ASIAN DISASTER REDUCTION CENTER
Visiting Researcher Program FY2012B

Comparative study on Disaster Risk Reduction to build the resilience of Nations

Final Report Paper

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CHAPTER 1.

OVERVIEW OF DISASTER SITUATION IN THE WORLD, INDONESIA AND JAPAN

1.1. *N*atural and human-made disasters trend in the world

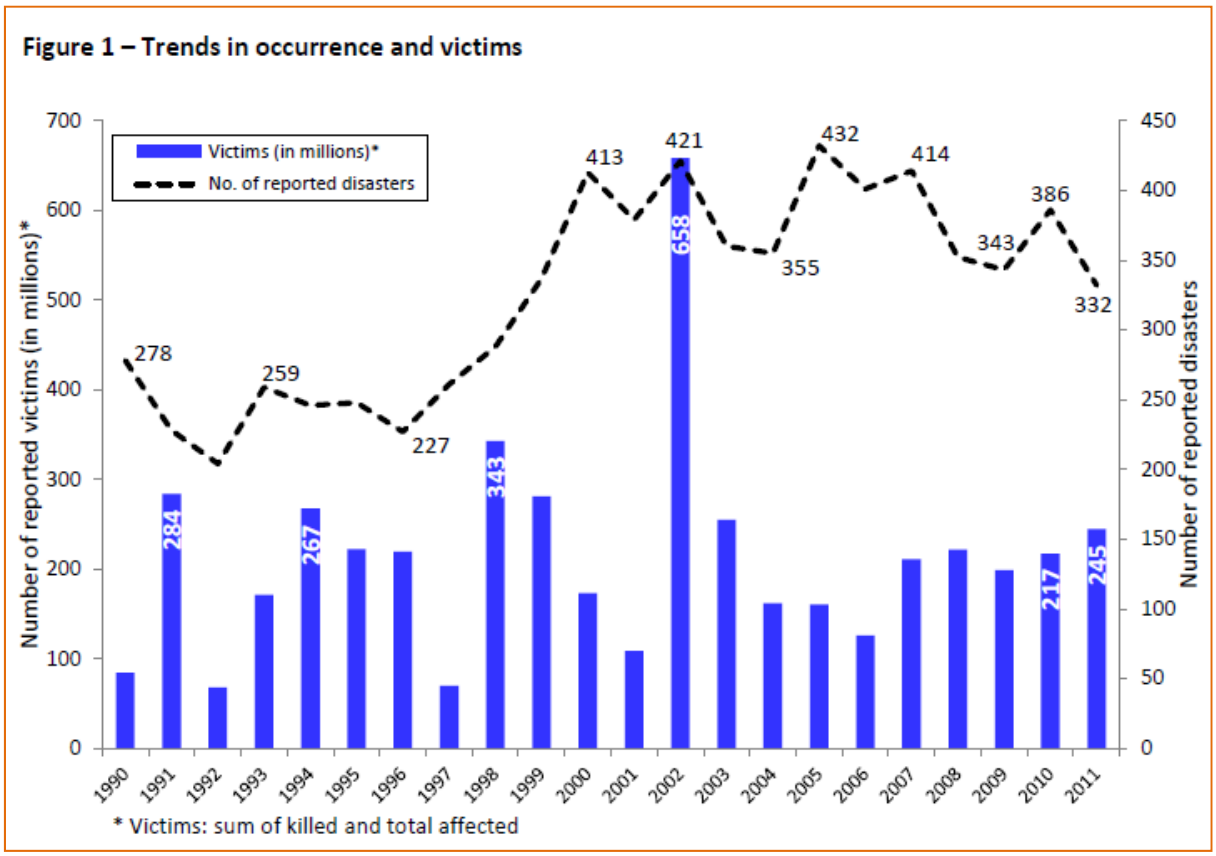
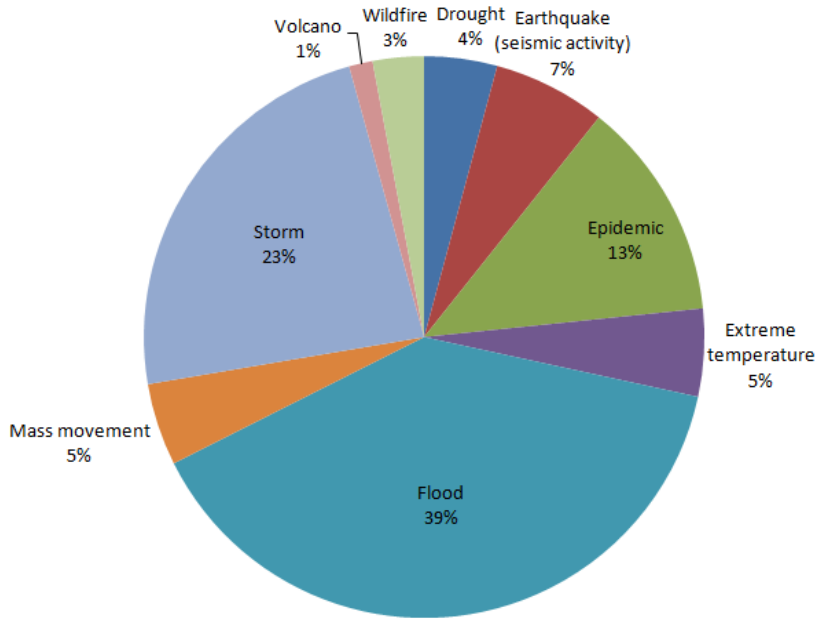


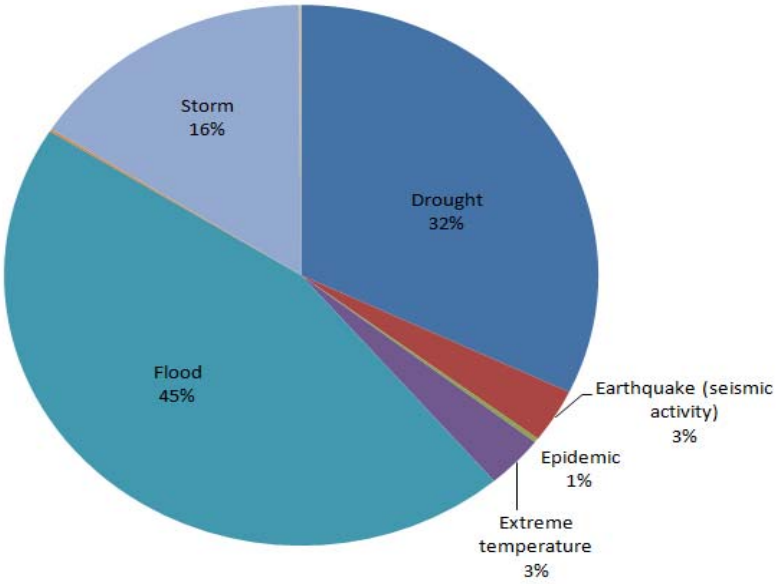
Fig. 1. **Trends in occurrence and victims**

In 2011, 332 natural disasters were registered, less than the average annual disaster frequency observed from 2001 to 2010 (384). However, the human and economic impacts of the disasters in 2011 were massive. Natural disasters killed a total of 30.773 people and caused 244.7 million victims worldwide (see Figure 1). Economic damages from natural disasters were the highest ever registered, with an estimated US$ 366.1 billion.

Over the last decade, China, the United States, the Philippines, India and Indonesia constitute together the top 5 countries that are most frequently hit by natural disasters. In 2011, the Philippines experienced the highest number of natural disasters ever registered in its history (33). The country was affected by 18 floods and landslides, 12 storms, 2 volcanic eruptions and one earthquake. Tropical cyclone 'Washi' (Sendong) struck the country in December and caused 1.439 deaths, making it the most lethal storm worldwide in 2011.



The ratio of natural disaster in the World (2000 – 2011)
Ratio of Natural disaster related to climate change is high



The ratio of affected people by natural disaster in the World (2000 – 2011)
Ratio of Natural disaster related to climate change is around 90%

Amongst the top 10 countries in terms of disaster mortality in 2011, seven countries are classified as high-income or upper-middle income economies (see World Bank income classification). These countries accounted for 79.2% of global reported disaster mortality in 2011, mainly due to the Tōhoku earthquake and tsunami in Japan on March 11th. This mega-disaster caused nearly 19.850 deaths,

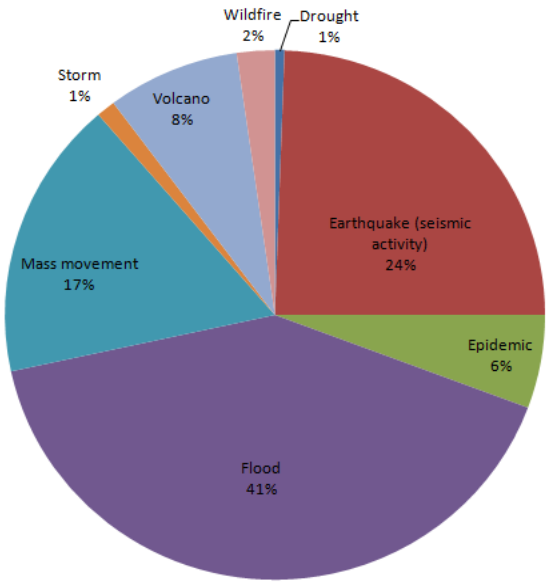
representing 64.5% of worldwide disaster mortality in 2011.

The Tōhoku earthquake and tsunami in Japan was the most expensive natural disaster ever recorded, with estimated economic damages of US$ 210.0 billion. Floods in Thailand that occurred from August to December (US$ 40.0 billion), the February 22nd earthquake in New Zealand (US$ 15.0 billion), and storms in the United States in May (US$ 14.0 billion) and April (US$ 11.0 billion) also added significantly to the total disaster damages of 2011.

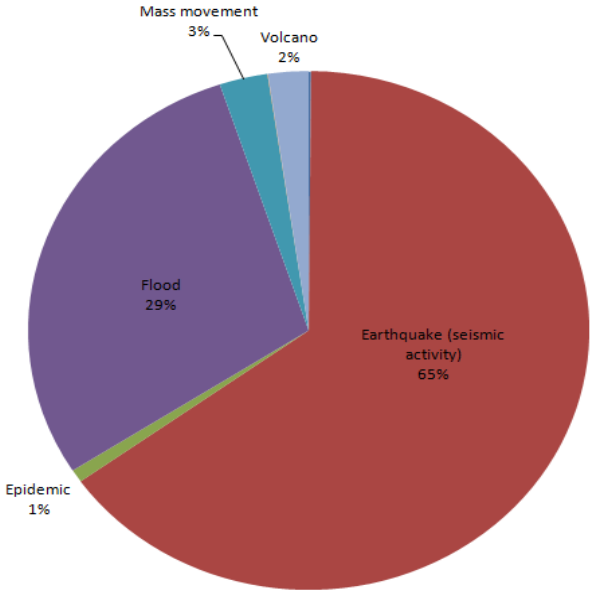
The disaster that made the most victims in 2011 was the flood that affected China in June, causing 67.9 million victims. Furthermore, China was affected by a drought from January to May (35.0 million victims), a storm in April (22.0 million victims) and another flood in September (20.0 million victims), further contributing to a total of 159.3 million victims in China in 2011, a figure representing 65.1% of global reported disaster victims. Droughts and consecutive famines made many victims in Ethiopia (4.8 million), Kenya (4.3 million) and Somalia (4.0 million). When considering the population size of the country, 42.9% of Somalia's population was made victim of natural disasters in 2011, mostly due to drought.

1.2. *Overview of disaster situation in Indonesia*

Major disasters are wildfire, drought, earthquakes, Epidemic, floods, Mass movement, forest fires, vulcanos



The Ratio of Natural Disaster (2000 – 2011)



The ratio of affected people by natural disaster (2000 – 2011)

Top 10 Natural Disasters in Indonesia
for the period 1900 to 2013
sorted by numbers of total affected people:

Disaster	Date	No Total Affected
Drought	1972	3,500,000
Earthquake (seismic activity)	27-May-2006	3,177,923
Wildfire	Oct-1994	3,000,000
Earthquake (seismic activity)	30-Sep-2009	2,501,798
Drought	Sep-1997	1,065,000
Flood	23-Dec-2006	618,486
Flood	9-Feb-1996	556,000
Earthquake (seismic activity)	26-Dec-2004	532,898
Flood	14-Mar-1966	524,100
Flood	27-Jan-2002	500,750

Table 1. Top 10 Natural Disasters in Indonesia [2)]

Summarized Table of Natural Disasters in Indonesia from 1900 to 2013

Type of disaster		# of Events	Killed	Total Affected	Damage (000 US$)
Drought	Drought	9	9,329	4,804,220	160,200
	ave. per event		1,037	533,802	17,800
Earthquake (seismic activity)	Earthquake (ground shaking)	102	30,065	8,477,214	7,059,326
	ave. per event		295	83,110	69,209
	Tsunami	9	168,372	580,520	4,506,600
	ave. per event		18,708	64,502	500,733
Flood	Unspecified	51	1,802	2,549,600	90,638
	ave. per event		35	49,992	1,777
	Flash flood	32	2,037	1,236,455	247,500
	ave. per event		64	38,639	7,734
	General flood	66	2,528	5,028,453	2,157,909
	ave. per event		38	76,189	32,696
	Storm surge/coastal flood	1	11	2,000	-
	ave. per event		11	2,000	-
Volcano	Volcanic eruption	52	18,271	1,176,026	344,390
	ave. per event		351	22,616	6,623
Wildfire	Forest fire	9	300	3,034,478	9,329,000
	ave. per event		33	337,164	1,036,556

Created on: Mar-21-2013. - Data version: v12.07
Source: "EM-DAT: The OFDA/CRED International Disaster Database
www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium"

Table 2. Summarized Table of Natural Disasters in Indonesia

During January 2013, BNPB recorded 120 disasters occurred in Indonesia. This is the data while considering the catastrophic events have all been reported to BNPB. Of 120 disasters caused 126 people dead, 113,747 people suffer

and displaced, 940 houses damaged, 2.717 houses were damaged, 10,945 houses with minor damage, and damage to public facilities.

Flooding in Pluit residential Jakarta

Flooding in the center of Jakarta

Approximately 96 percent of disasters is still dominated by hydro-meteorological disasters such as floods, landslides, cyclones, tidal waves, floods and landslides. During the January 2013, 36 floods occurred that caused 61 people died and 110.129 people suffered and fled. Jakarta Flood that occurred during 15-27 January 2013 caused 41 people dead refugees reach 45,000. Similarly landslide that occurred 25 times leaving 40 people dead. While the tornado, occurred 42 times the incidence and cause the death of the victim as many as 3 people, 616 homes were severely damaged, 2626 houses were damaged, 2145 houses with minor damage, one health facility, 6 educational facilities, and 14 worship facilities

Evacuation of flood victims in jakarta

To cope with the disaster, BNPB has done a good disaster preparedness and emergency response. For emergency standby and emergency response to floods and landslides since the end of December 2012 to the present, the fund has distributed BNPB ready around Rp 180 billion to various regions in Indonesia affected. Previously been made contingency plans floods and landslides at the national level. In addition to coordinate with ministries / agencies and BPBD, socialization, rehearsal, and so on. In disaster management, mentoring BNPB Government, both logistical assistance, equipment, funding, managerial and administrative.

Tornado in Wonosobo, Demak

Year 2013 has entered the fourth month. During this first quarterly tri disaster not incessantly occur in various regions in Indonesia, ranging from floods, landslides, hurricanes, to earthquakes and volcanic eruptions. Based BNPB recording, transient data has been mentioned occurred more than 300 disasters in the first quarter, so on average 10 times the event occurs every day. It is proved so much disaster threat to people's lives in Indonesia, especially those living in disaster-prone areas. A total of 95% over a hydro-meteorological disasters such as floods, land landslides, and tornado.

Flooding on Grobogan, Center of Java

The number of catastrophic events from earlier in the year to March, tend to decrease, ie 120 times in January, decreased to 91 times the incident in February, and 95 times in the month of March. In 3 months cyclones always dominate, followed by floods. In terms of casualties and damage, to date the dead and missing from the disaster more of 200 lives, where the dead and missing mostly caused by floods and other disasters landslides. A total of 306 disaster events occurs, also causing damage to the house 2.818 damaged units, 3.316 units were damaged, 20,759 units minor damage, besides 27 educational facilities, 26 units worship facilities, health facilities and 8 units also not spared from damage.

Landslide on west Bandung, West Java

The victim died and disappeared in March 2013 due to the many landslides, as many as 20 people, of which 17 of them are victims of landslides that occurred in District Cililin, West Bandung, West Java.

