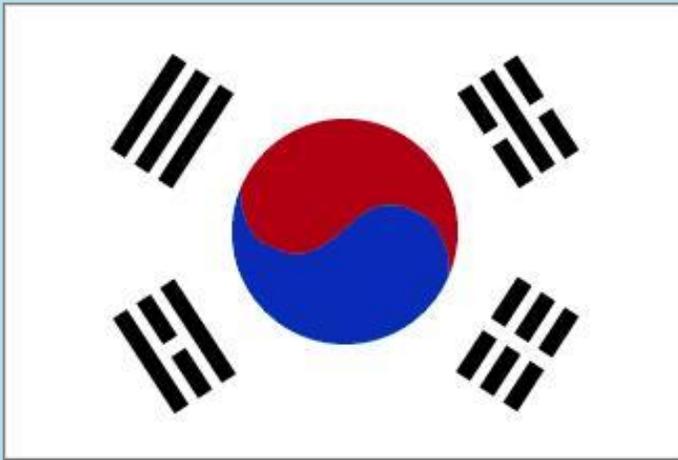


SOUTH KOREA



- [NATIONAL PROFILE](#)
- [DISASTER RISK PROFILE](#)
- [INSTITUTIONAL SETUP](#)
- [INITIATIVES](#)

1. NATIONAL PROFILE

1.1 General¹

Korea, an independent kingdom for much of its long history, was occupied by Japan in 1905 following the Russo-Japanese War. The Korean peninsula regained its independence following Japan's surrender to the United States in 1945.

After World War II in 1950, Korea was divided into two countries—North Korea and South Korea.

A democratic-based government (Republic of Korea, ROK) was set up in the southern half of the Korean Peninsula while a communist-style government was installed in the north (Democratic People's Republic of Korea, DPRK). During the Korean War (1950-53), US troops and UN forces fought alongside ROK soldiers to defend South Korea from a DPRK invasion supported by China and the Soviet Union. A 1953 armistice split the peninsula along a demilitarized zone at about the 38th parallel.

The Korean peninsula lies longitudinally between 124°11' E - 131°52' E and latitudinally between 33°06'N - 43°N in the northern temperate zone of the Eastern Hemisphere. The overall area of the Korean peninsula is 221,392 square kilometers, or about 84,600 square miles. The communist-controlled zone, north of the truce line, comprises 122,370 square kilometers, while the Republic of Korea to the south is slightly smaller, with 99,022 square kilometers. The Korean peninsula is approximately 1,000 kilometers in north-south length, and 216 kilometers wide at its narrowest east-west point. Korea can be compared in size with the British Isles or West Germany, and the southern part with Jordan or Holland.

South Korea is a capitalist country, has a population of 48 million, and the size of its territory is 99,900 km² (National Emergency Management Agency of Korea 2009). This country has been recently classified into a newly developed nation. The Republic of Korea is surrounded by the Yellow Sea in the west and the Sea of Japan in the east. Approximately 70 percent of 99,274 square kilometers of land is mountainous. Western and southern parts are covered with plains, whereas mountainous in the north and east. The coast is surrounded by about 3,400 islands. Cool temperate climate zone: hot and rainy in summer, cold and dry in winter. The capital is Seoul. 48.46 million population is mostly occupied by the Korean. The

climate of Korea belongs to the humid-temperate zone and is both continental and oceanic in character. The climate is relatively mild with a clear distinction between the four seasons.

1.2 Physiography²

Korea is a mountainous peninsula in the Far East extending southeast from Manchuria. It is separated from Manchuria by the natural boundaries of the Yalu river, Mt. Baegdu and the Duman River. The Duman river separates Korea from Siberia at its mouth. The Korea peninsula together with 3,579 islands mostly clustered off the southwestern coast is flanked by two oceans, the East Sea on the east and the West Sea on the west.

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1.3 Climate²

The climate of Korea belongs to the humid-temperate zone and is both continental and oceanic in character. The climate is relatively mild with a clear distinction between the four seasons.

