF - MOPW - BMKG - MOE	2,5 billion
	3. Recovery of public facilities and infrastructure		- MOHA - MOPW - MOE	25 billion
	4. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - BMKG - LAPAN - BPPT	30 billion
		TOTAL		**197 billion**

Annex 15.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget forTechnological Failure

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM**: DISASTER PREVENTION AND MITIGATION			
	1. Technological failure risk assessment and mapping	Technological failure disaster risk maps	Key institution: - BPPT - MOI - MOT Relevant institutions: - MOPW - MOHA - Bakosurtanal - LIPI - Bapeten - BATAN - MOE - MONE	10 billion
	2. Implementation of structural and non-structural mitigation efforts	Areas highly prone to technological failure annually	Key institution: - MOHA - MOI - MOT Relevant institutions: - MOPW - BPPT - LIPI - Bapeten - BATAN	7,5 billion
	3. Research and development	10 research and development initiatives on technological failure risk reduction annually	Key institution: - BPPT Relevant institutions: - MOPW - MOI - MOT - LIPI - MOE - Bapeten - BATAN	5 billion
2.	**PROGRAM**: PREPAREDNESS			
	Emergency response mechanism extension, training and simulation	- 10 extension and training programs for areas highly prone to technological failure	Key institution: - BNPB Relevant institutions: - MOHA - BPPT - LIPI - MOI - MOT - MOPW - Ind. Armed Forces - RI National Police - Basarnas - BATAN - Bapeten	1,5 billion
3.	**PROGRAM**: EMERGENCY RESPONSE			
	1. Emergency operations		Key institution: - MOHA Relevant institutions: - Ind. Armed Forces - RI National Police - MOSA - MOI - MOPW - MOT	10 billion

			- Basarnas - BATAN - Bapeten	
	2. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOSA - MOH - MOT - MOPW	5 billion
	3. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW	10 billion
	4. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - MOI - LAPAN - LIPI - BPPT - MOT - BATAN - Bapeten	30 billion
4.	**PROGRAM**: REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	2,5 billion
	2. Recovery of public facilities and infrastructure		- MOHA - MOPW - BNPB	50 billion
	3. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas, - MOHA - MOF - MOPW - MOI - LAPAN - LIPI - BPPT - MOT	30 billion
TOTAL				**161,5 billion**

Annex 16.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Epidemics and Diseases

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET
1.	**PROGRAM**: DISASTER PREVENTION AND MITIGATION			
	1. Epidemics and diseases risk assessment and mapping	Epidemics and diseases disaster risk map	Key institution: - MOH Relevant institutions: - MOHA - Bakosurtanal - BPPT - LIPI - LAPAN - MOPW	8 billion
	2. Implementation of structural and non-structural mitigation efforts	Areas highly prone to epidemics and diseases	Key institution: - MOH Relevant institutions: - MOPW - MOE	50 billion
	3. Research and development	20 research and development initiatives related to epidemics and diseases risk reduction annually	Key institution: - MOH Relevant institutions: - MOHA - MONE	30 billion
2.	**PROGRAM**: PREPAREDNESS			
	1. Formulation of contingency plan	5 contingency plans in provinces highly prone to epidemics and diseases	Key institution: - MOH - BNPB Relevant institutions: - MOHA - MOSA	2,5 billion
	2. Emergency response mechanism extension, training and simulation	- 30 extension and training programs for areas highly prone to epidemics and diseases - 5 simulations for areas highly prone to epidemics and diseases	Key institution: - BNPB Relevant institutions: - MOHA - MOSA - MOH	10 billion
3.	**PROGRAM** : EMERGENCY RESPONSE			
	1. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOSA - MOH - MOT - MOPW	10 billion
	2. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOPW	20 billion
	3. Enhancement of emergency response capacity through education-training, development of system and infrastructure and provision of sufficient		- BNPB - Bappenas - MOH - MOF - MOPW - MOI - LAPAN - LIPI	30 billion

	budget		- BPPT - MOT - MOHA - Bakosurtanal	
4.	**PROGRAM**: REHABILITATION AND RECONSTRUCTION			
	1. Health and psychological condition recovery		- MOSA - MOH	20 billion
	2. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOH - MOF - MOPW - MOI - LAPAN - LIPI - BPPT - MOT - MOHA - Bakosurtanal	30 billion
	TOTAL			**210,5 billion**

Annex 17.