Occurrence of landslides in the Village District Mukapayung Cililin West Bandung regency of West Java province occurred in

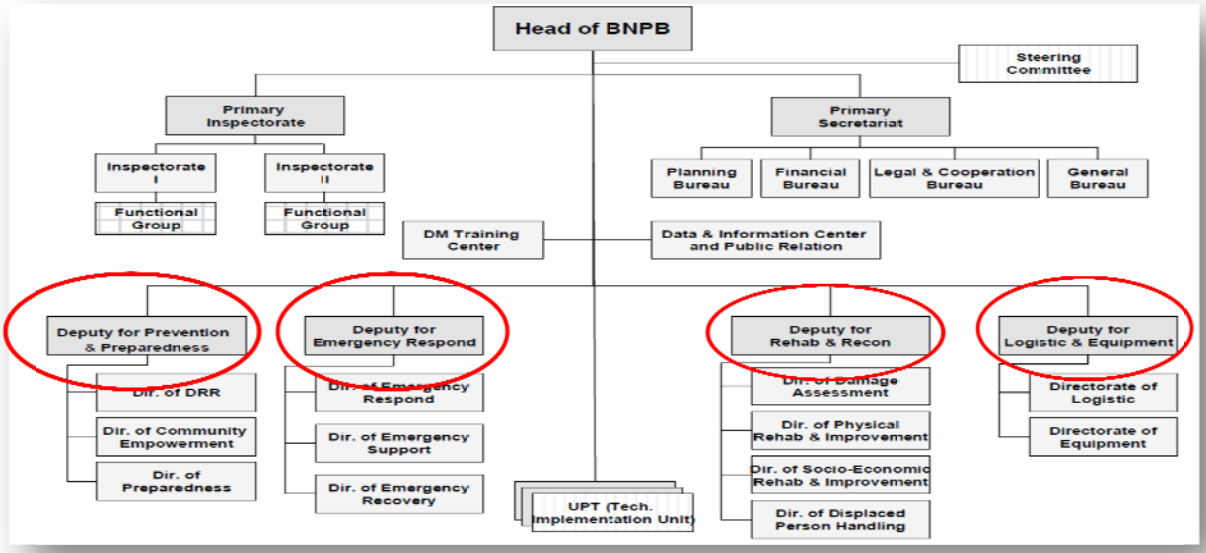
Early morning of March 25, 2013. Some of the factors that triggered the landslides are as follows:Heavy rains since early morning at 03.00 am, with high rainfall 52mm / day or 4 times the normal daily precipitation ;

1. The thickness of the soil is very thick, the roots just do not hang down to bedrock;
2. The slope was very precipitous;
3. Effect of water eyes causing erosion of the middle ground that is on it unstable

In addition to causing deaths and missing in landslide Cililin also made 466 displaced soul. Some houses also recorded damage, rather heavily damaged 14 units and 31 units scattered minor damage Hamlet Sand Tawir, Cikoneng, and Cigadung Wetan.

To cope with this disaster, the joint team of BPBD, military, police, some social organizations, Indonesian Red Cross, and local communities to make some effort, ie to search victims buried by landslides and evacuate residents whose homes are threatened. Some posts were also established disaster management, namely postal logistics, public kitchens, health, and command posts.

1.2.1. *Structure Organization of National Agency for Disaster Management (BNPB)*



Structure Organization of BNPB

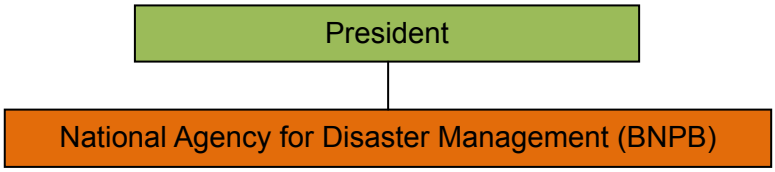
1.2.2. *Disaster Management Framework in Indonesia*

Law No. 24/2007 on Disaster Management as the basis to develop National System for Disaster Management in Indonesia, Disaster Management System is "an overall regulating system which include legislation, institutionalization, planning, budgeting and science for disaster management, in order to ensure the implementation of disaster management is well-integrated and coordinated"

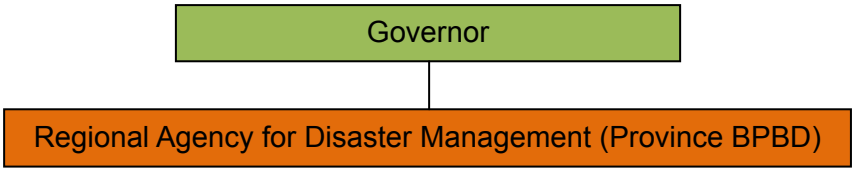
BNPB's duties :

a. Guidelines & directives : prevention, emergency response, rehabilitation & reconstruction.
b. Standardisation & the need of DM implementation
c. Informasi of activities to the public
d. Report to President once each month & any time
e. Making use of domestic/int'l assistance
f. Accountability of budget
g. Guidelines on BPBD

National Level



Province Level



Regenty/Municipal Level

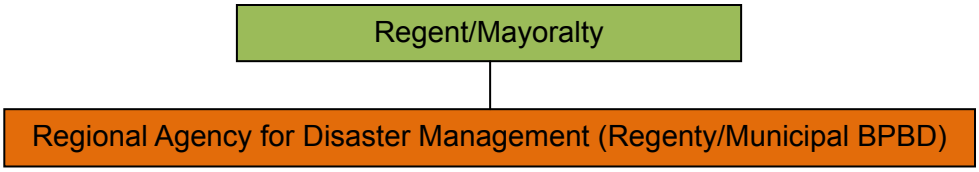


Fig 1 Administrative Disaster Management System in Indonesia

1.2.3. Disaster management plan

BNPB policy direction and strategy is the result of the identification of the strategic environment BNPB conducted on the internal and external environment. Based on the results of the strategic environmental assessment externally and internally as well as synchronization to the direction of national policies and strategies in the field of disaster management, the policy and strategy of the National Agency for Disaster Management activities within the next five years (2010-2014) is

1. Disaster implementation of planned, directed, coordinated, integrated and comprehensive and accountable
2. Increased awareness, ability and preparedness for disasters through the creation of a rapid reaction force of disaster
3. Completion of handling emergency disaster victims in post-disaster areas quickly, accurately and effectively, and coordinated / integrated
4. Completion of recovery of physical infrastructure in the region and non-physicalthe after disaster of an integrated and comprehensive

1.2.4. Disaster management related budget in Indonesia

National disaster management plan 2010-2014 (*Renas PB*) load the program and focus priorities as the basis to make disaster management. Program is a translation of the vision and mission as well as the choice of action in accordance with the risk management. Indonesia disaster management system that is currently being built has 5 pillars in the form of sub-system legislation, planning, institutional, funding and capacity building. System was built to address the problems facing today and translated into the following programs : 1) Strengthening legislation and institutional capacity; 2) Disaster planning; 3) Research, education and training; 4) Increased participation and community capacity disaster risk reduction; 5) Disaster prevention and mitigation; 6) Early warning; 7) Preparedness; 8) Emergency Response; 9) Rehabilitation and reconstruction.

As for the budget needed to undertake disaster relief during the 5-year term in a national disaster management plan is Rp. 64.475.060.000.000,- (Sixty four trilion four hundreds seventy five billion sixty million rupiahs) or an average of Rp. 12.895.012.000.000,- (Twelve trillion eight hundred ninety five billion twelve million rupiahs) per year.

Indicative budget of each program in the national disaster management plan :

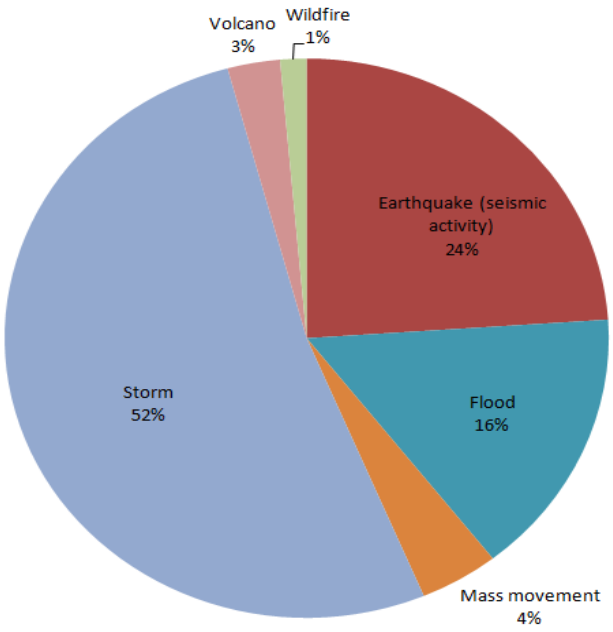
No.	Program	Indicative budget (billion Rp.)
1.	Strengthening legislation and institutional capacity	30,638.00
2.	Disaster planning	24.16
3.	Research, education and training	368.50
4.	Increased participation and community capacity disaster risk reduction	2,855.60
5.	Disaster prevention and mitigation	6,665.50
6.	Early warning	822.00
7.	Preparedness	7,415.80
8.	Emergency Response	1,008.50
9.	Rehabilitation and reconstruction	14,677.00
	Total	**64,475.06**

Source of funding for the implementation of disaster management plans obtained from the state budget revenue and expenditure (APBN), budget

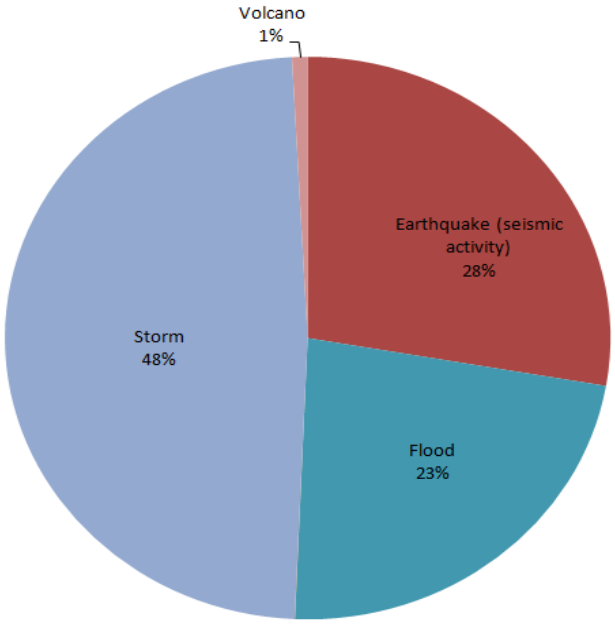
revenue and expenditure (APBD), and the support of the private sector and donor agencies. budget comes from the state budget funds allocated annually through the budget of each ministry / agency to ensure that disaster management can run continuously

By government law no. 24/2007 on disaster management and government regulation no. 22/2008 on the funding and management of disaster relief, disaster relief funds are used by governments, local governments, BNPB and / or appropriate duties and functions. in a disaster situation, the funds allocated for disaster relief programs for disaster risk reduction. the situation there is the potential for disaster, the funds allocated for disaster preparedness activities, the development of early warning systems and disaster mitigation activities. to anticipate emergency situations, the government is ready to allocate funds (on-call budget) that should be available for emergency response needs.

1.3. *Overview of disaster situation in Japan*



The ratio of natural disaster (2000 – 2011)



The ratio of affected people by natural disaster (2000 – 2011)

Japan has wide variety of natural disasters. Also one of the countries affected unpredicted events of natural disaster such as :

- Earthquakes
- Tsunamis
- Volcanic Eruptions
- Typhoons (July – October)
- Heavy Monsoon Rains (May)
- Floods
- Landslides
- Snow Avalanches

Japan is since 1950 many large scales Earthquake, Tsunami, and Typhoons struck the country, which caused massive damage and great loss of economy. That kind of enormous disasters killed huge amount of people. In fact the development of disaster counter measures has been contributing to the development of sustainable disaster management system especially, advanced weather forecasting system and disaster communication system.

a. The commonest disaster in Japan is Earthquake. Japan can have up to 5000 earthquakes each year, which is about 10% out of the total occurred of the world.

The government also publishes a map showing the probability that each area of Japan will experience tremors equivalent to a rating of Shindo Lower 6 or

higher within the next 30 years. (At this level, furniture shifts and most people find it difficult to remain on their feet.)

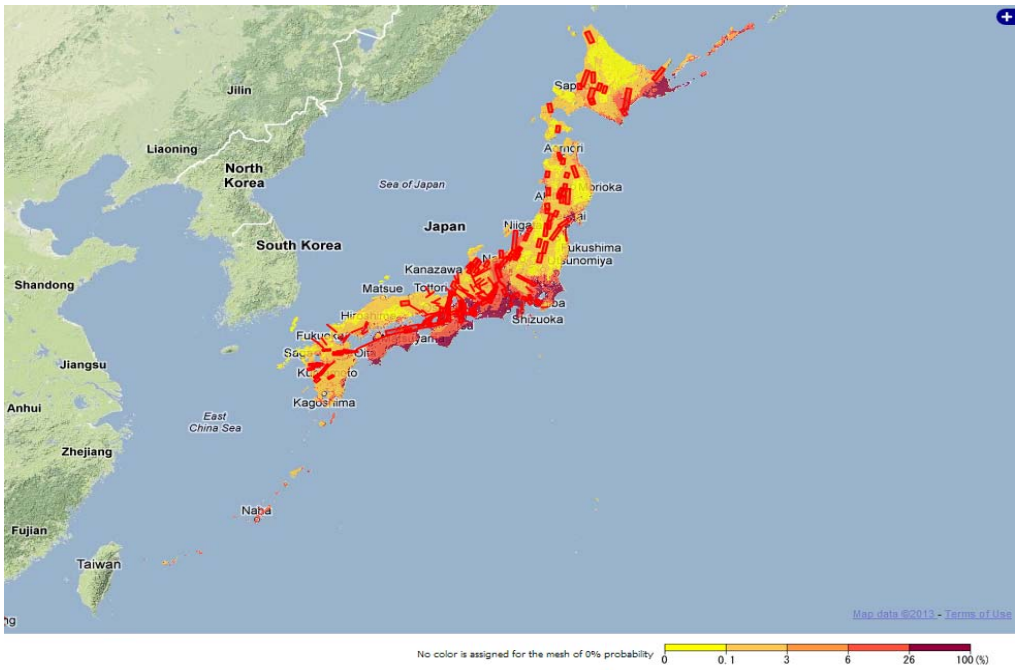


Chart 1. Probability of Shindo Lower 6 Tremors within the Next 30 Years (Source: Japan Seismic Hazard Information Station (J-SHIS))

Map data showing predicted seismic activity is based on research data obtained by the National Research Institute for Earth Science and Disaster Prevention. The map can be enlarged to show detailed information for any location in Japan.

As well as publishes a map multi-hazard (flood, inland flood, high wave, tsunami, sediment, volcano) showing the probability that each area of Japan.

As a result of Earthquakes, Tsunami can also develop to cause catastrophic damages to the coastal belt of the country, which are large waves that crash up against the shore and can wash away people, buildings, and bridges. For example recent EQ and Tsunami (2011, Tohoku Pacific Ocean Earthquake)

The Great East Japan Earthquake occurred on March, 11, 2011 at 2:46 pm at a magnitude of 9.0 at a depth approximately 25 kilometer and

tsunami hit along Sanriku offing, near the east coast of Honshu, Japan. The magnitude of the main shock was the largest in Japan's History. Either way it was the strongest quake ever recorded in Japan. It has been followed by more than 150 powerful aftershocks. Tohoku Pacific Ocean Earthquake followed by jet storm tsunami of 10 meters high waves devastated the entire eastern Japan namely Fukushima prefecture, Iwate, Sendai, Soma city, Miyagi prefecture.

The confirmed death toll from the earthquake and Tsunami that battered Japan's northeast coast rose to 14,084 and Japan holds out little hope for 13,551 officially listed as missing[10]. Larges areas of the countryside remained surrounded by water and unreachable.

The government said 275,000 people have been evacuated to emergency shelters. Civil society has emphasized the need for more community involvement through organizing community volunteers. Meanwhile, community members of those affected areas have started working which will gear up the relief and rehabilitation activities of the earthquake and Tsunami affected areas. The Great Hanshin Awaji experience and other disaster related experiences had helped Japan to recover soon from this great disaster and human catastrophe.

b. Volcanic eruptions are the next dangerous disaster facing in Japan. There are 108 active volcanoes in Japan which means 7 % of the world's total active volcanoes over in Japan. A volcanic eruption can discharge ash and lava all over the surrounding areas including populated area too.

c. During the rainy season Typhoons are occurring in Japan. Severe storm may cause many damages along with landslides and floods. Japan hits about 29 Typhoons in the year. Some recorded due to the worst meteorological changes, which cause significant damage and loss of the human life.

Namely to show on chart 2 – 4 of some statistic actual parameter.