July and August afford the hottest days, while the coldest winter days fall in December and January. All meteorological stations report the mean summer temperature being about 20 to 25°C with a maximum in August, and mean winter temperature 5.0 to -5.0°C in south and -5.0°C to -20°C in north with a minimum in January.

The annual precipitation ranges from 1,000 to 1,380 mm except for most of northern Korea and a small area around Daegu. About 50 percent of the annual rainfall occurs in the months of July, August and September as a result of the influx of warm moist air from the Pacific Ocean where pressure conditions create the summer monsoon.

Because of a warm temperature climate with moderately high rain fall in summer, most of the Korean soils of the coastal plain, alluvium plain, terraces, hilly land and low mountains are relatively deep and well oxidized.

1.4 Socio-Economic conditions ^{3,4,5}

Socio-economic Indicators		
GDP: Gross domestic product (million current US\$)	2011	1116247
GDP per capita (current US\$)	2011	23067.0
GNI: Gross national income per capita (current US\$)	2011	23130.0
Population (millions)	2014	49.26
Urban (% of population)	2014	83.76
Sex ratio (males per 100 females)	2012	99.4
Life expectancy at birth (females/males, years)	2010-2015	84.0/77.3
Adult literacy rate (% ages 15 and older)	2014	97.9
Expenditure on education (% of GDP)	2014	5.05

2. DISASTER RISK PROFILE

2.1 Vulnerability of the Country ⁶

Owing to the political tension between the two Koreas, there has always been a threat of war. In addition, one can experience four distinctive seasons—spring, summer, autumn, and winter—in Korea, resulting in hazardous weather changes throughout the year. Among the numerous hazards, three kinds of hazards can be summarized as follows.

The first hazard is floods, resulting from typhoons that Korea faces each summer. Typhoons usually hit the Korean peninsula between June 1 and December 31 every year with torrential rainfall. When a typhoon hits, floods are inevitable. Historically, Korea has been an agricultural society. As rice is the main food of the Koreans, this country cultivates rice among many other agricultural products. In many ways, the appropriate amount of rain during the flood season has been very useful for the Koreans to cultivate rice. However, the heavy floods brought about by the rainfall have led to economic damages and the loss of lives.

The second hazard is fires, which causes death, injuries, and economic damages. Obviously, there were many incidences of big fires in ancient Korea including mountain fires, building fires, etc. However, as this society became more modernized and complicated, the occurrence of fires and related human loss has continuously increased. For example, with regard to fire accidents, there was a 5.5% increase between 1996 and 2006. Additionally, there was a 1.4% increase in terms of human loss during the same period (National Emergency Management Agency of Korea 2007). With regard to the different kinds of fire accidents, it has been observed that house or apartment fire caused the maximum human losses and economic damages in Korea between 1996 and 2006. In particular, electric burnout was the major cause of house or apartment fire during that period. Also, many incidences of fire occurred in mountainous areas. Interestingly, the maximum occurrence of mountain fires was in April during each year (Ha & Ahn 2009). Though there were not many serious wildfires or bushfires caused by nature, most of them were caused by either human mistakes or arsonists.

The other hazards that have a major impact on the Korean society include many critical hazards that are not only natural but also man-made. Specifically, drought, heavy snow, earthquake, the yellow-dust phenomenon, etc., are considered as natural hazards. In particular, the yellow-dust phenomenon is a seasonal and meteorological one that happens during spring around Korea. The airborne particulates are sporadically carried by prevailing winds. On the other hand, acts of terrorism, oil spills, domestic violence, economic crisis, etc., are considered man-made hazards.

Natural disasters result in damages adding up to an annual amount of USD 700 million, which was determined from a statistical study by Ministry of Government

Administration and Home Affairs (MOGAHA). Also, these natural disasters result in a yearly average of 160,600 acres (64,992 hectares) of flooded land and 165 deaths.

The most frequent and destructive natural hazards are heavy rainfalls and typhoons. Two thirds of these natural disasters occur between June and September each year.