Matrix of Program, Priority Focus, Target, Involvement of Ministries/Agencies and Indicative Budget for Social Conflict

NO.	PRIORITY FOCUS	TARGET	INVOLVEMENT OF MIN/AGE	INDICATIVE BUDGET (RUPIAH)
1.	**PROGRAM**: DISASTER PREVENTION AND MITIGATION			
	1. Social conflict risk assessment and mapping	Social conflict disaster risk maps	Key institution: - MOSA Relevant institutions: - Ind. Armed Forces - RI National Police - MOCI - MOHA	5 billion
	2. Implementation of structural and non-structural mitigation efforts	Areas highly prone to social conflict annually	Key institution: - MOSA Relevant institutions: - Ind. Armed Forces - RI National Police - MOCI - MOHA	7,5 billion
	3. Research and development	10 research and development initiatives on social conflict risk reduction annually	Key institution: - MOSA Relevant institutions: - LIPI - MOHA	5 billion
2.	**PROGRAM**: PREPAREDNESS			
	1. Emergency response mechanism extension, training and simulation	10 extension and training programs for areas highly prone to social conflict	Key institution: - BNPB Relevant institutions: - MOSA - MOHA - Ind. Armed Forces - RI National Police - LIPI	1,5 billion
3.	**PROGRAM**: EMERGENCY RESPONSE			
	1. Emergency Operations		Key institution: - MOHA Relevant institutions: - Ind. Armed Forces/POLRI - MOSA - MOI - MOPW - MOT - Basarnas	10 billion
	2. Search, rescue and evacuation		Key institution: - Basarnas Relevant institutions: - Ind. Armed Forces - RI National Police - MOHA - MOSA - MOH - MOT - MOPW	5 billion
	3. Fulfillment of basic food, clothing, temporary settlement, health, clean water and sanitation needs		Key institution: - MOSA Relevant institutions: - MOH - MOHA - MOT - MOPW	10 billion
	4. Enhancement of emergency response capacity		- BNPB - Bappenas - MOSA	30 billion

	through education-training, development of system and infrastructure and provision of sufficient budget		- MOF - LIPI - Ind. Armed Forces - RI National Police - MOCI - MOHA	
4.	**PROGRAM**: REHABILITATION AND RECONSTRUCTION			
	1. Damage and loss assessment		- BNPB - Bappenas - MOHA - MOF - MOPW - MOSA - MOH	2,5 billion
	2. Recovery of public facilities and infrastructure		- BNPB - MOHA - MOPW	50 billion
	3. Enhancement of rehabilitation and reconstruction capacity through education-training, development of system and infrastructure and provision of sufficient budget		- BNPB - Bappenas - MOSA - MOF - LIPI - Ind. Armed Forces - RI National Police - MOCI - MOHA	30 billion
	TOTAL			**156,5 billion**

Annex 18.

List of Abbreviations and Acronyms

Bakosurtanal	Agency for the Coordination of National Survey and Mapping
Bapeten	Nuclear Energy Regulatory Agency
Bappenas	National Development Planning Board
Basarnas	Indonesian National Search and Rescue
BATAN	National Nuclear Agency
BMKG	Agency for Meteorology, Climatology and Geophysics
BNPB	National Agency for Disaster Management
BPBD	Local Disaster Management Agency
BPN	National Land Agency
BPPT	Agency for the Development and Implementation of Technology
BPS	Statistics Indonesia
BSN	National Standardization Agency
Bulog	National Logistics Agency
CDE	Consortium for Disaster Education
CMPW	Coordinating Ministry for People's Welfare
DIBI	Disaster Data and Information
GDP	Gross Domestic Product
K/L	Government Ministries/Agencies
KLB	Extraordinary Events
KRB	Hazard prone areas
LAPAN	National Aviation and Aeronautics Agency
LIPI	Indonesian Science Institute
MOA	Ministry of Agriculture
MOCI	Ministry of Communication and Informatics
MOCMB	Ministry of Cooperatives and Micro Businesses
MOD	Ministry of Defense

MODDA	Ministry of Development of Disadvantaged Areas
MOE	Ministry of Environment
MOEMR	Ministry of Energy and Mineral Resources
MOF	Ministry of Finance
MOFA	Ministry of Foreign Affairs
MOH	Ministry of Health
MOHA	Ministry of Home Affairs
MOI	Ministry of Industry
MOLHR	Ministry of Law and Human Rights
MOMAF	Ministry of Marine Affairs and Fishery
MOMT	Ministry of Manpower and Transmigration
MONDP	Ministry of National Development Planning
MONE	Ministry of National Education
MOPW	Ministry of Public Works
MORA	Ministry of Religious Affairs
MORT	Ministry of Research and Technology
MOSA	Ministry of Social Affairs
MOT	Ministry of Transportation
NGO	Non-Governmental Organization
Perka	Chief (of BNPB) regulation
Permendagri	Ministry of Home Affairs Regulation
Planas PRB	National Platform for Disaster Risk Reduction
PMI	Indonesian Red Cross
Polri	National Police of the Republic of Indonesia
PRB	Disaster Risk Reduction
PVMBG	Center for Vulcanology and Mitigation of Geological Hazards
RAN PRB	National Action Plan for Disaster Risk Reduction
Renas PB	National Disaster Management Plan

Renja	Work Plan
Renstra	Strategic Plan
RKP	Government Work Plan
RKPD	Local Government Work Plan
RPJM	Middle-term Development Plan
RPJMD	Local Middle-term Development Plan
SKPD	Local Government Unit
SOP	Standard Operating Procedure
SRC PB	Disaster Management Rapid Response Team
TNI	Indonesia National Armed Forces
UU	Law