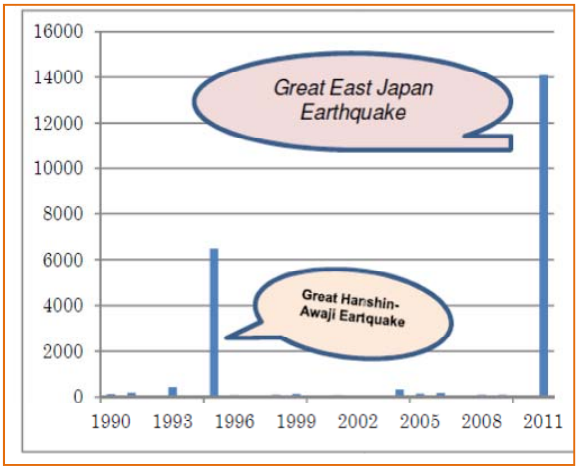


Chart 2. *The number of deaths and missing persons in disasters*

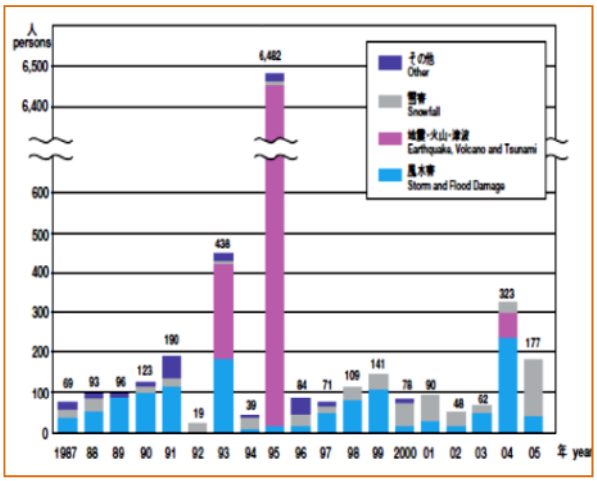


Chart 3. The number of deaths and missing persons by type of disaster. (Source : Prepared by the cabinet office based on date from The Fire and Disaster Management Agency)

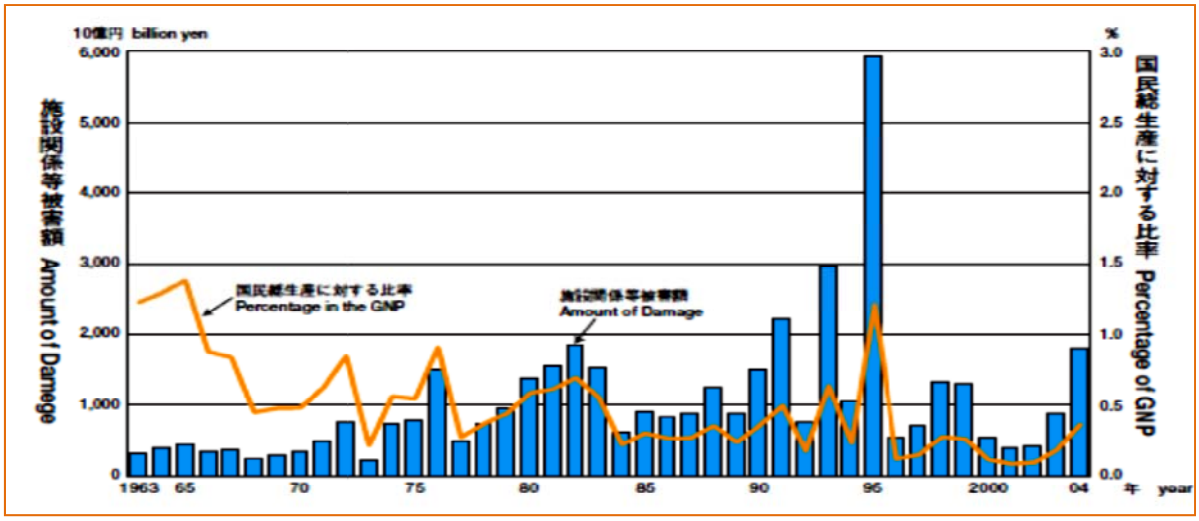
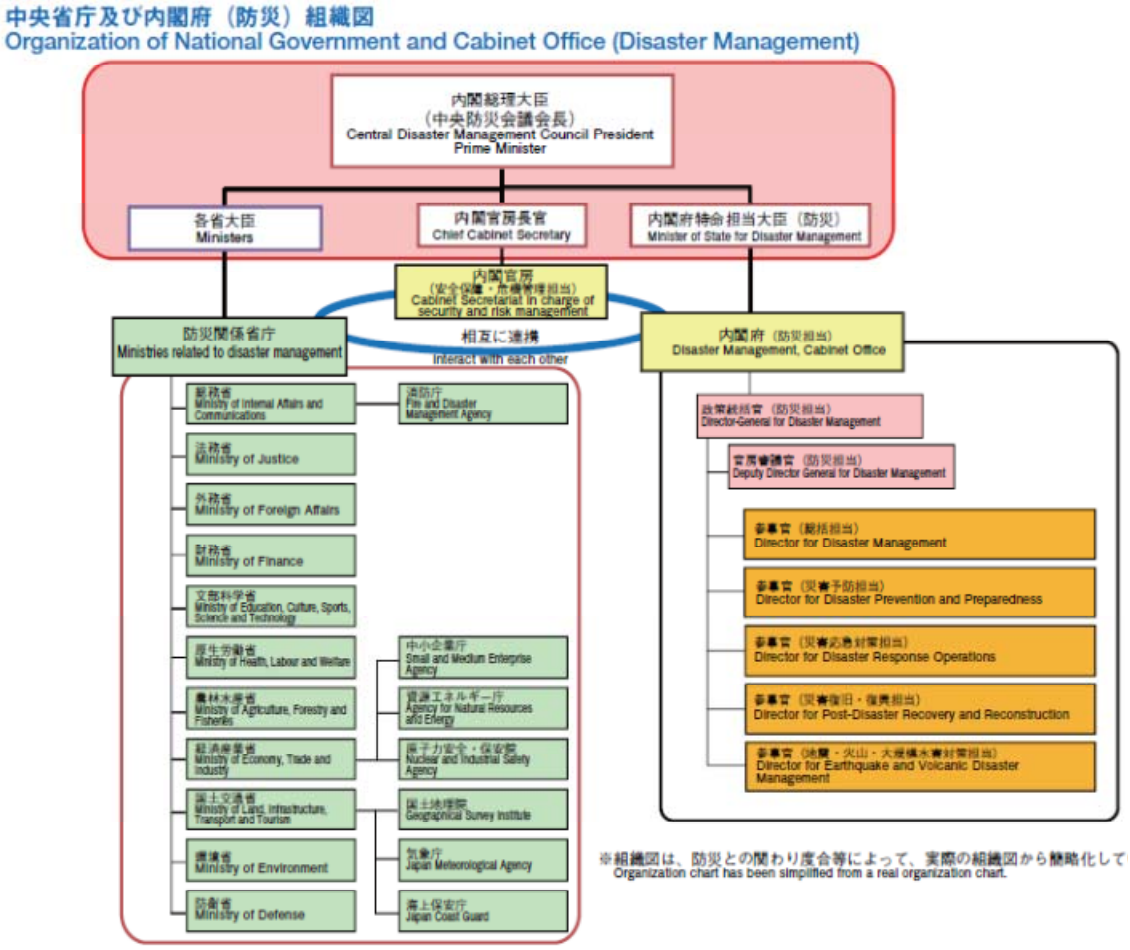


Chart 4. *Amount of damage to facilities due to disasters .(source prepared by the Cabinet office based on data from related ministries)*

1.3.1. Structure organization of National Government and Cabinet Office(Disaster Management)



Structure organization of National Government and Cabinet Office(Disaster Management)

1.3.2. *Disaster Management Framework in Japan*

Chart 5. Disaster Management System

In Japan, the disaster management system has been developed and strengthened following the bitter experiences of large-scale natural disasters and accidents. Disaster Management of Japan is categorized into 3 levels including national, regional and municipal level. The significance of each level is detailed as follows :

a. National level

The Prime Minister is the National Commander through the National Disaster Management Council, and the designed government organizations (23 ministries and agencies), and designated public cooperation (63 organizations including independent administrative agencies, Bank of Japan, Japanese Red Cross Society, NHK, electricity and gas companies). In this connection, the national council is responsible for formulation and promoting the implementation of the Basic Disaster Management Plan.

Meanwhile, the other two designed agencies of government and public cooperation are responsible for formulation and implementation of the Disaster Management operation plan.

b. Prefectural level

The Governor is the commander ordering via the Prefectural Disaster Management Council, and the designed government organization and public corporations in local. The prefectural council will conjunctionally work with the

mentioned designed agencies to formulate and promote the implementation of Local Disaster Management Plan.

c. Municipal level

In this level, the Mayor of City, Town and Village is the commander, as the same of Governor in prefectural level, will take function through Municipal Disaster Management Council to formulate and promote the implementation of Local Disaster Management Plan. To correlate with the three disaster management systems, Japan has made up the basic plans, operation plan, to effectively response to various types of disaster and to properly use in areas. The first is Basic Disaster Management Plan the key plan for disaster reduction activities prepared by the Central Disaster Management Council based on the Disaster Countermeasures Basic Act, the second is Disaster Management Operation Plan made up by each designed government organization and designed public corporation, and the last one is Local Disaster Management Plan set up by each prefectural and municipal council. The last two plans are based on the Basic Disaster Management Plan.

1.3.3. Disaster management plan

Basic Disaster Management Plan is the plan to state on comprehensive and long- term disaster reduction issues such as disaster management related system, disaster reduction projects, early and appropriate disaster recovery and rehabilitation, as well is scientific and technical research. For the Plan‘s structure, it consists of various plans for each type of disasters which is categorized into 2 main points of natural disaster and accident disasters. (Chart 6.)

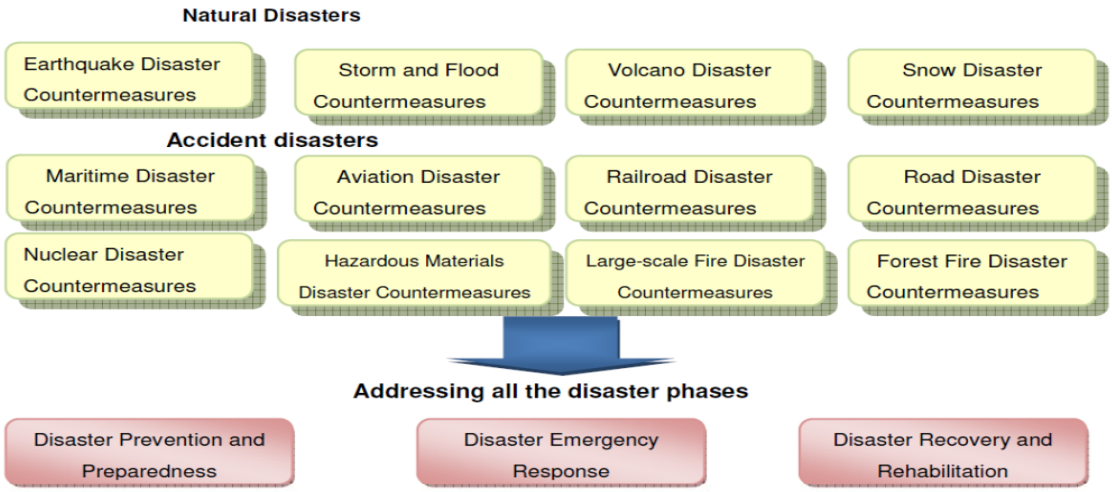


Chart 6. Structure of basic disaster management plan

The tangible countermeasures will be taken by each stakeholder such as the national and local governments, public corporations and other entities in term of the disaster phrases of prevention and preparedness, emergency response, as well as recovery and rehabilitation. Additionally, the conceptual formulation of the Basic Disaster Management Plan has emphasized on the important points of hazard and risk mapping, clarification of Jurisdiction, responsibilities and procedures on establishment of emergency response headquarter, evacuation guidance and order to citizens, designation of evacuation area in advance, procedure for disaster information gathering and dissemination, and public participation.

1.3.4. Disaster management related budget in Japan

The National budget for disaster management is approximately 4.5 trillion yen (average annual budget from 1955 to 2004), accounting for approximately 5% of the total amount of budget for general accounts. The percentage for each field is a) Scientific Technology Research 1.3% b) Disaster prevention and preparedness, 23.6% c) National Land Conservation 48.7% d) Disaster Recovery and Rehabilitation, 26.4%. This year after Great Tohoku Earthquake, Government of Japan allocated 63 trillion yen for rescue, relief and rehabilitation. (Source internet)

CHAPTER 2

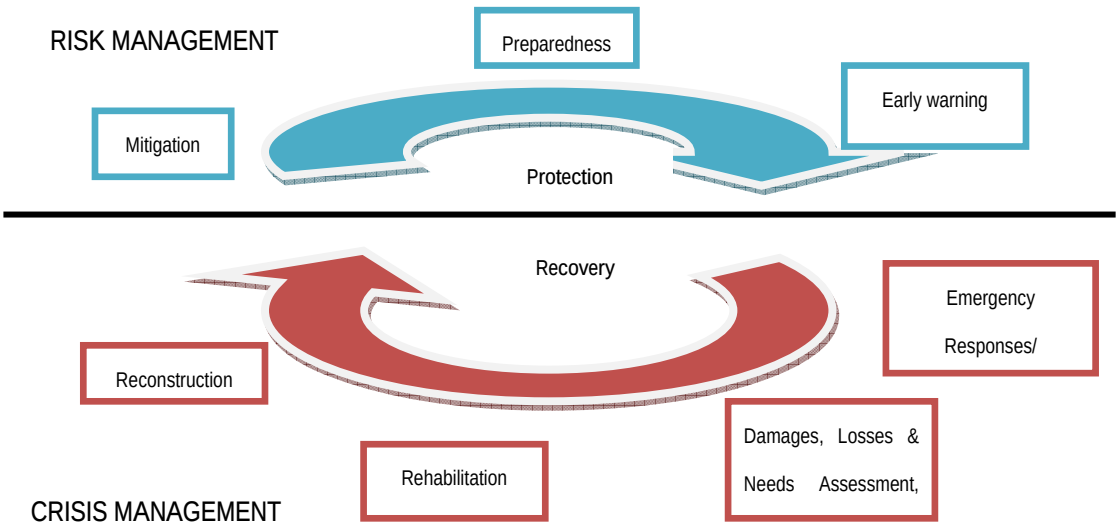
2.1 Disaster Risk Reduction - What is it and why do need it?

Disaster risk reduction (DRR) is a systematic approach to identifying, assessing and reducing the risks of disaster. It aims to reduce socio-economic vulnerabilities to disaster as well as dealing with the environmental and other hazards that trigger them : Here it has been strongly influenced by the mass of

research on vulnerability that has appeared in print since the mid-1970s.[1] It is the responsibility of development and relief agencies alike. It should be an integral part of the way such organisations do their work, not an add-on or one-off action. DRR is very wide-ranging: Its scope is much broader and deeper than conventional emergency management. There is potential for DRR initiatives in just about every sector of development and humanitarian work.

Another approach is the circle of disaster management (disaster management cycle) which consists of two major activities. The first was before the disaster (pre-event) and the second is the aftermath of a disaster (post-event). Activities after a disaster can be a disaster response / emergency response (emergency response) or disaster recovery. Activities undertaken before the disaster can be a disaster preparedness (disaster preparedness) and disaster mitigation (reducing the impact of disasters). There is also a mention of the term disaster reduction, as a combination of disaster mitigation and disaster preparedness (Makki, 2006).

The most commonly cited definition of DRR is one used by UN agencies such as UNISDR and UNDP: "The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development."[2]



Disaster management cycle

1 Wisner B et al. 2004, *At Risk: Natural hazards, people's vulnerability and disasters* (London: Routledge)

2 *Living With Risk: A Global Review of Disaster Reduction Initiatives*, UNISDR, 2004; pg. 17

The disaster risk reduction framework is composed of the following fields of action, as described in Living with Risk : a global review of disaster reduction initiatives :

a. Risk awareness and assessment including hazard analysis and vulnerability/capacity analysis;
b. Knowledge development including education, training, research and information;
c. Public commitment and institutional frameworks, including organizational, policy, legislation and community action;
d. Application of measures including environmental management, land-use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments;
e. Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities.

“Disaster Risk Reduction (DRR) is a program that is very urgent to be done by governments, nongovernmental organizations (NGOs) and the entire community because the majority of the Indonesian people living in areas that have high potential for the occurrence of natural disasters. If the program is not implemented soon, the potential loss of both property and life will be very large. It happened because of the perspective of geological Indonesia is a region located at the meeting point of tectonic plates, the Eurasian and Indo Australian plate, which is always moving so potentially cause cracks / fractures which can cause earthquakes and tsunamis.” This statement monthly speaker at the seminar conducted by the Centre for Rural and Regional Studies, Gadjah Mada University, Yogyakarta, on Thursday, March 4, 2010. The seminar has become a tradition every other Thursday of the first week, featuring speakers on that occasion, Dr. Ir. Dwikorita Karnawati a disaster expert from the Faculty of Engineering, Gadjah Mada University.

In contrast to the paradigm that has been adopted by the government is only looking at the extent of the disaster risk reduction activities of the technical side of disaster, speakers with colleagues from the Faculty of Engineering has been trying to implement a new model that DRR DRR-based approach to holistic / comprehensive. Such programs not only touch the technical aspects but also social, economic and cultural aspects. This approach was developed on the basis of the

fact that people who have both economic security it also has good resistance to disaster anyway. The case of the earthquake that struck Chile causing casualties were far fewer than the case of catastrophic earthquake in Haiti is one of the facts that support this assumption. Although the earthquake in Chile have a greater magnitude of the earthquake in Haiti, but the incident caused fatalities are much less compared to the catastrophic earthquake in Haiti. Socio-economic conditions of Chile's citizens better citizens in Haiti is the deciding factor.

2.2 The importance of building resilient to disasters

Building disaster resilience is the term we use to describe the process of helping communities and countries to be better prepared to withstand and rapidly recover from a shock such as an earthquake, Tsunami, Vulcano, drought, flood or cyclone.

Why is disaster resilience important?

In 2010 natural disasters affected more than 200 million people, killed nearly 270,000 and caused around $110 billion of damage. In 2011 we faced the first famine of the 21st Century in the Horn of Africa, multiple earthquakes, tsunamis and other natural disasters around the word.

Over the coming decades it is expected that both the frequency and intensity of disasters will continue to increase as a result of climate change, urban migration, population growth and increased scarcity of natural resources.

This currently, a new paradigm in disaster management, implementation, guided by the results declaration Hyogo Framework for Action (HFA) 2009-2015, namely (1) ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation, (2) identify, assess and monitor disaster risks and enhance early warning, (3) use of knowledge, innovation and education to build a culture of safety and resilience at all levels, (4) reduce the risk factors underlying, (5) strengthen disaster preparedness for effective response.

Efforts to empower communities in disaster-prone areas is very important so that they know about the potential disasters that frequently occur and understand the natural signs that signaled the coming disaster, together explore the values of local wisdom to preserve the balance of nature as well as knowing what to do if there is a disaster . The public were invited to map its territory, making evacuation route where to save themselves if there is a disaster, where the safe spot to gather and which agency should be contacted. This is important, because until now even the experts can not predict when the days are a disaster occurs.