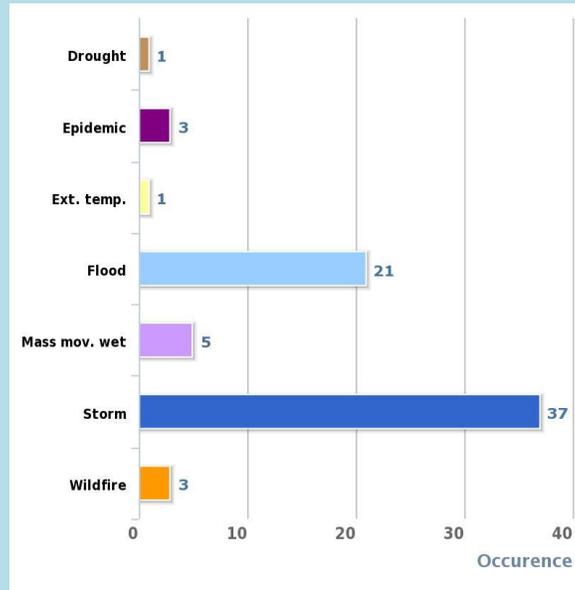
Korea is also susceptible to earthquakes to a lesser extent. Although Korea is located in the interior of the Eurasian plate and not along a tectonic boundary, Korean human history has recorded earthquakes and tsunami. Tsunamis are of concern due to Korea's close vicinity to Japan, where earthquakes occur frequently, and because Korea is located on a peninsula, which is surrounded on three sides by water. The eastern coast of Korea has been hit by the tsunami in 1983 and 1993.

2.2 Natural Disasters from 1980 – 2010⁷

I. Overview

No of events:	71
No of people killed:	3,252
Average killed per year:	105
No of people affected:	1,733,531
Average affected per year:	55,920
Economic Damage (US\$ X 1,000):	14,869,523
Economic Damage per year (US\$ X 1,000):	479,662

II. Natural Disaster Occurrence Reported



III. Top 10 Natural Disasters Reported

Disaster	Year	Affected Population
Flood	1984	351,171
Flood	2001	295,000
Flood	1990	189,260
Flood	1987	154,000
Flood	1998	121,000
Storm	2002	88,625
Storm	2003	80,000
Storm	1989	75,194
Flood	1996	60,365
Storm	1987	56,000

IV. People killed during 1980-2010

Disaster	Year	People killed
Storm	1987	483
Flood	1998	403
Storm	2002	194
Flood	1984	166
Storm	1980	150
Storm	1987	136

Storm	2003	130
Flood	1990	127
Storm	1981	113
Storm	1989	109

3. INSTITUTIONAL SETUP ^{6,8}

3.1 Disaster Policy

Disaster policy is what the governments have continued to do for the purpose of emergency management in Korea. By passing appropriate laws and regulations, the government in Korea has made efforts to formulate and implement related policy.

Since the establishment of the Korean government at the beginning of the 1950s, there have been more than 70 laws and regulations about emergency management. Before March 2004, the government policy was to manage each disaster or emergency by enacting individual laws and regulations. However, the government did not comprehensively manage all kinds of disaster by relying on a single law or regulation. Instead, according to table 1, there were three significant acts on emergency management before the year of 2004. These three acts were classified based on the kinds of disaster that the government focused on managing.

Table 1, List of Acts

Before year 2004		After year 2004	
Year 1975	Civil Defense Basic Act	Year 2004	Emergency and Safety Management Basic Act
Year 1995	Natural Disaster Counter- Measure Act		
Year 1995	Emergency Management Act		