All of this is a real effort involving the community so that they are aware of disaster, is in line with the concept of community development seeks to empower individuals and groups of people by providing information and skills they need to effect change in their own communities. The effort to mobilize the community should start from the principle that within any community has a lot of knowledge and experience which, if used in creative ways, can be channeled into collective action to achieve the desired goals.

According to the Disaster Management Consultants (Ujang Dede Lasmana) : State government announced a tough or resiliens to disaster, but it will not materialize if the preparedness and resilience of not starting a family. Family preparedness is the foundation of the State of disaster resilience. Families who have resilience or rapid recovery after the disaster accounted for the largest portion of the nation's resilience. Standby family will support preparedness and risk reduction measures as a culture for the civilization of a nation.

In this case there are seven simple steps that can be done to make families resilient and survive in times of disaster or emergency occurs. These seven steps are executed since the days before the disaster until after a disaster occurs. Steps 1-4 are the Pre-disaster phase, while step 5 when disaster / emergency, to steps 6-7 after a disaster / emergency occurs. Depending on the type of disaster, could step in on the current phase of a disaster, such as floods

The following 7 steps are :

1. Recognize Threat in Around the Home
2. Create an Emergency Plan For Family
3. Prepare Emergency Bag
4. Secure Home and Simulation Perform Together Whole Family Members
5. Emergency Measures to Protect Yourself While Happen
6. How to Provide Emergency Relief
7. Keep communication and beware danger supplementary

Characteristics of disaster resilient communities

To get to the disaster resilient communities, we must improve our ability to 4 things :

1. **Our ability to anticipate** every threat or imminent harm. Therefore this stage we supposedly able to make predictions, analysis, identification and review of disaster risk. This capability requires science and technology,

both the advanced and the appropriate. Also of modern knowledge to wisdom that already exist in the local community. Lessons can we taken from May 26, 2006 earthquake disaster is that the area Opaque long time, which is prone to earthquakes a time will happen again (between 50 or 60 years will come). It should be anticipated.

2. **The ability to resist or avoid threats the disaster**. Ability to fight really depends of the magnitude of the threat that we face. Is the ability resources we are able to deal with the impact forces that would posed? As an example that still exist in our memory, the eruption of Mount Merapi in 2010. Hot clouds glide up to 17 km from the peak of Merapi, could we resist or reject heat glide material is said to reach 800 degrees celcius it? If not able, then we should avoid trajectory of the hot clouds or "wedhus gembel" is. in the event avoid these hazards, we return to the philosophy keep the public to danger. a job which is not easy to do.
3. **The ability to adapt the disaster and its aftermath posed.** If we are not able to resist or dodge, then we should be able to reduce, divert or accept the risk that a disaster will happen. Principles apply risk management to cope with disasters. Effort minimize or mitigate the impact of disasters, such as making buildings earthquake resistant, build shelter vertically, making evacuation paths and so should applied. Risk transfer or risk transfer, such as insurance disaster began to be cultivated. Basically adapt disaster is intended that the public's ability to receive the higher the risk. It is concerned with philosophy, living harmony with disaster.
4. **The ability to recover quickly after the disaster**. Resilience of the community in dealing with disasters can be seen from the ability (power Resilience) to recover after a disaster overwritten. Community in DI Yogyakarta, Bantul regency in particular have proved This toughness. After the earthquake disaster in 2006, Local governments and communities in Yogyakarta and Java Central has been able to carry out rehabilitation and reconstruction the damage inflicted. Even according to reports The World Bank, the recovery has gained appreciation from the world internationally, because in 2 years has been resolved. Not all disasters can be recovered quickly, many examples catastrophic events that make a society or country be worse off.

2.3 Paradigm Shift From Emergency Response To Disaster Risk Reduction

In the midst of the search is comprehensive alternative paradigm, a new approach emerged in seeing the disaster. Paradigm that is the perspective in managing the disaster as a whole began to see threats to cause effects that may occur. This approach is known as the approach to Disaster Risk Reduction (DRR). This approach saw the disaster as part of reasonableness, when elements of vulnerability was met with threats. Disaster was not seen as a rebuke moreover destiny, so do not be seen as a disaster merely a natural phenomenon that impacts forget.

Indonesia's emergency response paradigm shift in paradigm towards Disaster Risk Reduction very real stipulated in law no. 24 in 2007. Disaster management focused on aspects of disaster risk reduction, not just emergency response. Disaster risk reduction management is disaster planning system that starts from prevention, mitigation, preparedness, early warning and other governments by involving all stakeholders, public, private. The principle of participation the primary value. Especially the inclusion of all elements in all disaster risk reduction activities becomes inevitable. Considerable paradigm shift in the level of regulatory policy with the birth of supporting disaster risk reduction management, followed by institutional processes that underpin disaster risk reduction activities

CHAPTER 3 DISASTER RISK REDUCTION IN INDONESIA AND JAPAN

3.1. Disaster Risk Reduction in Indonesia

3.1.1. Strengthening legislation and institutional capacity

a. Formulation of rules, regulations and standard operating procedure for Disaster containing PB mechanism, including the division of tasks, responsibilities and resources, as well as coordination

   Already Establishment BPBDs throughout the region provinces, regencies and municipalities in Indonesia.

b. Standardization guidelines and reference disaster
c. Coordinating planning and policy making and policy implementation at the level of synchronization across ministries / agencies
d. Establishment and strengthening BPBD and completeness (Command Operational Center, the Regional Rapid Reaction Force)

   Strengthening the capacity building by developing operational center.

The main function of this development is the operational center for Disaster Management as a center of information for disaster management, coordination and implementation of early warning systems, coordination and command the emergency response operations.

Command the emergency response operations center

Operational center will be equipped with information systems and modern communication procedures and working mechanisms and specific standards.

e. Strengthening capacities in the region Disaster Management
f. Increasing the capacity of Human Resources in Disaster (technical PB) and the provision sufficient volunteers
g. Regionalization formation Depo Logistics, Training Centre and operational center for the development of infrastructure and resource optimization Disaster

Indonesia is an archipelago and located in disaster-prone areas. In order to deal with the disaster, BNPB distribute aid equipment to the 33 provinces and 265 districts / cities as disaster preparedness and institutional strengthening Regional Disaster Management Agency (BPBD) in January 2012.

Rubber boats and tents

Command/Rescue Car and ambulance

Distribution of aid to the province in the form of 33 BPBDs Logistics and Equipment. Logistical support in the form of food packs, clothing packs, other logistics package, and the package's death. While aid equipment such as evacuation equipment, communications, temporary shelter, vehicle operation, such as automobile rescue, rescue command car, car field kitchens, water treatment car, ambulance, truck versatile, trail bike.

Logistik dan evacuation equipment

While aid to BPBDs 265 districts / cities in the form of basic equipment, namely PB evacuation equipment, communications, temporary shelter, trail bike, portable water treatment. However, due to limited budgets, from BPBDs 265 districts / cities that received aid, new BPBDs 208 districts / cities receiving aid Operational Vehicle (Rescue Car, Rescue HT Cars, Rescue Command Car) and as many as 66 BPBDs districts / cities get Field Kitchen Car.

Field Kitchen Car

Field Technical Training held in Bogor, West Java Date 23 to 24 February 2012 which was followed by participants from BNPB and BPBD numbered 48 people. Technical training field include navigation (GPS),

rescue and evacuation,public kitchens and shelters, emergency tents, and rubber boats. Expected to attend Technical Training Field to equip participants and improve human resources in Disaster Response and understand how addressing disaster quickly and effectively, and can share their experiences in the workplace and the community unit.

Disaster drills for regional agency disaster management and volunteers

3.1.2. Disaster planning

a. Preparation National Planning Disaster and preparation regional Planning Disaster.
b. Mainstreaming Disaster plans into development plans

3.1.3. Research, education and training

a. Research and development of science and disaster management technology.

Disaster risk reduction is promoted by the National Agency for Disaster Management (BNPB) responded by Gadjah Mada University to establish cooperation in the field of research. The signing of a memorandum of understanding (MoU) between UGM and BNPB was held in December 2011. College as a center of excellence have

contributed through disaster research which is then used as a basis for policy formulation by the government.

Follow-up to the signing of a memorandum of understanding with the UGM-BNPB is the implementation of research cooperation of both sides, in this case the Centre for Disaster Studies (PSBA) to be representative of the UGM. until now have been 12 state universities that have been signed Memorandum of understanding.

Head of BNPB said colleges have an important role in disaster relief efforts. There are at least four areas that could be done by the universities as agents of disaster research, disaster consultant, partner in the preparation of the Medium Term Development Plan (RPJMD), and in the development of technology products for disaster mitigation.

b. Increased utilization and application of science and technology (through applied research) for Disaster Management, including for early warning

At the national level, early warning systems for several types of hazards, such as earthquakes, tsunami, volcanic eruption, and floods are available and functioning, and have been disseminated to the communities at risk. Evaluation on the early warning system for several types of disasters in the community level has also been done professionally. This effort has been supported by experts from research institutions/universities/disaster studies, by adapting the early warning system to the development of the local situation and condition, as well as by taking the existing indigenous knowledge and culture into account. For instance, the early warning system developed by the community of Merapi Forum. However, in many other regions, due to the limited capacity of human resources, the response to the early warning system being advocated still requires to be upscale.

c. Integrating Disaster knowledge elements in school curriculum

d. Implementation of disaster preparedness programs in schools

Disaster Risk Management Based on School Programme (PRBBS) is a program that facilitates the child and the school to have disaster preparedness in the face by way of capacity building through an understanding of disaster, mapping training, evacuation, and the exchange of information related P3K the theme.

This activity was conducted in January-July 2009, in six primary schools in Bogor located around the river Ciliwung the SDN Katulampa

1, 2 Katulampa SDN, SDN Katulampa 3, Kaler Sempur SDN, SDN and SDN Sempur Kidul Kampung Rambutan.

PRBBS developed with a 'child-centered' and 'adapt to climate change'. Related mitigation - adaptation to global climate change. Material PRBBS also enriched with educational materials and environmental protection. PRBBS organized by PILI Green Network along Dike Foundation and supported by the Indonesian Disaster Plan Indonesia.

Disaster Risk Management Based on School Programme

DRR education for tsunami disaster on Banda Aceh

e. Resource capacity building for disaster education

Increased public awareness in the field of disaster management

needs to be improved, especially in the world of school, since there are many schools in disaster-prone areas. These efforts are carried out considering most of the kids do not know the school and get the full attention related disaster risk reduction education.

This activity is a series of events beginning of an effort to improve the capacity of teachers who were in the area at risk. Expected that after the training, the participants can understand the knowledge about the basics of disaster preparedness through the concept of school-based school disaster preparedness, including basic first aid practices and skills in integrating the material into the disaster-school activities.

Over 50 students of senior high school (SMA) 1 Banda Aceh, their teachers with Prepadness Community (Compass) TDMRC Unsyiah, title Facilitator Training of Trainers on Disaster Preparedness School Hall of SMA 1 Banda Aceh, a form of capacity building and strengthening preparedness unit (task force) in disaster management levels of students.

The material presented at the first meeting include: team building, basic concepts facilitator, known disasters in the school environment. On the second day of the introduction of the concept of school-based disaster preparedness, and design school watching SOP. Topped with a table top simulation space and outside the classroom.

Training for trainers on Disaster Preparedness
Senior high school (SMA 1) Banda Aceh

f. Information sharing and learning between regions and with other countries
g. Public education through the dissemination of information related to disaster

A great hope for the media because the media has very important role

in "socializing" not only catastrophic events, but also the DRR and rehabilitation and reconstruction. Government, in this case BNPB and BPBD provincial / district / city need media support as one of the actors or agents that can disseminate information or disaster news and knowledge and influence society.

The media is expected to build community awareness or the public, especially the paradigm of risk reduction disaster or any understanding in the face of threats or situations during the disaster. DRR mainstreaming paradigm is important because the public will be able to

know the risk or disaster around him so community resilience in the face of a disaster can be materialized. Meanwhile, the strategic role lies in the ability media in the dissemination of news or information related to disaster making it accessible to people everywhere.

In addition to reporting on DRR, the media has should be able to provide appropriate information and accurately related to the disaster. Therefore, people who located in the disaster area can understand and prepare what to do to avoid a potential disaster that may occur. Public awareness of the expectations together because the majority of Indonesian people who live in middle and the potential catastrophic risk. However, the media also need to get support from the organizers Government disaster management, be it access to the data or disaster information.

3.1.4. Increased participation and community capacity disaster risk reduction

a. Strengthening the role of the media in fostering culture of preparedness for public participation
b. Development forum for disaster risk reduction (DRR) in the region

BNPB encourage the growth of informal institutions in the form of forums both nationally and locally. Nationally has been established National Platform for Disaster Risk Reduction which consists of college forums, civil society forums, forums international community, media forum, a forum of business institutions and forums from the Government. It was created as a platform a forum to improve coordination mechanisms among Indonesia's disaster management actors. as is realized with coordination in the NT is one point weak in the NT. This

establishment is in line with the mandate of Law. 24/2007 because basically this platform underpinning parties to be able to communicate and contribute in implementation of disaster management in Indonesia.

Along with the efforts to institutionalize DRR at the national level, many provinces and districts/municipalities throughout Indonesia have started to set-up local platforms in several regions, especially those with similar hazard such as Forum Merapi (for volcano eruption hazard), Forum Bengawan Solo (for river basin flood hazard), and other hazards. Platforms were also established based on themes, such as Consortium for Disaster Education, or based on stakeholder groups, such as the University Forum for DM/ DRR which has 27 members of universities scattered in various parts of the country.

Head of BNPB visits to Merapi Radio Community

c. Increasing the participation of volunteers and stakeholders

d. The development of community-based disaster risk reduction program

Anticipation and disaster management is not the responsibility of government completely, but a shared responsibility between government and society.

Since 2007, with support from Cordaid Governmental Development Program held a Community Based Disaster Risk Reduction (CBDRR). CBDRR is a participatory process of community empowerment to manage before, during, and after disasters.

Community invited to perform studies of disasters, disaster management plan, and execute it through self-help groups involving various stakeholders. Through this program, people are expected to be able to manage disaster risk independently to avoid, control risks, reduce, and recover from the impact of disasters

Programme location :

- Pucung hamlet, Wukirsari village, Imogiri, Bantul regency, Yogyakarta with the threat of earthquakes and drought
- Gajihan hamlet, Pandes village, Wedi, Klaten regency, Central Java with earthquake threat
- Ngargomulyo village, Shaman District, Magelang regency, Central Java, with the threat of volcanic eruption

e. Diversification of revenue for community and social safety nets in areas prone to disasters

f. The establishment of a funding mechanism for disaster risk (disaster insurance)

Risk transfer as one of the efforts in the management developing more risk in developed countries. it is associated with the level of security or safety culture has grown well in line with the level of developed countries welfare demands that affect the level of assurance protection. However, with the increasing awareness of the rights and obligations of all actors countermeasures disaster in Indonesia as mandated in the Act No.. 24/2007, protection against catastrophic threats a right for citizens and the Government should be ensure the fulfillment of these rights through a variety of efforts management of these risks is through disaster insurance.

This discourse continues to roll over and be expected within the not so long through the guarantee of disaster insurance supported by the Government of Indonesia can be implemented.

g. Specific risk reduction and preparedness for women, children and marginalized groups

3.1.5. Disaster prevention and mitigation

a. Disaster risk mapping

In the framework realize the disaster risk reduction and to increase the capacity of disaster management providers in the area as well as providing a stock of knowledge in the mapping of the affected areas,

Data Information and Public Relations Center BNPB conducting Technical Guidance Geographic Information System (GIS) with the theme "Use of GIS Technology in Disaster Management" held on Banjarmasin, South Kalimantan regional agency for disaster management (BPBD)

BNPB provide GIS training to regional BPBD

b. Formulation of control policies on the control and management of natural resources with a potentially catastrophic
c. Formulation of policies on insightful environmental management of disaster risk
d. Monitoring and evaluation of regulations related to the management of environmental / natural resource oriented disaster risk
e. Determination of spatial and land-based disaster risk

Management of natural disasters can done to mitigate. Mitigation Disasters can be defined as "A series of efforts to reduce the risk disaster, either through physical development and awareness and increase ability to deal with the threat of disaster ".

Effort or activity in the prevention and mitigation are done aims to avoid the disasters and reduce risk caused by the disaster. Disaster mitigation is part of the implementation of disaster management in the

situation there is a potential disaster.

Disaster mitigation can be translated in the context of spatial planning as a tool to prevent / avoid / eliminate hazards (hazard), reduce vulnerability, and increase the resilience of an area / region tertentu.Implementasinya can be realized in the Spatial Plan are categorized as one means of mitigating passive disaster.passive disaster.

Some fundamental things in the arrangement of space-based mitigation natural disasters, which are as follows :

1. Spatial based recognition and understanding of disaster risk in the area that will be laid out so that the necessary zoning hazard.
2. Regulating the use of space that has hazards, through setting function space, building rules, restrictions on the use of
3. Development of a structure with respect to the needs of infrastructure / facilities supporting critical disaster-prone areas.
4. Provision of pathways and local evacuation and emergency assistance to anticipation of an emergency

f. Implementation of mitigation structural and non-structural

Structural mitigation efforts or actions are taken to reduce the risk of disasters by making structural or physical entity that can mitigate or reduce the threat to protect the public from the threat of natural disasters. Mitigation may be structural or physical bunker construction and installation of the early warning system.

Other structural mitigation efforts is to build a facility for the installation of warning sirens around the foot of Mount Merapi as an early warning system (EWS). Physical Mitigation is expected to serve as an emergency marker for people to be prepared when the threat comes arrived - arrived. If the EWS alarm sounds, people should leave the area of disaster preparedness Mount Merapi on safe radius set by the government.

Non-structural mitigation or nonphysical are efforts to increase the capacity of institutions and communities in order to have a reliable resource that is always ready, alert, and aware of the occurrence of natural disasters. In general, non-physical mitigation in the form of

socialization and training pre disaster

Non-physical mitigation in the form of socialization can also be used as awareness raising for the people living at the foot of Mount Merapi. This socialization may include transfer of knowledge and experience about the threat of hazards that may arise as a result of the natural geographical structure in which people live and settle. By knowing the nature and character of the residence, the community is expected to be ready and alert to any threat of natural disasters around the residence.

In addition to socialization, pre-disaster training for the communities around the base of Mount Merapi is also very necessary. Training can be either the introduction or initiation and early detection of threats that can arise from the Mount Merapi disaster. Communities also need to be given training and sufficient knowledge at this stage of evacuation procedures, management stretchers and tents, prep kitchen, refugee management, and coordination with the village government. All non-structural mitigation efforts are expected to bring awareness to the community about the importance of preparedness as a manifestation of efforts to minimize and anticipate the number of casualties in the event of a disaster.

g. Research and Development

ITB Disaster Mitigation Research Center is an organization under the framework of Research and Community Service Institute - Institut Teknologi Bandung which was formed in April 2011. Disaster Mitigation Research Center ITB was formed in the hope of a role in conducting research and activities to promote disaster mitigation in Indonesia with the support of various national and international organizations. Thus, this research centers can respond to the national need to reduce the impact of disasters as well as ongoing efforts to institutionalize and research activities and initiatives in the field of disaster mitigation has been done by ITB for twenty years back.

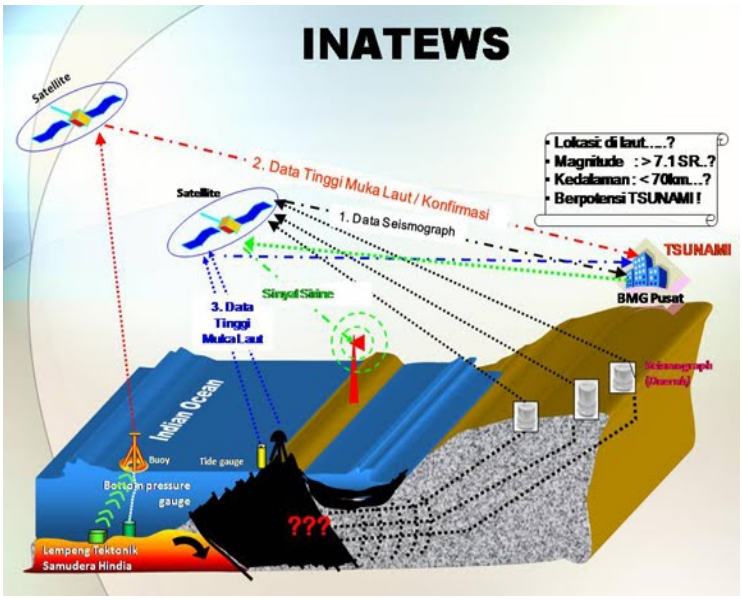
ITB Disaster Mitigation Research Center is expected to conduct research and development in the field of disaster mitigation for urban and rural areas through advocacy in support of strategic policy and legal mechanisms, identify and analyze the impact of disasters, disseminate and transfer knowledge and skills through training, workshops, seminars and research-based activities and based society.

3.1.6. Early warning System

a. Development of Early Warning System

As we all know, BMKG has established Indonesia Tsunami Early Warning System (InaTEWS) and they are committed also to support the multi-hazards and multi platform concept. As such, the BMKG is also releasing early warning information for weather and climate, in addition to earthquake and tsunami. It is also important to acknowledge that Indonesia Tsunami Early Warning System is serving not only nationally but also internationally as it covers three regions, namely the Indian Ocean, the Pacific and the South China Sea. As such, regional cooperation and partnership is critical to ensure that the system can be mutually benefitting all relevant countries.

There are four elements of early warning, namely, **risk knowledge**, **technical monitoring and warning service**, **communication and dissemination of warnings**, and **community response capability**. All these four elements must be presence in order to build an effective people-centered early warning system. BNPB, as the National Agency for Disaster Management, is mostly engaged with the response capability which aims to strengthen the ability of communities to respond to natural disasters through enhanced education of natural hazard risks, community participation and disaster preparedness .



INA Tsunami Early Warning System

There is no doubt that the ability for the community to understand the risks that they are posed with, are very critical. The community must respect the warning service

and know how to react to the warning signs. To build such capacity at the community level requires education and effective preparedness programmes.

At the national level, early warning systems for several types of hazards, such as earthquakes, tsunami, volcanic eruption, and floods are available and functioning, and have been disseminated to the communities at risk. Evaluation on the early warning system for several types of disasters in the community level has also been done professionally. This effort has been supported by experts from research institutions/universities/disaster studies, by adapting the early warning system to the development of the local situation and condition, as well as by taking the existing indigenous knowledge and culture into account. For instance, the early warning system developed by the community of Merapi Forum. However, in many other regions, due to the limited capacity of human resources, the response to the early warning system being advocated still requires to be upscale.

3.1.7. Preparedness

a. Strengthening National Disaster Rapid Response Assistance Eastern and Western region

This “stand-by-force”, currently known as Satuan Reaksi Cepat Penanggulangan Bencana (SRC-PB), will consist of knowledgeable and skilled personnel in disaster response from government and non-government institutions, as well as international organizations. Two based-operations for SRC-PB are in the process of being established, namely Jakarta to cover the western part of the country and Malang of East Java Province to cover the eastern part.

SRC-PB will perform multi-functions, such as management and liaising with relevant institutions, operation, planning, and coordination for logistics and humanitarian assistance movement, communication and information, as well as administration. The main objective of SRC-PB is to assist the local government of the affected area in the early phase of disaster response in undertaking the following activities: rapid assessment in timely manner; provide recommendation for the status/level of disaster; search, rescue and evacuation; provide basic

humanitarian needs; protect the vulnerable groups; recover the vital public facility and infrastructure.

INDRRA Disaster Drill

Effective emergency stand-by capacity is indeed a critical component of a preparedness system. As such, stand-by capacity should comprise of monitoring systems as well as human, physical, and logistics resources. The National Agency for Disaster Management (BNPB), as mandated by Law Number 24 Year 2007 on Disaster Management is committed to continuously and strategically strengthen the capacity of SRC-PB, which includes regular testing and updating based on lessons learned in responses or through simulation exercises. In fact, the first simulation exercise for SRC-PB will be undertaken on the 10th of December in Bengkulu.

Indonesia Disaster Rapid Response Assistance (SRC PB)

In this globalization era, it is very likely that the occurrence of a disaster in an area will bring an extensive impact that is beyond the boundaries of a State administration. Consequently, there is a need to gather joint efforts or solidarity in facing disasters. This humanitarian affair hardly recognizes the differences in ideology, and may even become means to bring peace and unity to the nation. As many other countries that had been struck by disasters with devastating impact, Indonesia has felt tremendous support and solidarity from various nations in facing the Tsunami in Aceh, the earthquake in Nias, Yogyakarta, as well as the one in West Sumatra that occurred in late September of this year.

b. International cooperation in improving preparedness and emergency response

We are certainly grateful for the continuous supports extended by the international communities, both through bilateral and multi-lateral cooperation, for strengthening the resilience, preparedness and capacities at local and national level. Being a disaster-prone country which also serves as a laboratory for disaster management, we earn numerous invaluable lessons learned and best practices from handling various disasters response and disaster risk reduction implementation.

We firmly believe that these lessons learnt and best practices are also benefitting the international community, including donors, in enhancing their support for strengthening the resilience, preparedness and capacities in other parts of the world.

One of the prominent challenges that we all have to be vigilant of is the moral phenomena of the affected population post the occurrence of disaster. External intervention should not bring adverse impact on the moral values of the affected population. When major disaster with devastating impact strikes, usually access to the affected areas becomes limited or even completely closed due to the damages caused by the disaster. This situation disturbs chains of logistics supply and eventually leads to imbalance supply and demands of resources within that affected areas and its surroundings. In such stage, various means may be explored to ensure the required resources become available so that humanitarian assistance can be provided on timely manner. However, thorough consideration must be taken into account to ensure that external intervention will not create dependency, nor will it disrupt the social and economic structure and value of the affected population.

Building partnership for better DM with other countries

Indonesia will maintain its commitment to strengthening its capacities and preparedness measures as part of our efforts in enhancing the resilience to disasters at national and local level.

Significant support from the international community has been benefitting not only for the Indonesian people but also globally. The strong partnership of the Government of Indonesia and its national and international partners has proven to be one of the key contributors to the significant milestones achieved within the last six years.

To date Indonesia has been active at the regional and international levels in promoting disaster risk reduction. Together with the other ASEAN countries, for instance, Indonesia is involved in the ASEAN Regional Programme on Disaster Management (ARPDM), a 2004-2010 cooperation framework to create a disaster resilient region. The programme has been enhanced by the ASEAN Agreement on Disaster Management and Emergency Response (AADMER). AIFDR Partnership programme fully supports and ensures the prominent role of Indonesia for the implementation of AADMER.

AMCDRR on Yogyakarta, October 2012

Lastly, it is our hope that with the support of AIFDR, we will establish a Center of Excellence for Disaster Management for the Asia and Pacific region. We trust that the establishment of this Center of Excellence will enhance not only the bilateral relationship between Indonesia and Australia, but it will also strengthen the partnership among DRR actors in this region. This cooperation is also expected to

continue until the ultimate goal is achieved, that is, to strengthen the DRR capacity of Asia Pacific region which can be reflected in the significant decrease of impacts on damages and losses, along with the resilience of people in this region against future disasters

c. Establishment of Rapid Response Assistance at the regional level
d. Provision and preparation of basic supply of goods
e. Provision of basic health
f. The provision of emergency shelter and temporary needs

In facing those challenges mentioned above, the Government of Indonesia has a vision, that is, to build the resilience of the nation. Currently, four different approaches are being utilized in enhancing the resilience, preparedness measures and capacities in disaster response. The first one is to intensively cultivate the

"anticipative approach" in facing the existing hazards. Anticipative approach such as further researches, studies and innovation that can be utilized to enhance the creation of early warning systems, innovation of temporary shelter using local/indigenous knowledge, law enforcement on the application of building codes, evacuation drills and simulation for communities, establishment of well-equipped crisis center, etc, must be encouraged. The community of Padang City, for example, has set an exemplary anticipative approach as they are able to use their own social capital in building temporary shelter in various places prone to tsunami. The National Agency for Disaster Management, with support from international community, is in the process of establishing twelve regional logistics depots that can also function as training center. Professional Indonesia Rapid Response Assistance (INDRRA), consist of personnel from various line ministries, military and police, as well as academician, has also been established for western and eastern regions.

g. Increased accessibility of airports and seaports in vulnerable areas to meet the standards of emergency
h. Improved communication and provision of access to data and real-time information for emergency response, development of information technology

Conditions disaster-prone on Klaten, making the Regency Klaten to procure the two-way radios or handy-talkies (HT) for the 26 district head

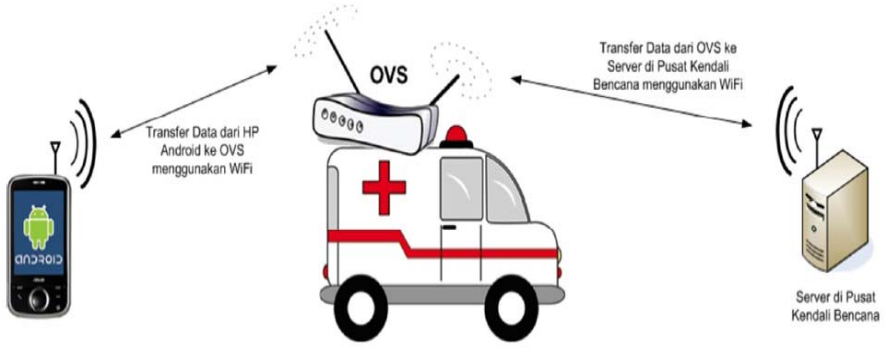
and 33 heads of Working Unit (SKPD). HT expected to be used to communicate in an emergency.

Klaten including disaster-prone areas, whether floods, hurricanes, landslides, earthquakes or volcanic eruptions. Handy-Talkies are very important for coordinating the event of any disaster and coordinating routine when the condition of peace.

Klaten classified the fourth rank the categories of Central Java disaster prone areas. Experience an earthquake, 2006, all communication devices can not be used, either mobile or landline phone. Thus, communication depends only on Handy-Talkies. Handy-Talkies did not know blank, mobile phone signal is very limited. If there is a threat of danger, just turned up the volume so that people could hear the Handy-Talkies.

Klaten're working to improve disaster preparedness. In the normal, Handy-Talkies may be used to report on. Later, the district head will be required to report the situation area every morning and afternoon. Could in time of emergency, they can use Handy-Talkies at any time to coordinate with relevant agencies.

Development cellular communication system emergency. When disasters occur, cellular networks infrastructure usually collapse for the minimum of one week. To enable the people to communicate using their mobile phones we propose emergency cellular network based on OpenBTS technology.



Data transferring flow

Due to heavy traffic when disasters happen, we make the network only serves Short Message Service to the people in disaster area.

Using this emergency networks people can share their position and condition. In addition, we also propose two rapid asessments application that can be used by first responder team member.

Both of the applications are implemented in Android-based mobile phones. The first application is for Disaster Victim Rapid Asessment. Using this application, the first responder team members can rapidly asses the victim's conditions. The results can be used by disaster mitigation management team to allocate medical supplies and resources even if the victims haven't arrived to the hospitals. The second application is for Damage Rapid Asessment. It can be used to assess the damage resulted by the disaster. The results can be used by disaster mitigation management team to calculate cost projection in after disaster recovery process. Both of the applications have been developed but the emergency cellular network is still in the early design phase.

i. Preparation of contingency plans

j. Improved counseling, training and emergency response mechanisms drills

Disaster Management Drill with Community,
others institutions on Central Sulawesi

Disaster Management evacuation drill

Disaster management emergency response drill

Palu is a seismic area that has a high tectonic activity of faults Palukoro that extends from the Makassar Strait to the north coast of the Gulf of Bone fracture with a length of 250 km. In the city of Palu, Palu fault crossing of the Gulf of entry into the mainland, cutting the heart. These active faults move at speeds up to 1.7 cm / year. On 01-12-1927 at 13:37 pm magnitude 6.5 earthquake and 15-meter tsunami triggered.

14 people died, 50 were injured, and hundreds of buildings destroyed. Also 1968 tsunami. Frequent tsunami, in the growing community of local wisdom with the term tsunami balumba bose (ocean waves), balumba latollu (wave three), lembo pounding, and Boombang Tellu.

On Friday (23/11/2012) in the field Talise Palu, BNPB conduct disaster drills involving various elements that exist. Rehearsal attended by 750 people from SRC PB actors, BPBDs, military, police, Tagana, National's SAR Institution, Health Department, Public Works, Local Governments, NGOs, international organizations, mass organizations, universities, public, school children, and others. Rehearsal aims to test the ability of disaster management, rescue and evacuation, emergency health, shelter, logistics, emergency repairs and community self evacuations.

In opening ceremony, Chief BNPB, Dr. Syamsul Maarif, MSi. said that, "Disaster management is local. means that every disaster in every region has different characteristics. handling disaster must be adjusted with the physical, economic, social and culture. Affairs disaster is shared between government affairs, public and business. We already know the hazards in Palu. society needs to be prepared preparedness. existing local wisdom tsunami in Palu as balumba bose and balumba latollu which means high waves after the earthquake, should be developed so that people can survive the tsunami. "

3.2. Disaster Risk Reduction in Japan

3.2.1. Disaster information system and Risk asessment

3.2.1. Disaster information system

Disaster information play important role in the disaster rescue. There is no accurate, timely and comprehensive disaster information, the government disaster control work will not be able to effectively carry out. Disasters governance requires the government must build the relevant aspects of information involving emergency incident management information network, the information from different processing systems into the same agencies and emergency command center and interact with each other, so that the agency can directly from the database and user access to data collected from the environment. Only authoritative information first-hand for the first time, the government was likely to be successful disaster relief. Japan is a model in

this regard, its core institutions developed network management and modern information technology makes efficient information transmission channels in disaster management.

A) The authority of unified information management agencies

Japan believes that the information can come from many different grassroots organizations, all information should go into a core of information management agency, and the agency is able to achieve a peacetime disasters quick disaster information acquisition, analysis, processing, and effective use of effective coordination of specific management department, disaster control. To this end, Japan has established in the Cabinet the Cabinet Intelligence survey room as the core information management agencies responsible for intelligence gathering, aggregation, analysis and comprehensive utilization of working to strengthen national disaster information centralized control.

The institution in the information management has a commanding height, the major responsibilities of the commander of the global: 1. Responsible for intelligence on the situation at home and abroad, the domestic and foreign media rhetoric, scholars have suggested that the collection, analysis, important content on a regular basis, or feel free to report to the Prime Minister and Chief Cabinet Secretary. 2. Coordination meeting regularly with relevant ministries and agencies held a joint intelligence collection, analysis.3. Responsible for the transmission of intelligence between the relevant ministries and agencies, with the prime minister's residence in the event of a large-scale disasters or emergencies, and collect relevant information from the public institutions of civil society needed.

The institutions set up Cabinet Intelligence summary center, multi-purpose satellite broadcast system is equipped with the latest technology, to prevent information leaks and outsiders sneak into the security of information systems, multimedia summary of national crises management information through multiple channels of information and communication systems to information and intelligence to strengthen the agency to collect, aggregate analysis capabilities. Through this agency, Japan paradigm to achieve unified management of disaster-related information on the different levels of government and relevant departments, departments cooperate with each other, the accuracy of the science of efficient communication of disaster

information as well as relief decisions.