1. The “Civil Defense Basic Act” was passed in July 1975 to protect human lives and reduce the economic damage resulting from enemy attacks, terrorism, or civil disturbance in local areas (Kim & Lee 1998). This Act was enforced to deal with war and terrorism more severely than other acts. Civil Defence has perhaps been given more importance in the field of emergency management than many other nations. Through this Act, the government organized related institutions, personnel, and other ways of operation.
2. The “Natural Disaster Counter-measure Act” was enacted in December 1995 to manage all kinds of natural disasters in Korea. The Natural Disaster Counter-measure Act was based on two previous acts on natural disaster- the “Flood Disaster and Relief Act” and “Flood with Typhoon Counter-measure Act.” The Flood Disaster and Relief Act, 1961 is the first act pertaining to natural disaster management. In 1967, the Flood with Typhoon Counter-measure Act was passed which included the management of earthquakes, droughts, and flood with typhoon (Ha & Ahn 2008-2).
3. Third, the “Emergency Management Act” was passed in 1995 for the purpose of comprehensive management of man-made disasters. This Act was passed after combining aspects of the “Architecture Act” and the “Firefighting Act. This Act was formulated to provide timely systematic relief assistance to emergency victims and affected communities. However, many criticized that this Act failed to manage man-made emergency in affected communities, and instead played a role in managing certain institutions about man-made emergency at the central government level.
4. The governments began to comprehensively manage all kinds of disaster by establishing the “Emergency and Safety Management Basic Act” in March 2004. Based on the previous experiences from the above acts, the government tried to manage social emergencies (including those relating to critical infrastructure and key resources) as well as natural disaster and man-made emergency through this Act. In short, though not at a comprehensive level, the government has initiated efforts to set up a modern emergency management system. This Act has made efforts to emphasize the role of government for emergency management, without equally supporting the activity of other players such as voluntary organization, business corporations, and local community.

The Act on Disaster Risk Management and Reduction enacted in 2008 stipulates the basics of the disaster management policies of Korea. There are other DM related laws including the Disaster and Safety Management Basic Act enacted in 2004, the Natural Disaster Countermeasures Act enacted in 1995, the Water and Wind related Disaster Insurance Act, the Act on Disaster Risk Management and Reduction of Reservoir and Dam enacted in 2008, the Special Law on Reduction of Disaster Risk and Emigration Measure in 2007.

3.2 Organization of Emergency Management

In the field of Korean emergency management, public organization has historically dominated the relationship with the private organization. A popular thought has been that emergency management is a sort of public good. Also, the unitary government system has been developed that consists of three-level governments, such as the central government, the province and the metropolitan government, and the local government. When compared with the federal government system, lower-level governments in Korea have had less autonomy.

The central government established the **National Emergency Management Agency** (NEMA) of Korea in June 2004 to start comprehensive emergency management. Before the establishment of NEMA, several institutions used to manage their own special emergency area. Now, the NEMA, under the Ministry of Public Administration and Security (MOPAS), has substantially focused on managing both firefighting and civil engineering. The MOPAS recently tried to setup its own policy area by giving more emphasis to the function of policy decision than the NEMA.

Lower-level governments, such as the provincial government, the metropolitan government, and the local government, have setup their own “Section of Emergency Management” in each institution, to primarily handle flood with typhoon. Also, fire stations are located in each local community to handle fire accidents. Furthermore, police stations in each community play a major role in taking care of terrorism in Korea than other emergencies (Yi, Cheong, Jin, & Miller 2009).

An increasing number of business corporations are setting up their own business continuity plans (BCP) since the establishment of NEMA in 2004. In particular, the export-oriented corporations have expanded their BCP activity because they may find it difficult to work on international affairs without implementing their own BCP, according to the agreement with World Trade Organization. The governments have also tried to help them to establish BCP by passing a related act, which is the “Act on Government’s Helping Business Corporations to Voluntarily Set up Their BCP.” However, small- and medium-sized corporations have worked for BCP, mainly by setting up their computer backup systems.