B) Advanced information management organization

The reason why Japan disaster information system effective, advanced information management organization is another important factor, in addition to the authority and unified information management agencies contributed. In Japan, information management institutions to assist the authority to do disaster information collection, aggregation, analysis and comprehensive utilization, the establishment of advanced information management organizations from the central to local levels.

In the central government, the establishment of the Ministry of Land, Infrastructure and Transport Province and its outside, the Japan Meteorological Agency, fire agencies, the Joint Chiefs of Staff under the intelligence department and other information management organizations. As major disaster information management organizations, the Ministry of Land, Infrastructure and Transport, the Japan Meteorological Agency responsible for collecting, publishing and management of disaster information in disaster forecasting and disaster.

In addition to the central ministries and agencies have a set of intelligence information transmission system, the relevant government agencies and organizations, and the relevant departments of the local governments at all levels have set up their own disaster information transmission system. Tokyo Prefecture Disaster Countermeasures such as in the event of a disaster, the Tokyo Metropolitan Police Department, Fire Department, Department of Construction, Department of Education and other relevant departments through their own intelligence transmission system will collect disaster intelligence is directly transferred to the Tokyo Metropolitan Disaster Prevention Center the headquarters, disaster Response Headquarters then disaster intelligence analysis collate, draw the entire Tokyo Metropolitan affected.

C) Advanced information technology systems

Information technology support system is another strong pillar of Japan disaster information system with remarkable results, but also to achieve the protection of the emergency response linkage.

On the one hand, Japan has the world famous Phoenix Disaster Management System, including information network system, the release of environmental information phone system, disaster assessment systems, maps, information systems, disaster information systems, visual information systems, communications support system of disaster management, disaster response countermeasures support system functions software emergency system after receiving the alarm of the incident through a variety of systems to understand the incident had occurred, the type, level, the consequences need emergency information such as the type and quantity of the resource, and then quickly effective response.

On the other hand, digital, information, networking, and other high-tech features, the highly developed communications systems used in disaster management, disaster information system has a state-of-the-art technical support. For example, after the Great Hanshin Earthquake, Japan, has established a national disaster information network.

In addition to the country to establish a meteorological disaster prevention and intelligence, regional meteorological observations intelligence, river basin intelligence, road disaster intelligence system, flexible use of map information as well as GPS, GIS and CAD, RS and other technologies, these information systems to achieve fast and accurate reach to collect disaster information.

3.2.1. Disaster risk assessment

The scientific management of the disaster information cannot be separated from the hazard assessment. Leave the hazard assessment, the Government will not be screening the genuineness of the disaster information, the government disaster prevention, disaster relief, disaster reduction decision-making cannot guarantee the accuracy of the science. Disaster information and efficient operation, the protection of the government decision-making accuracy, timeliness, Japan established a disaster assessment mechanism.

1.Japan has a set of comprehensive disaster assessment background database. Japan disaster has occurred in the history of historical disaster statistics, historical disaster records document major historical disaster cases in the form established a complete historical background database, a detailed collection of Japan's history of previous

disasters, disaster, disaster situation disaster losses, the government disaster relief decision data, to help the government to determine the specific hazards in different regions of the disaster law and absorb the lessons of previous decision-making by the Government. Japan disaster prevention, disaster relief, mitigation spared prepared for the extensive collection of various regions in Japan terrain, socio-economic background, hydrological and meteorological characteristics of homes background and specific disaster-prone region specific background information, establish a thorough background disaster assessment database, and provide reference for the government to assess the situation.

2. Establishment of a rapid and effective disaster assessment model. With this model, the government is able to analyze and grasp of the extent of disasters, scope, size and loss mitigation to ensure timeliness and accuracy.

3. Establishment Disaster assessment expert system. Responsible for the disaster and major natural disasters trend in consultation with, and rushed to the disaster site disaster assessment. Such as towns, buildings and other infrastructure seismic experts responsible for the disaster-stricken town buildings and infrastructure damage assessment; disaster management and relief experts is responsible for property damage to the victims, the local Government disaster response capacity and disaster emergency management effectiveness, victims living conditions, relief needs for evaluation.

Similarly, the risk assessment is also the basis of the disaster warning. Disaster risk assessment has become an important basis for Japan to develop the urban disaster prevention plan and countermeasures, play an important role in the work of urban disaster prevention and mitigation. According to the Japan disaster prevention and mitigation planning requirements of the system, the main purpose of disaster risk assessment analysis of representative areas, disaster research and to determine disaster prevention urban plan representative areas and key areas of disaster prevention plan implementation of the recovery plan.

As required by law, at all levels of administrative regions in Japan through the various types of risk assessment methods to determine the degree of hazard. For doing the work of disaster risk assessment, the assessment and a local risk map identifies the earthquake, tsunami, volcanic eruptions, floods, landslides and other disaster-prone area, and indicate the appropriate emergency evacuation routes throughout Japan.

Geographical Survey Institute of Japan through various surveys, provide basic information to draw different types of major Japanese plains and surrounding areas and

active volcanoes risk maps. Some communities often organize community-based risk map design activities proposed countermeasures to cope with various disasters threatened to raise public awareness on the risk map.

For example, since 1975, the Tokyo local municipal assessment object classification assessment every five years by the risk of the building, the fire risk and the emergency shelter risk, draw around risk, as a the basis for the preparation of disaster prevention and mitigation plans and contingency plans. In February 2008, Tokyo released the 6th comprehensive risk assessment results including Tokyo 5099 municipal.

Case research 2: the hazard map in Japan

Japanese municipalities generally create and distribute hazard maps that show the area most

vulnerable to earthquakes, tsunamis, volcanic eruptions, floods, and landslides, as well as evacuation information. The Geographical Survey Institute (GSI) conducts surveys that provide basic information for the creation of various types of hazard maps for the major Japanese plains and surrounding areas, and for active volcanoes. It creates thematic maps, such as topographical maps showing geographical information relevant for disaster reduction, and compiles statistical data.

Flood Hazard Map

To ensure that residents know the flood risk in advance and can take prompt and appropriate evacuation measures in the case of a disaster, the MLIT and prefectural governments (which are

responsible for managing rivers) identify flood hazard areas along rivers designated for flood forecasting and water level reporting activities, based on flood simulations using the planned rainfall for those rivers. Municipalities that contain areas where flooding from rivers is expected to occur are creating flood hazard maps that include such information as flood hazard areas and probable water depths (provided by river managers), evacuation sites, and flood forecast communication methods. Municipalities are working to distribute their flood hazard maps by displaying and distributing them at government offices, distributing them to individual homes, displaying them at civic halls and hospitals, publishing them in newsletters, on websites, and in

phone directories, conducting evacuation drills using the hazard maps, using them as teaching materials in elementary and junior high schools, and holding community meetings about them.

Tsunami Hazard Map

In the event of a massive trench earthquake such as those which are feared to be imminent in the Tokai region and the Tonankai/Nankai regions, the national government estimates that normous damage will be sustained from the resulting local tsunami. To mitigate such tsunami damage, efforts must be made to develop technologies for even more rapidly issuing tsunami early warning information, and to raise awareness of the tsunami damage risks at the individual and community level so that warning information will be used appropriately by residents for evacuation. The national government has set a goal of having tsunami hazard maps created for all municipalities that need to implement tsunami disaster reduction measures. To this end, it investigated several issues with regard to supporting the creation and use of hazard maps by local government bodies, and created a tsunami hazard map manual in 2004. Also, to mitigate tsunami damage along the coast, the Japan Coast Guard is performing calculations for the tsunamis that would likely be generated by the kind of massive earthquakes believed to be imminent, and is working on developing tsunami disaster reduction information diagrams that map those results.

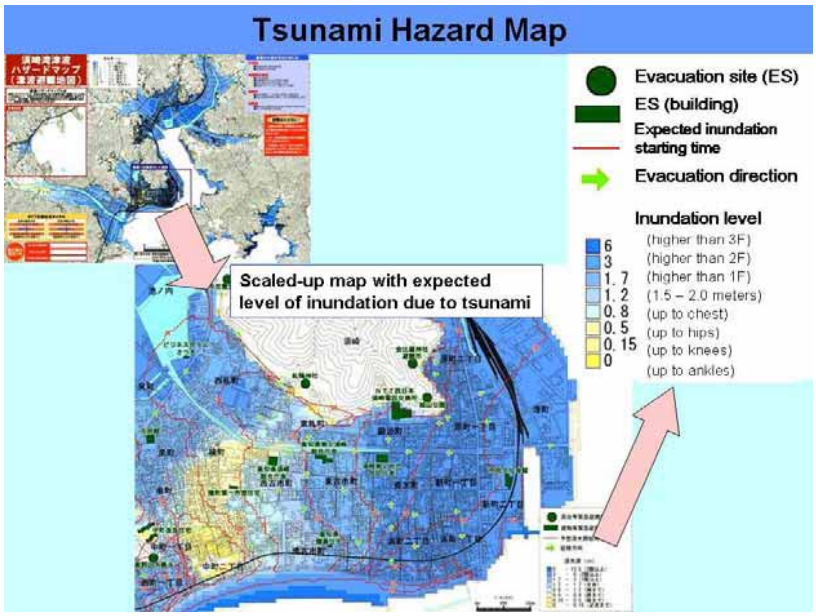


Image 6 Tsunami Hazard Map

Earthquake Hazard Map

Japanese government also created Earthquake Hazard Map, in case of Chiyoda-ku, Tokyo seismic hazard map, clearly marked above 7,6 6 weak earthquake affected area housing collapse of the region's risk, the risk of fire, emergency transportation roads, shelter and other information clearly marked, the local people can clearly understand the risk of the region where, where security. This greatly increases the chance of

survival of the people after disasters.

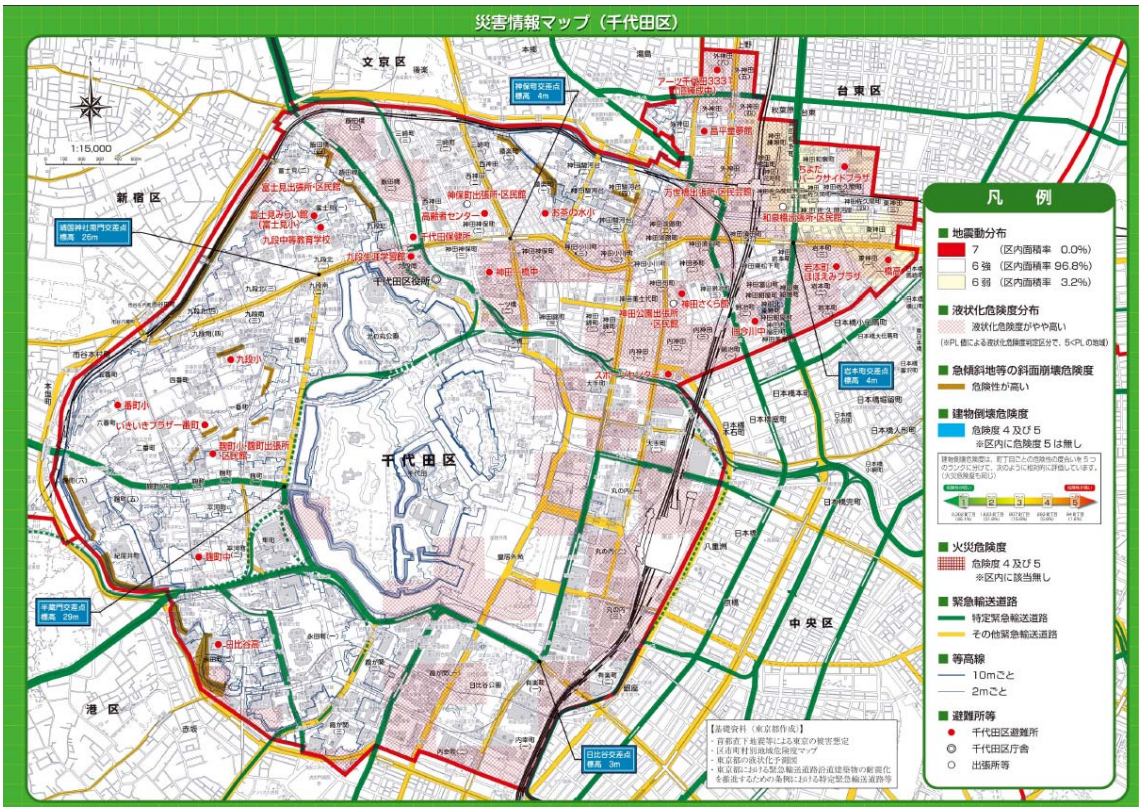


Image 8 earthquake Hazard Map in Chiyo

Volcano Hazard Map

Creating volcano hazard maps that take into account the activity patterns of each volcano and the particular disaster hazards of a specific location is an effective way to ensure that residents are prepared to take prompt and appropriate evacuation actions based on volcano early warning information. Volcano hazard maps are useful for raising the disaster reduction awareness of people who live near volcanoes, facilitating the formulation of suitable disaster reduction plans by local government bodies, and encouraging appropriate land use. The creation of these maps is being promoted primarily by relevant local government bodies, with the technical support and cooperation of the national government, and they are currently available for 37 volcanoes.

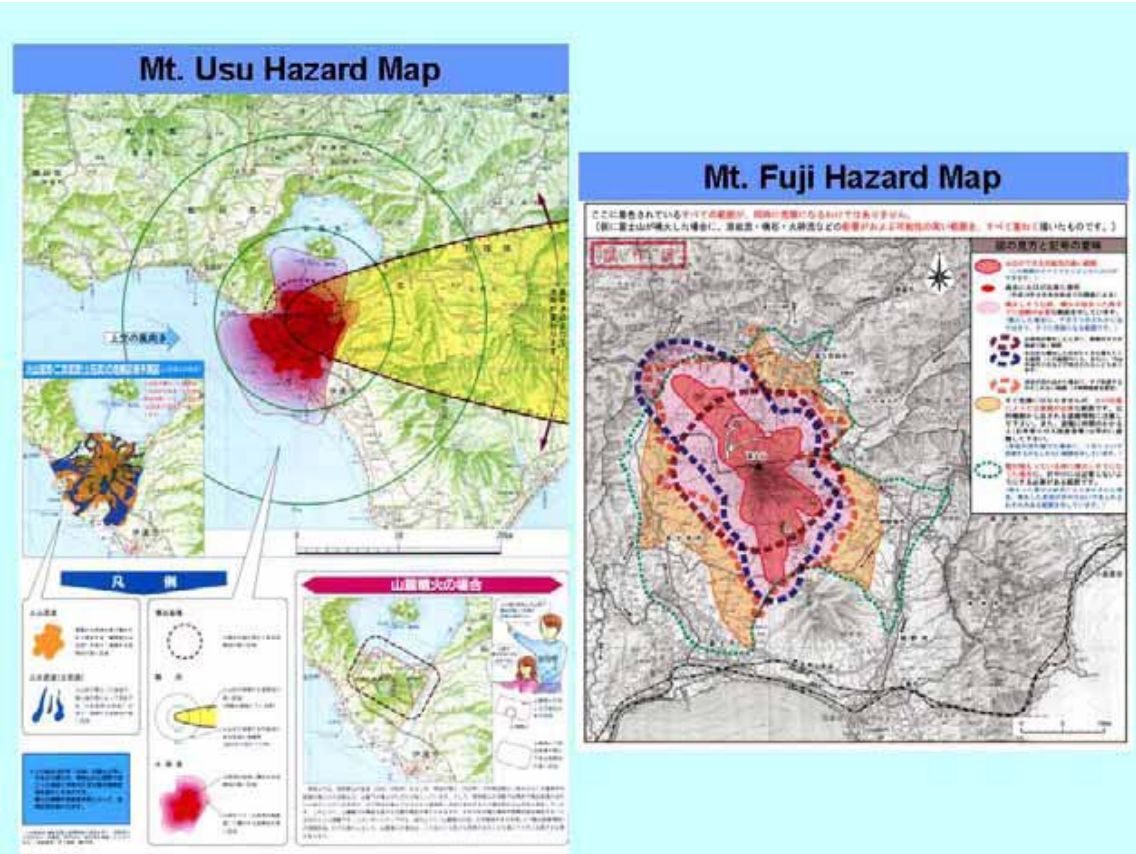


Image 8 Volcano Hazard Map

3.2.2 Disaster early warning

3.2.2.1. Disaster early warning profile

Monitoring and early warning process and the behavior of the government to effectively prevent and respond to emergencies, identification, analysis and assessment of various risks, timely posted to the relevant personnel and regional hazard warning.

The goal of the monitoring and early warning is to strengthen the study of the occurrence and development of all types of emergencies and derivative law, to improve the information network, to improve monitoring and early warning level, and to ensure that the potential risks early discovery, early reporting, early.

Early warning including monitoring and warning.

Monitoring is the scientific method to collect major hazard, hazardous area, the spatial distribution of the critical infrastructure and important protection goals, information about the health and social security situation, and close monitoring of the various factors that may cause emergencies, to collect information about risks, grasp the changes first-hand information of the risks and emergencies, and to provide important information on the

basis of scientific early warning and take timely and effective measures.
The warning is based on unexpected events past and present data, information and materials, use logical reasoning and scientific forecasting methods and techniques, the risk factors that may arise in the future, the development trend and evolution to make estimates and inference. Issued the exact warning information, the government and the public to understand the trend of developments in advance, in order to take timely coping strategies to prevent or eliminate the adverse consequences of a series of activities.

Fundamentally speaking, the monitoring and early warning is based on historical data and real data to predict the future, the management department of timely, accurate grasp of the current situation and the future, be aware, and to make early arrangements. Monitoring for early warning service, is the basis and premise of the warning. The monitoring focus more on the long-term, continuous primary data collection process, is a normal behavior. The warning is monitoring based on advance warning prior forecast danger that may occur in the future, through a variety of warning channels, drew the attention of the relevant parties.

3.2.2.2 Disaster early warning system

Japan is a country prone to earthquakes, tsunamis, volcanoes and other natural disasters. On the basis of previous disasters, the lessons learned, the Japanese gradually establish and improve a set of strict disaster warning mechanism.

A) Meticulous Structure for monitoring to Various Disasters

To issue early warning information regarding earthquakes, tsunamis, volcanic eruptions, and severe weather disasters that is useful to the disaster reduction activities of residents and disaster management organizations, and to thereby mitigate disaster-related damage, it is essential that efforts be made to develop and strengthen the monitoring systems that provide accurate, real-time information about these phenomena, and that those systems be maintained and managed appropriately. In Japan, organizations involved in disaster reduction, especially the Japan Meteorological Agency (JMA), use 24-hour systems to carefully monitor various natural phenomena and weather conditions.

The JMA has developed a system called the Computer System for Meteorological Services (COSMETS). It uses a telephone-line-based weather information transmission

system to collect observation data and disseminate information, and a super computer system to conduct analyses and make predictions. The JMA serves as the telecommunications hub for the Global Telecommunication System (GTS) that is being operated cooperatively by weather organizations worldwide, and thus is also exchanging observation data with other relevant nations.

B) Earthquakes and Tsunamis monitoring

The national government, local governments, and research organizations have installed seismometers, seismic intensity meters, and tsunami monitoring facilities throughout the country, and the JMA collects this observation data to monitor seismic activity and tsunamis.

C)Vulcanic monitoring

The JMA has installed seismometers and other volcano observation equipment at 30 of the most active of Japan's 108 volcanoes. It also has a 24-hour system for collecting and monitoring data, including the data from observation equipment installed by other relevant organizations, at its four Volcano Observations and Information Centers. The JMA routinely patrols other active volcanoes to check their activity status. If any abnormalities are detected, observations of the site are stepped up through the installation of observation equipment that can be monitored in real time. University and other research institutions are promoting volcanic eruption research through everyday observations of 36 active volcanoes.

3.2.2.3. Flood early warning

A) Flood Monitoring

The MLIT and prefectural governments observe the rainfall and water level in the rivers that they manage for disaster reduction monitoring purposes. The MLIT assesses the rainfall situation (distribution and strength) throughout Japan for the rivers managed by the national government from 26 radar rainfall observation stations nationwide. It also conducts observations at about 2,500 rainfall observation stations and about 2,000 water level observation stations all over Japan using visual observation methods, mechanical observation equipment, and a wireless telemeter system that transmits automatically observed data from remote locations.

B) Flood early warning

Hazard zones have been designated for those rivers deemed important to disaster

reduction, and the MLIT or prefectural government, whichever manages each river, works with the JMA to issue forecasts regarding flooding. The JMA handles the water conditions (rainfall, snow melt) while the MLIT or prefectural government handles the water situation (river water levels and flow volumes). By working closely together, they can issue flood forecasts that include predictions of future rainfall, water levels, and flow volumes. This information is communicated to residents via the municipal flood prevention management entities that conduct flood prevention activities (flood prevention corps), and via the media.

C) Flood Prevention Warnings

Flood prevention warnings are issued for the purpose of enabling river managers to provide guidelines for activity preparations and deployment to municipal flood prevention management entities and other organizations involved in flood prevention. When serious flood damage is expected to occur along a river, the MLIT or prefectural government responsible for that river designates hazard zones and issues flood prevention warnings when the water level rises to the pre-designated water level (preparations for flood prevention activities) or the warning water level (implementation of flood prevention activities).

3.2.2.4 Earthquake early warning

A)Earthquake Observations

To quickly locate the hypocenter and estimate the magnitude of an earthquake after it occurs and to promptly issue tsunami forecasts, the JMA has installed seismometers at about 180 sites nationwide (approximately every 60 km). It also constantly monitors seismic activity by collecting observation data from online data sources, including high-sensitivity seismometers used by research institutions. The JMA issues seismic intensity information for a total of approximately 3,900 locations nationwide. To do this, it uses data from its own seismic intensity
meters, installed at about 600 sites nationwide (approximately every 20 km) to measure the intensity of ground motion, as well as data from seismic intensity meters installed by local governments at about 2,800 sites, and data from strong-motion seismographs installed by the National Research Institute for Earth Science and Natural Disaster Prevention (NIED) at about 470 of its approximately 1,000 strong-motion seismic observation (K-NET) facilities.

In addition, to gain a more thorough understanding of earthquakes and crustal activities and to provide basic observations for survey research, earthquake observations are

conducted using high-sensitivity seismometers and broadband seismometers through partnerships with relevant research institutions such as the NIED, in accordance with the guidelines of the national government's Headquarters for Earthquake Research Promotion. The Geographical Survey Institute (GSI) has set up about 1,200 GPS stations all over Japan to form the GPS Earth Observation NET work, which it uses to monitor and analyze crustal movements based on regular field measurement data. These observation data are shared with relevant organizations.

B)Issuance of Earthquake Information

As soon as an earthquake occurs in or around Japan, the JMA analyzes the data from various seismometers and seismic intensity meters. Within about two minutes, it issues a "seismic intensity information" report for earthquakes of intensity 3 or greater, and within five minutes issues an "earthquake information" report indicating the hypocenter and magnitude of the earthquake, and the seismic intensity in the municipalities where strong shaking was observed.

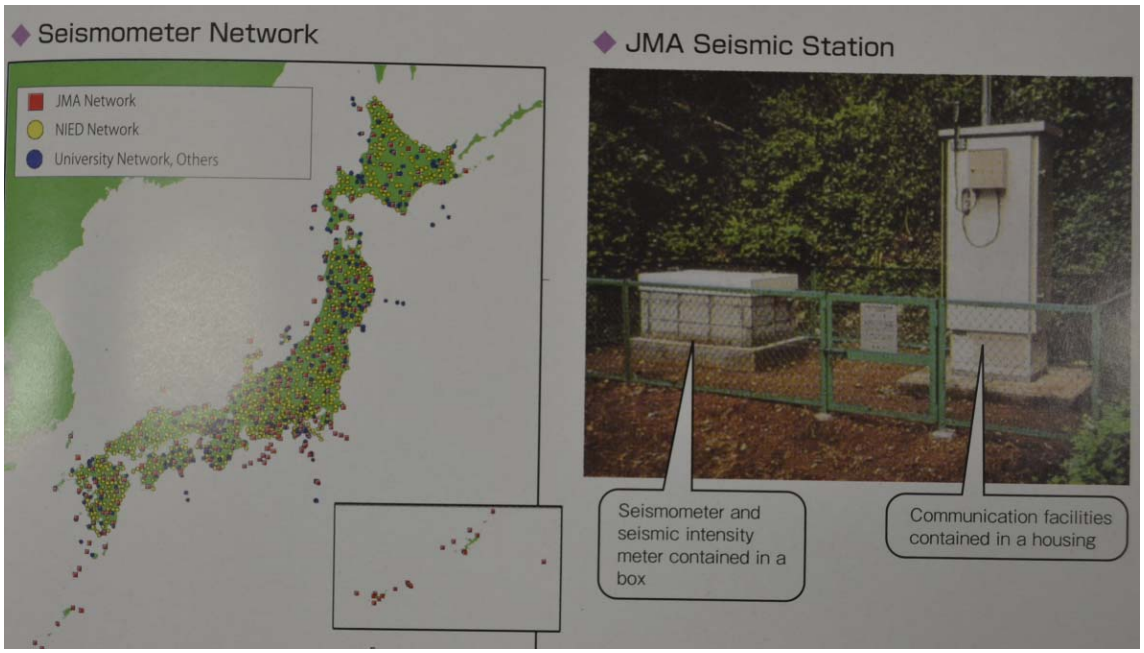


Image 9 JMA Seismic Station

3.2.2.5. Tsunami early warning

Most of the tsunami damage in Japan has been caused by "local tsunamis" which were generated by earthquakes near the coast and made landfall within only several minutes to several tens of minutes after the earthquake. Because of this, tsunami early warnings

require the
development of data analysis and transmission systems that can operate in extremely short periods of time.

The JMA conducts tsunami observations at 100 sites nationwide, including about 70 of its own
facilities as well as observation facilities installed by such organizations as the Japan Coast Guard and local government bodies. The Port and Airport Research Institute and the University of Tokyo Earthquake Research Institute have jointly installed GPS tide gauges 13 km off the
Cape of Muroto and are conducting demonstration experiments using those gauges. After an earthquake generated along the Pacific coast in September 2004, a tsunami with a height of 10 cm was observed.

When a large earthquake with the potential to cause a tsunami occurs, the JMA selects a corresponding scenario from the "tsunami database," which stores estimates of the tsunami height along the coast and the time it will take to reach shore. Tsunami forecasts can then be made based on this information. When a tsunami is expected to cause coastal damage, the JMA issues a tsunami warning or advisory within about three minutes after the earthquake and then follows up with announcements about the estimated height and arrival time of the tsunami.
Tsunami advisories are issued when estimates indicate a tsunami wave height of about 0.5 m, while tsunami warnings are issued for wave heights of 2 m. Major tsunami warnings are issued for wave heights of 3 m or higher. The tsunami warnings are transmitted immediately to disaster management organizations and media outlets using the Information Network for Disaster Prevention and satellite systems. The warnings are then forwarded to residents.

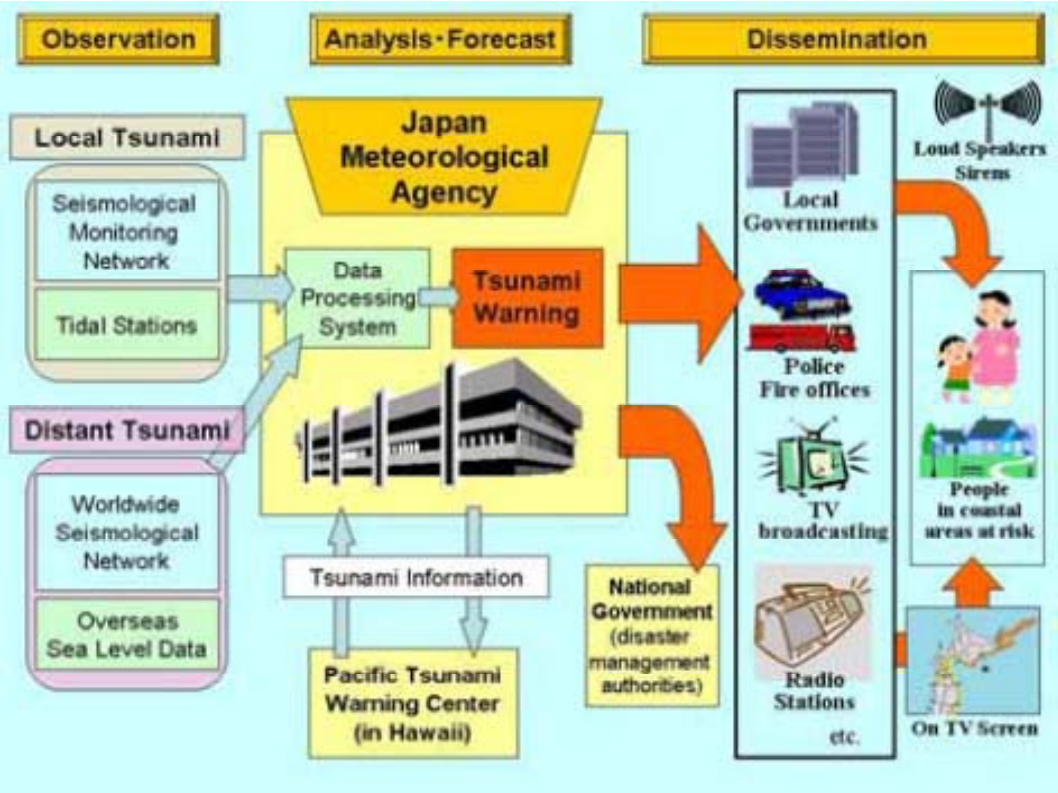


Image 10 Tsunami early warning

Case research 3: Utilization of Earthquake Early Warnings An earthquake early warning (EEW)

Utilization of Earthquake Early Warnings An earthquake early warning (EEW) announces the estimated arrival time of the S-wave of the earthquake and seismic intensity in each region. This
information is based on the estimated hypocenter and magnitude of the earthquake quickly calculated from the P-wave data obtained at seismic stations near the epicenter. (The P-wave is a longitudinal wave that propagates 6-7 km/s through the earth's crust, while the S-wave is a transverse wave that propagates 3.5-4 km/s through the earth's crust, arriving later and causing the more severely destructive phenomena.) The time lag between the P-wave and the S-wave can make it possible to mitigate earthquake damage by enabling disaster prevention actions to be taken before the major shaking begins (when the S-wave arrives).

Currently the JMA provisionally provides EEWs to a limited number of organizations, such as railroad companies, construction companies, and local governments using data from its own seismometers specially designed for the EEW throughout Japan and from

the high-sensitivity earthquake observation network (Hi-net) stations installed by the NIED in 700 locations nationwide. The elapsed time between the issuance of the EEW and the start of major shaking will differ significantly depending on a location's distance from the epicenter. EEWs may not be issued in time to areas located just above the hypocenter of an inland earthquake. However, when a large earthquake occurs near an ocean trench, there may be a time lag, albeit a very short one (ten seconds to several tens of seconds), between the issuance of the EEW and the start of severe shaking. This may be just enough time to mitigate damage by triggering emergency stops on trains, plant operations, and elevators, or even just by allowing people to take basic risk-reduction actions, such as extinguishing flames or taking cover under a desk.

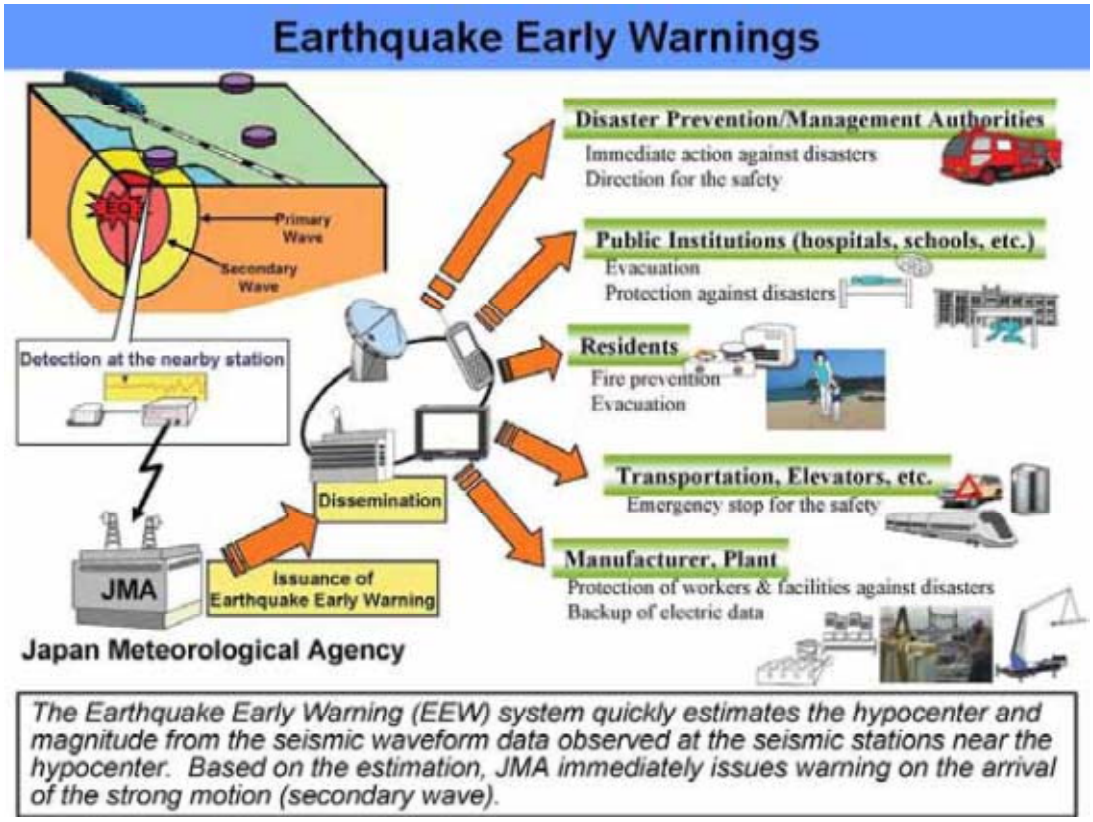


Image 11 earthquake early warning

3.2.3. Disaster reduction and prevention project

3.2.3.1 Improvement of disaster prevention facilities

Disaster management activities quickly and efficiently and the continue improvement of disaster prevention measures and equipment that including the observation equipment, materials and equipment needed in the emergency response, the emergency intelligence liaison and communication systems, transportation facilities, shelter and the

path of the facilities, the facilities of the disaster countermeasures headquarters.

Japan most of the area are built or under construction, disaster prevention base this disaster prevention facilities in peacetime as parks, stadiums, disaster prevention and education base, as well as material reserves base can be immediately converted to refuge in emergency disasters the place can be used as an emergency command center, material deployment center, medical security center has become important disaster preparedness base.