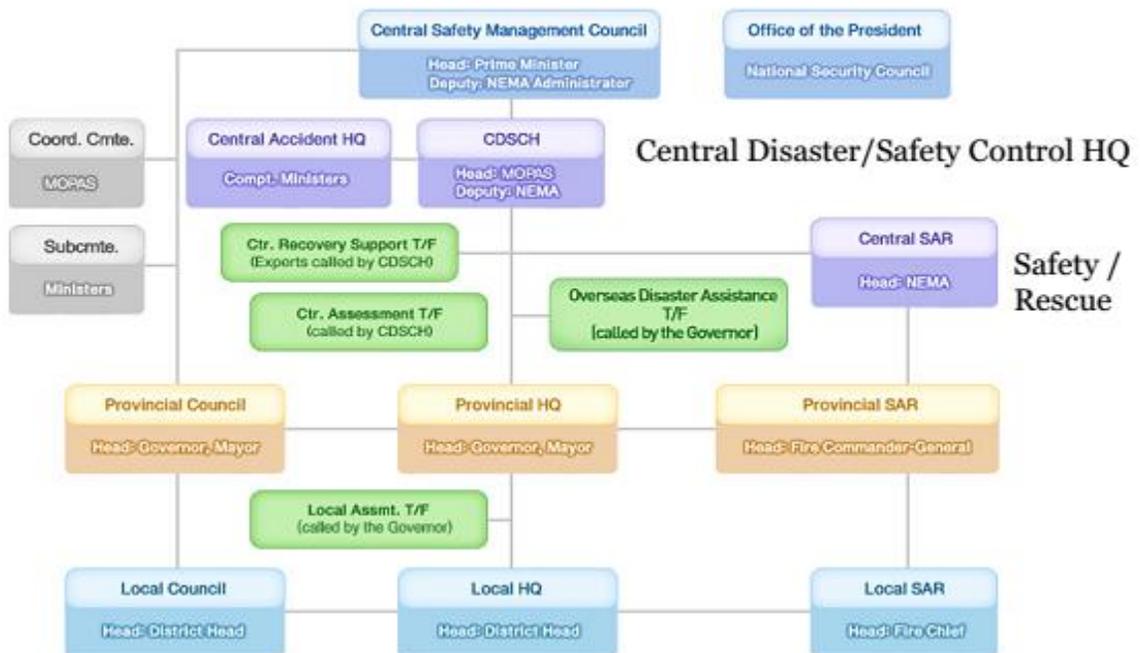
Voluntarism without being paid has not historically been a popular activity in Korea, although its activity has recently increased. However, the virtue of cooperation has been very popular by giving and taking diverse forms of assistance during emergency. There are not many professional voluntary organizations in Korea. Instead, community-based organizations (CBOs) have played diverse roles in emergency management, which include the Young Men Group, the Married Women Group, etc. To boost voluntary activity, the NEMA, as a government institution, has participated in voluntary organizations as their members, which include the Korean Disaster Safety Network (KDSN) and the Citizen Corps Active in Disaster (CCAD).

Residents and their community have to deal with emergencies more directly than anyone else. Since the establishment of NEMA, many residents have increased their awareness of disasters and emergency management, although there is still room for improvement. When an emergency receives national attention via mass media or Internet, awareness among residents and their community dramatically increases. However, a majority of the residents have not attempted to setup their own written emergency operation plan (EOP), though some have done it verbally (Ha & Ahn 2009).

Division of Labor between Disaster Management Organizations



Organizational Map of National Disaster Management System



Source: article of M Jae Moon, Yonsei University Korea

National Disaster Management Structure And Relevant Legislation

In the late 1990's, the Korean government began disaster management improvement dealing with response to natural and man-made disasters, and improving related programs such as its disaster management information systems and flood insurance programs. This is head by the National Disaster Prevention and Countermeasures Headquarters (NDPCH) and is under the Ministry of Government Administration and Home Affairs (MOGAHA), which manages and operates the Central Civil Defense Council and the Disaster Countermeasures Committee. Twenty-one central government agencies and 16 regional governments are also involved with disaster management and prevention sectors ³⁹.

The central and regional governments have emplaced long-term land use planning techniques to promote flood mitigation practices. The goal is to establish a nationwide disaster preparedness plan and disaster recovery procedures for its citizens and the infrastructure. The government of South Korea is developing a national flood insurance program due to the increasing amount of property damage caused by floods.

Korea's disaster management and prevention plans are implemented by each ministry and regional government, and the government-invested organizations, such as the Korea Water Resources Corporation, Korea Highway Corporation, Korea Environmental Management Corporation, and Korea Electric Power Corporation. The Korea Water Resources Corporation (KOWACO), which is under the jurisdiction of the Ministry of Construction and Transportation, focuses on effective utilization of the existing water resource facilities, the construction of new dams, expansion of water supply facilities, and the improvement of embankment works to prevent flood damage based on the long-term water resources plan (2001-2020) and the long-term dam construction plan (2001-2011). The three main goals of the Korean government's five-year disaster management and prevention plan are to:

- “Establish a comprehensive response system against natural disasters, focusing on preventive countermeasures;”
- “Establish a disaster prevention information system and science-based disaster prevention strategies and policies;”

- “Promote international cooperation and prepare for the unification of Korea.”