In addition, for this type of high-risk urban area, Japan is promoting preparedness such as the establishment of green space, implementation of seismic inspection and reinforcement of existing buildings, improvement and inspection of public facilities and earthquake disaster prevention measures lifeline facilities, in order to try to reduce the population and threats to wealth was concentrated in the urban areas.

3.2.3.2 Construction of disaster prevention projects

Improve the ecological environment, intensify the construction of disaster prevention projects is an important foundation for the work of disaster prevention and mitigation.

Japan has promoted Homeland preservation carried out a long time a large-scale survey activities, and developed such as watershed conservation, flood cause of coastal engineering steep collapse Countermeasures career, sewer system transformation, land improvements, such as medium-term or long-term plans, and proposed and is propulsion more land preservation advancing the project.

Case research 4: soil erosion control dam (prevent debris flow)

Part of soil, stone and gravel making up a hillside and river bed is intermingled with water from long-continuing or localized rainfall, becomes slushy like porridge and is carried downstream at a dash. The flow is called a “debris flow”.

A Sabo dam stop s the flow of a lot of mud and rocks that may cause a disaster, and then carries them downstream slowly and safely.

Sabo dam as preventive measures against debris flows Sabo dams built in the upstream areas of mountain streams accumulate sediment and suppress production and flow of sediment. Those built at the exits of valleys work as a direct barrier to a

debris flow which has occurred. A sabo dam with slits is particularly effective in capturing a debris flow because it has a larger capacity of sand pool under normal conditions. In case that there is a fear of flow-down of driftwood, a slit sabo dam is built as a preventive measure.

Image 12 Sabo dam

the dam allows sediment to flow down-stream under normal conditions. when a large scale debris flow occurs, sediment is captured and temporarily held here to prevent disasters in downstream areas.

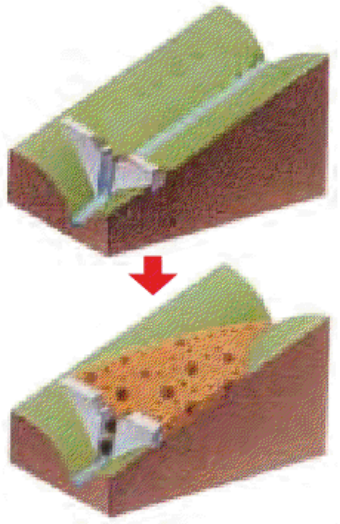


Image 13 Sabo dam Principle of operation

Case research 5: seawall in Japan (prevent tsunami and typhoon)

Japan have at least 43 per cent of Japan's 35,500 kilometres coastline is lined with concrete seawalls or other structures designed to protect the country against typhoons and tsunamis.

The design and type of a seawall varies depending on unique aspects specific to each location, and the erosional processes and environment which they are placed in. There are three main types of seawalls: vertical; curved or stepped; and mounds.

A) Vertical seawalls are built in particularly exposed situations. These reflect wave energy and, under storm conditions, standing waves (clapotis) will develop. In some cases piles are placed in front of the wall to lessen wave energy slightly.
B) Curved seawalls are designed to enable waves to break to dissipate wave energy and to repel waves back to the sea. The curve can also prevent the wave overtopping the wall and provides additional protection for the toe of the wall.
C) Mound-type structures are used in less demanding settings where lower energy erosional processes operate. The least exposed sites involve the lowest-cost bulkheads and revetments of sand bags or geotextiles. These serve to armour the shore and

minimise erosion and may be either watertight or porous, which allows water to filter through after the wave energy has been dissipated

Image 14 Seawall in wakayama

Case research 6: Miki Earthquake Disaster Memorial Park

The park is ordinarily used for sports and recreation as well as for disaster prevention education and training of personnel. In the event of a major disaster, it will support afflicted areas in the prefecture as a core facility of the regional emergency management base network for the entire prefecture.

In the event of a disaster, this will become a base for collecting relief supplies. The approximately 5,000 square meters of space below the stands are used for storage.

Different facilities have different functions in event of disaster. For example, athletics

stadium responsible for supply base, baseball stadium responsible for temporary heliport, gymnasium responsible for supply base, tennis courts responsible for assembly and accommodation of emergency relief workers.

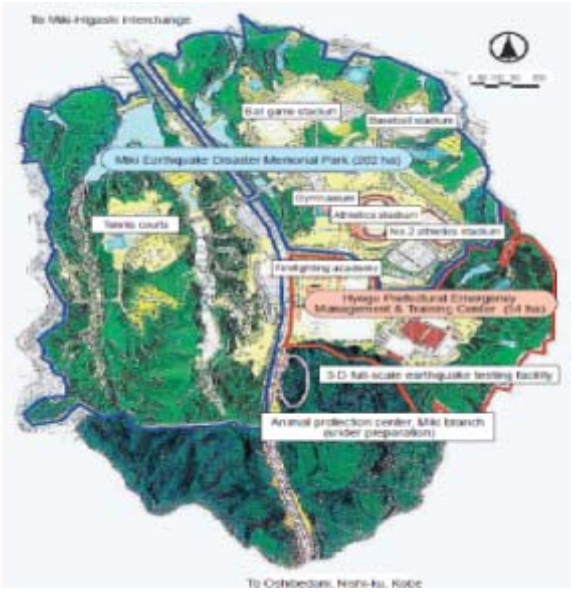


Image 15 Miki Earthquake Disaster Memorial Park

3.2.4. Disaster reduction activity

In order to promote disaster reduction activities, need the cooperation of every citizen, the citizen should understand the importance of disaster reduction, therefore, through a variety of disaster reduction activities, citizens mitigation concerns.

Japan Disaster Prevention Day on September 1, Disaster Prevention Week from August 30 to September 5, the central and local governments are usually a series of activities, such as disaster prevention and exhibitions, disaster prevention seminars and disaster drills race.

In addition, the Disaster Management and Volunteer Day January 17, and disaster management volunteers Week, January 15-21, to carry out a series of promotion of volunteer activities and local disaster management promotion activities.

3.2.4.1. Disaster drill

In order to make sure that every department of disaster management system in disasters quickly and effectively carry out a variety of activities established, as well as

the public have the right disaster the corresponding consciousness and knowledge. Japan has carried out wide-ranging and in-depth disaster prevention training and exercises. Disaster prevention training and drill has become an important part of Japan's disaster preparedness. Public through participation in disaster management training or on TV-related activities, there are more opportunities to reach out and think about disaster management.

In recent years, some of the actual disaster prevention training methods were introduced, such as role-playing exercises, prior to any relevant information to the participants in such drills, participants must make a judgment based on the information in the training process and the response. September 1 Disaster Prevention Day, the government and related institutions co-organize large-scale disaster prevention drills throughout Japan. In addition, throughout the whole year on regular basis will be held on the basis of historical disasters disaster prevention drill.

Disaster prevention training and drills in Japan can be said to be a regular activity, whether it is for disaster management professionals, or the general public, the business sector, etc. are a regular or occasional disaster preparedness training and drills, the disaster prevention training and drills has become an important way to one of ordinary Japanese disaster prevention knowledge and education in Japan.

3.2.4.2. Disaster Volunteer Training

Japan's disaster volunteer training has become one of the important aspects of disaster reduction activities in Japan. When disaster occurs, local residents take the initiative to take action, fire fighting, flood fighting, search and rescue, refuge effectively is very important to help the disaster management activities. Therefore, the establishment of voluntary organization of the local disaster management aware of the residents of the importance of community solidarity, these organizations are generally equipped with appropriate materials and equipment, disaster management training on a regular basis.

According to statistics, more than 50% of Japanese households to participate in the local disaster management volunteer organization involved in disaster relief volunteers around $ 130 million in the 1995 Hanshin earthquake. These groups, the central government and local governments are encouraged to disseminate relevant information through public relations and education to create a good learning environment, and its base of preparatory activities to promote the development of support organizations and volunteer activities.

3.2.5. Disaster education and research

3.2.5.1. Disaster education

Japan gave me the most impressive is Japan's disaster prevention education has been deeply integrated into the daily life of the Japanese people. Of course, this because high-frequency earthquakes, typhoons and other disasters, but also shows that the Japanese government and people to the positive attitude towards learning how to respond to natural disasters.

Japan's disaster management work is very important aspect to the lives of ordinary people through a variety of ways to enter into the unusual social life.

A）Variety of disaster Museum

In Japan, on the one hand, due to too many losses of natural disasters, on the one hand, but also conform to the needs of disaster management. Japan has established a large number of disaster museums.

Asian Disaster Reduction Center located in Japan's Hyogo Prefecture, the area is the 1995 Great Hanshin-Awaji earthquake affected areas, the Asian Disaster Reduction Center where the office building of the Great Hanshin-Awaji Earthquake Memorial neighbors, exhibited a lot of kind data. There will be a lot of visitors in Museum opening hours, including students and the elderly by organization and school.

Many disaster Museum are established to commemorate the earthquake and disaster prevention projects built after the 1995 Great Hanshin-Awaji earthquake, not only as a memorial stadium, has also become important disaster prevention publicity and education base.

Image 17 Variety of disaster Museum

B）Variety of disaster prevention and education publicity materials

In Japan, whether visiting the disaster prevention facilities, or visit some of the disaster management agency, to participate in a number of disaster prevention activities can be exposed to a lot of disaster prevention and publicity materials.

Public disaster manual is a very typical example, the manual describes the common local disaster and its victims in disaster prevention and self-help method, generally have several languages such as Japanese, English, Chinese and Korean. Many disaster management agencies have own characteristics promotional materials, such as newspapers, magazines, and manuals.

Japan's disaster prevention publicity materials a great feature is the use of cartoon image to explain the instructions, in such a lively, user-friendly form of disaster prevention knowledge to the general public popularity, especially for primary and secondary students, more quickly accept this kind of disaster risk reduction education.

Image 18 Public disaster manual

C）Education and promotion of universal Internet Disaster Reduction

Powerful resources of the Internet in today's information age, the Internet is widely used in all walks of life, that the areas of disaster prevention in Japan is no exception. Japan

disaster management department and relevant departments have established a dedicated website or web page as the propaganda disaster prevention knowledge and dissemination of disaster information platform. Disaster preparedness is an important topic in the official website of the central government and local governments in Japan and around the disaster plan, disaster prevention and disaster map information can be found on such sites. Professional departments also have their own disaster plan on its website is very easy to access.

Japan weather forecast page is a comprehensive disaster information publishing platform, contains meteorological information to the earthquake, volcanic eruption, marine disasters, disaster information and early warning information. The general public can be very convenient inspection, as an essential reference for daily life.

3.2.6. Disaster research

Japan attaches great importance to disaster prevention and research and development, the government and some public bodies are specialized research institutions, the focus of its research and development include the following aspects:

1. Mechanism of abnormal phenomena of natural disasters as well as forecast technology.
2. Earthquake rapid response system, such as the earthquake management information systems, emergency medical, life-saving systems.
3. High degree of concentration in urban areas to reduce catastrophic losses Countermeasures.
4. Hub functions, cultural facilities, science and technology and research facilities protection system.
5. Disaster management support system.
6. Advanced road traffic system.
7. Road, sea, air traffic safety countermeasures.
8. Social infrastructure aging countermeasures.
9. The harmful hazardous material security countermeasures and social crime.

Case research 8: Nojima Fault Museum in Hyogo Prefecture

Nojima Fault Preservation Museum is located in Awaji city in Awaji Island. It is near the northwest coast of the island, and is located about 10 km southwest of the north end of the island.


The Great Hanshin Earthquake occured at 5:46 a.m. on January 17th, 1995. It caused considerable damage mainly in the south part of Hyogo Prefecture. The earthquake caused 6,434 deaths and injured 43,792 people. And about 640 thousand houses was destroyed. The number of deaths was the highest since in the postwar period. It was centered at the north end of Awaji Island, at a depth of 16 kilometers. It had the magnitude of 7.3 (Japan Meteorological Agency scale). An active fault runs from the northwest coast, through Kobe city, to Itami city at the north of Osaka city. Because the fault shifted, this great earthquake was occured. When the earthquake occured, the real fault appeared on the surface of the ground at Nojima district in Awaji city. Two parts of

the ground slipped about 1-2 meters each other, and one part raised 0.5-1.2 meters. Then this fault was designated as a natural monument. And the museum has been built on a part of the fault.

In the museum, we can see the real fault about 140 meters long. And many photos and restored models about the earthquake are displayed. Additionally, we can experience the same quake as the Great Hanshin Earthquake in a model room.

Case research 9: Community-Based Disaster Reduction Activities (use Hazard map)

Community-Based Disaster Reduction education is very important. Hazard maps are designed to ensure that the residents who use them better understand the hazards in their area and will take the appropriate actions when a disaster strikes. The maps are

useless, however, if people do not know they are available. Some communities therefore organize activities designed to increase public understanding of hazard maps and activities to create community-based disaster reduction maps. These include "town watching" activities in which people actually go around the town they live in and identify its disaster risks, and workshops on disaster reduction. Such activities raise local residents' awareness of disasters and disaster reduction, lead to suggestions for improving the community's vulnerabilities, and contribute significantly to improving the disaster reduction capabilities of the community.

Image 19 Hazard map Activities

Conclusion and Lesson learning

Indonesia is one country that is frequently hit by disasters, whether natural, social and non-natural. This disaster has been a good lesson for the Indonesian government, the public, the business community college funding. All elements of society must unite with each other to realize the nation's face of disaster resilience. Steps can be performed in towards face of disaster resilient nation that is, institutional revitalization, social resilience, economic resilience and toughness and technology

During January 2013, BNPB recorded 119 disasters occurred in Indonesia. This is the data while considering the catastrophic events have all been reported to BNPB. Of 119 disasters caused 126 people dead, 113,747 people suffer

and displaced, 940 houses damaged, 2.717 houses were damaged, 10,945 houses with minor damage, and damage to public facilities.

Approximately 96 percent of disasters is still dominated by hydro-meteorological disasters such as floods, landslides, cyclones, tidal waves, floods and landslides.

With the enhancement of economic and social development and human activities, the loss of the natural disasters in order to faster growth. At present, Indonesia has made in disaster information management a series of progress, but there are still many shortcomings, especially in the face of the catastrophe of inadequate preparation, Indonesia can learn a lot of experience in Japan.

A. Realising a resilient nations and communities face of disaster is certainly a long-term process, synergy between generations and the need to continuously between Governments, communities and businesses. Role BNPB and BPBD be a central key in achieving the noble vision. Because according to the function is as coordination, command and implementing the humanitarian tasks in the response disasters require cooperation with various sectors. All requires time, commitment and hard work. Without it we only will be facing a disaster. Learnt from Japan, Japan has a high public **dedication, trust, loyal and obedient** to the government so that they are ready to work together to face disasters especially Japan also have people who have **mentally hard, never give up and complain** to the circumstances, Japanese people make “Gambaru” as their philosophy, Gambaru means “Let's struggle and never give up”.

B. In contrast to the paradigm that has been adopted by the government is only looking at the extent of the disaster risk reduction activities of the technical side of disaster, speakers with colleagues from the Faculty of Engineering has been trying to implement a new model that DRR-based approach to holistic / comprehensive. Such programs not only touch the technical aspects but also **social, economic and cultural aspects**. This approach was developed on the basis of the fact that people who have both economic security it also has good resistance to disaster anyway. Japan had already been using this method because they have a culture and a good economy so that disaster management is part of their culture that can not be separated from their lives, and they've instilled this culture since their small school kindergarten.

C. Full use of modern information technology, to build a well-developed information technology support system.

Advanced information technology and information system in disaster emergency management is very important. Japan a few minutes, the earthquake situation and disaster statistics can achieve quick report of Indonesia's earthquake situation it takes 15 to 30 minutes the disaster the quick report should take 5 to 10 hours, access to information and the transmission speed is seriously lagging behind. Therefore, this should be the full development of modern information technology, to establish nationwide efficient and effective the disaster information technology systems. Japan's experience, the use of map information as well as the global satellite positioning (GPS) technology the space integrated management (GIS) and computer-aided design (CAD), remote sensing (RS), multimedia, virtual reality technology, the Internet combined, building operations strong intelligence collection system (such as geographic information systems, information resources such as databases) and so on. IT support system will greatly improve the disaster information collection and transmission of accurate, efficient, timely and comprehensive goals to achieve.

D. Quickly and accurately assess the information system to ensure true and reliable disaster information.

Learn from the experience of the Japanese disaster management, in order to ensure that the decision-making and information communication correctly, you must set the scientific analysis and evaluation system: First, it is necessary to improve the overall quality of the information analysts to grasp the scientific method of analysis. Second, we need to introduce professional analysis tools, to ensure that the conclusion is as accurate as possible. analysis Third, we must establish a system of disaster assessment system, such as a complete disaster assessment background database, rapid and effective disaster assessment model, authoritative experts of disaster assessment system. Thus objectively reflect the actual scope of the disaster, the extent, size and loss and to ensure the timeliness, in order to facilitate the timely development of relief decisions. Fourth, we must design natural disaster risk maps in each city, the entire society and the people in the disaster prevention ability and consciousness.

E. Strengthen disaster information publicity, education, drills, training, socialization mechanisms construct disaster information.

How informed the extent of the disaster-related information, as well as the actual ability to respond to disasters, public awareness of disaster crisis directly affects the level of the government to respond to disasters. Public disaster awareness in our country still is very weak, and obviously cannot keep the frequency and extent of the outbreak by the

disaster. We want to learn from the advanced experience of Japan, First, we must instill risk awareness to the public through the mass media and various forms of propaganda, to develop their disaster prevention and awareness, to enrich their knowledge and skills to cope with; public two recurring disaster prevention rescue skills education and training, to absorb the public and social organizations involved in disaster relief exercises, enhanced with governmental disaster awareness, improve their endurance, and disaster response capacity, educate the community and the normalization of the disaster prevention and relief.

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