I. National Emergency Management Agency (NEMA)

NEMA was established under the umbrella of the Ministry of Public Administration and Security (MOPAS) is comprehensively in charge of disaster management policies in Korea. Once a disaster takes place, a special task force called the Central Disaster and Safety Countermeasures Headquarters (CDSCH) is formed. The CDSCH is in charge of natural disaster prevention, situation management and relief planning, in addition to take necessary measures in times of disaster.

The National Emergency Management Agency (NEMA), is composed of four Bureaus (Planning and Management Bureau, Mitigation and Planning Bureau, Response and Management Bureau, and Recovery and Support Bureau).

While NEMA takes care of the “practical affairs for a regular period,” when a disaster happens, The Central Disaster and Safety Countermeasures Headquarters (CDSCH) has the task “of prevention and status control of natural disasters, as well as recovery planning, and executing the necessary measures related to such disasters”³⁸.

II. The National Disaster Management Institute (NDMI)

The National Disaster Management Institute (NDMI) was established in 2006, which provides disaster management trainings and drills for the citizens and civil servants.

III. National Institute for Disaster Prevention (NIDP)

The NIDP was formed in 1997 in order to develop the disaster management technology and the national policies.

4. INITIATIVES⁶

The Republic of Korea has been taking steps to enact disaster preparedness in the sense of relief and building standards after the Kobe 1995 earthquake. The Korean government has long-term disaster preparedness plans and the following projects have the most potential in the Korean disaster prevention-mitigation sector:

- **National Safety Management Information System:** “This involves an emergency communication network linking the central government, 24 government-affiliated organizations, and 16 regional governments. Since 1996, MOGAHA has implemented of the National Safety Management Information System, which is part of it’s’ disaster prevention and mitigation projects. The purpose of this project is to integrate each ministry's safety management operations with the 16 regional governments to establish a scientific and systematic national disaster management system. This will be communicated via wireless and satellite network, utilize GPS (Global Positioning System), GIS (Geospatial Information System), GMS (Geostationary Meteorological Satellite), GEOS (Geostationary Operational Environmental Satellite), and other advanced systems. The result will be forecasting and analyzing applications, wireless vehicle management, satellite and radio telecommunications, and expansion of information system links between the government's disaster-related organizations and communities.”
- **Flood Insurance Program:** “The national flood insurance program produces flood insurance map production and flood plain management. The new national flood insurance program will enable the government to provide flood insurance to regional entities across the nation. The Korean government will develop a community rating system to encourage regional entities to adopt floatplane management standards set by a national flood insurance program.”
- **Countermeasures to Mitigate Natural Disasters:** “Methodology is applied to estimate disaster damage, techniques for slope failure mitigation, a rainfall runoff reduction system, and disaster mitigation concepts for land use and development planning.”

The government of South Korea provides for displaced citizens after a disaster as well as the recovery cost for damaged homes and land used for agriculture. They have identified 537 sites in South Korea that are at risk of typhoons and floods, and have labeled these areas as “Disaster Prone Areas.” These structures were invested in between 1998 and 2004 for improvements.

The MOGAHA (Ministry of Government Administration and Home Affairs), in May 1995, began the National Disaster Management System (NDMS) project as under the Cyber Korea 21st Century and the National Administration Reform 100 Projects. “The project includes the interconnection of safety management operations distributed among management agencies, 24 affiliated organizations, and local autonomies, to link the safety management systems. The objectives of the project are to protect the lives and property of citizens and to improve the living quality of the people by preventing disasters threatening the safety of the people and nation.

In South Korea, “planning activities are performed on three scales: the national, the local, and the individual building,” and acts as a “centralized and top-down plan.” Plans are restricted to the national level by Land Use Management Law, the City Planning Law for urban areas, and the Building Law for individual buildings. The City Planning Law requires limitations regarding zoning, building plans, and implementation plans. Also, “a District Unit Plan is used for comprehensive and systematic improvements to buildings and infrastructure in specially designated districts.”

In regards to natural disaster preparedness and reducing loss of life, property damage, and monetary loss, the Korean government has implemented a construction monitoring system. Several government officials monitor large scale construction sites and ensure that Disaster Preparedness Plans are in place and maintained. On an annual basis, before the rainy season, plans are implemented for repairing disaster prevention facilities, which includes retaining walls, embankments, and reservoirs. This also includes inspection and repairs for the facilities to be completed.

On the national government level, earthquake management is addressed by the Disaster Prevention and Preparedness Bureau (DPPB) in the Ministry of Home Affairs. In May 1999, the DPPB merged with the Civil Defense and Disaster Management Bureau to become the Civil Defense and Disaster Prevention Bureau (CDDMB).

After the 1995 Kobe earthquake, an earthquake governance system was established to initiate public policies focused on prompt, efficient, and effective management of unexpected earthquakes. This national level policy is also enacted on the city level. These earthquake management policy initiatives can be grouped according to the four management phases:

- i. “Pre-disaster mitigation/ prevention: Policy Initiatives taken to alleviate the impact of or prevent a disastrous event. Examples include land use management, building codes, disaster insurance, risk mapping, safety codes, and tax incentives and disincentives.”
- ii. “Pre-disaster preparedness: Measures adopted in advance of a disaster to aid in its management. Examples are emergency operations plan, warning system, emergency operating center, emergency communication, emergency public information, mutual aid agreement, resources management plan, training and exercise.”
- iii. “Disaster response: Activities that occur during and immediately after a disaster strikes. Examples are emergency system activation, search and rescue operations, and the provision of food, shelter, and clothing.”
- iv. “Post-disaster recovery: The long-term reconstruction of a community affected by disasters. This stage can last up to 10 years. Examples are debris clearance and contamination control.

3.1 Disaster Risk Management Vision⁶

The Rapid Response plan, which was adopted by Seoul in 2001, is for fast and effective post-earthquake assistance. The response plan has been improved by many trial and error exercises in advanced earthquake management countries such as the U.S., Japan, and Taiwan. The rapid response system consists of an

accelerometer network, a real time observation network, an earthquake damage scenario database, and a response scenario database.

3.2 Global Education and Training Institute for Disaster Risk Reduction ⁹

The UNISDR secretariat and Government of the Republic of Korea established global education and training institute for disaster risk reduction (the ONEA/GETI) in 2011. The Office's purpose is to develop a cadre of professionals in disaster risk reduction (DRR) and climate change adaptation (CCA) to promote the building of more resilient societies. Its core areas, in support of the implementation of the Hyogo Framework for Action (HFA), are providing technical support to:

- i. Conduct capacity development and training initiatives
- ii. Carry out advocacy initiatives
- iii. Enhance knowledge management and the sharing of experience and best practice
- iv. Promote partnerships

3.3 Policy Implications in Relation to the Hyogo Framework for Action (HFA)¹⁰

- i. Making disaster risk reduction a priority

It has participate in and hosted international Safe Communities conferences, where disaster preparedness and response in one of the topics.

- ii. Improving risk information and early warning

Hosting 14 university campuses to conduct advanced hazard and vulnerability mapping, as well as design early warning systems. Also involved in community participation for effective dissemination and early warning system.

- iii. Building a culture of safety and resilience

Play an active role in the network and to contribute to its own aspirations. It has contributed in promoting disaster education and public awareness and has produced and shared related information products.

iv. Reducing the risks in key sectors

Sectoral development plans (tourism, industry, health, water resources, environment, etc.) incorporated DRR element

v. Strengthening preparedness for response

The government encourages community participation especially in DRR related activities. The involvement of the residents in the design and implementation of DRR program and projects will ensure that they are properly customized to the local vulnerability and to the needs of the affected people.

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