

GLOBAL BLUEPRINTS FOR CHANGE

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The Global Blueprints for Change contain guidance for working together to improve the capability to identify indicators of physical, social, enterprise, and environmental vulnerabilities throughout the world and to select and implement realistic solutions to reduce them towards acceptable levels.

Theme A: LIVING WITH NATURAL AND TECHNOLOGICAL HAZARDS
Topic A.6: Improving Emergency Management

“Enhancing Local and National Competencies for Disaster Management in Taiwan”

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ENHANCING LOCAL AND NATIONAL COMPETENCIES FOR

DISASTER MANAGEMENT IN TAIWAN

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SCOPE:

Owing to natural factors (such as global weather changes, plate movements) and man-made factors (such as population increase and concentration, expanding urban limits caused by economic development, massive land development, increasing urban function) in last decades, like most regions on the world, Taiwan's natural and man-made disasters happen more frequently. The causes and contents of disasters become more complex, and losses from disasters also increase. For example, ever since Typhoon Herb hit Taiwan in 1996, causing large scale debris flow in Shin-Yi Shiang, many remote mountain areas have reported debris flows and landslides. After the magnitude 6.2 Ray-Li earthquake struck in 1997, Chi-Chi earthquake (M 7.6) hit Taiwan on September 21, 1999, resulted in more than 2470 life losses, and more than 10billions U.S.D. economic losses. In addition, Typhoon Shiang-Sen swept Taiwan with strong wind and hard rain on October 31, 2000, causing severe flooding in Taipei and Keelung, and making a Boeing 747 explode, claiming 81 lives and causing a natural and man-made multiple disaster while departing from the airport. With higher frequency and larger scale disasters, preventing the happening of disasters and establishing an emergency response system in order to achieve an efficient hazard management have become a very important issue nowadays.

CURRENT STATUS :

Hazard mitigation works in Taiwan began a long time ago. As early as the 1950s, "Natural Disaster Relief and Management Code" was elaborated to deal with the situations after occurrence of typhoons and floods. According to this Code, local government will form a temporary task force after a typhoon warning is issued for emergency management. In the meantime, to enhance the level and capability of hazard mitigation, National Science Council (NSC) had started a large-scale disaster prevention science and technology project (known as the "National Hazard Mitigation Inter-Disciplinary Project") since 1982 to promote related research by scholars in universities. The "task force" is a temporary and mission-oriented team. It is dismissed right after a typhoon, which is no longer a threat. Therefore, long-term hazard mitigation and rescue tasks are hard to promote, and the capabilities of hazard management are also affected. Recently, in order to promote hazard mitigation practices more systematically, the Executive Yuan (i.e. the Cabinet) of the central government promulgated "Hazards Mitigation Program" in 1994 as the basis for national and local disaster prevention tasks in Taiwan. According to this program, Taiwan has established 4 levels of hazard mitigation organizations at the central and local governments (including Province/Municipality, County/City, and Township/Shiang levels).

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Based on its essence, governments at all levels have their own Hazard Mitigation Councils (HMC), and at the Central, Province/City, and County/City levels, Hazard Mitigation Committee and Technical Advisory Committee have to be established under the supervision of HMC. The Hazard Mitigation Committee is the administrative organization; while the Technical Advisory Committee provides consulting services for different levels of government hazards mitigation councils. Also, as the basis and references to hazard mitigation tasks of different levels, this program stipulates that the Central Hazards Mitigation Council have to elaborate “Primary Hazards Mitigation Plan”, ministries under the Executive Yuan have to put in place “Specific Hazards Mitigation Plans”, and local governments have to put in place “Local Hazards Mitigation Plans”.

Nevertheless, this program, as well as hazard mitigation systems and hazard mitigation plans established by its essence, had faced the challenges of several large -scale disasters in recent years. In particular, the Chi-Chi earthquake on September 21, 1999, which resulted in severe casualties and economic losses, has great impact on and exposes the weakness of this hazard mitigation system. Therefore, to improve and enhance this system, as well as to raise the capabilities of hazard mitigation and emergency responses, have become crucial issues.

Based on devastating experiences of Chi-Chi earthquake and other severe disasters, there are many problems drastically needed to be improved after reviewing current disaster prevention and emergency management practices. The following is a brief discussion regarding improvement and enhancement to these problems made in recent years.

MAJOR ISSUES :

In recent years, major problems related to hazard mitigation and emergency response that were aggressively improved and enhanced can be divided into three broad categories: laws and regulations, researches and practices of science and technology, enhancement of civilian organizations and communities.

1. Laws and regulations

1) Hazard Mitigation Act

In the second year (2001) after occurrence of the Chi-Chi earthquake, the legislature has passed “Hazard Mitigation Act” on June, and promulgated by the President on July.19. Since then, Taiwan finally has a formal legal basis for its disaster prevention and emergency response tasks. The chapters of this law includes: general rules, organization of disaster prevention and emergency response, disaster prevention and emergency response planning, disaster prevention and mitigation, emergency management, recovery and restoration, penalties and appendix. In eight chapters and fifty-two articles of this law, they help establishing Taiwan’s hazard mitigation systems; regulating legal hazard mitigation and emergency management planning and tasks for mitigation and preparedness; stipulating the organizations, equipment, exercises and training needed for emergency response, as well as the establishment of information collection and dissemination system; enhancing connections with communities and civilian organizations; establishing mutual support and coordination mechanisms among local governments; legally stating the regulations for summons of civilian manpower, equipment, and their compensations; etc..

2) Hazard mitigation system and organization

According to the “Hazard Mitigation Act”, Taiwan’s hazard mitigation systems are composed of agencies of the Central, County/City, and Township/Shiang governments. (see fig. 1) These governments at three levels are required to established Hazard Mitigation Councils, respectively, which are responsible for decision-making and promoting hazard mitigation and disaster response tasks. Under these Councils, dedicated Hazard Mitigation Committees and Technical Advisory Committees are established for the execution of hazard mitigation tasks and providing consultations. When a large scale disaster strikes, the Emergency Operation Center (EOC) will be set up immediately in order to carry out emergency response and SAR tasks, and a Recovery Commission will be constructed

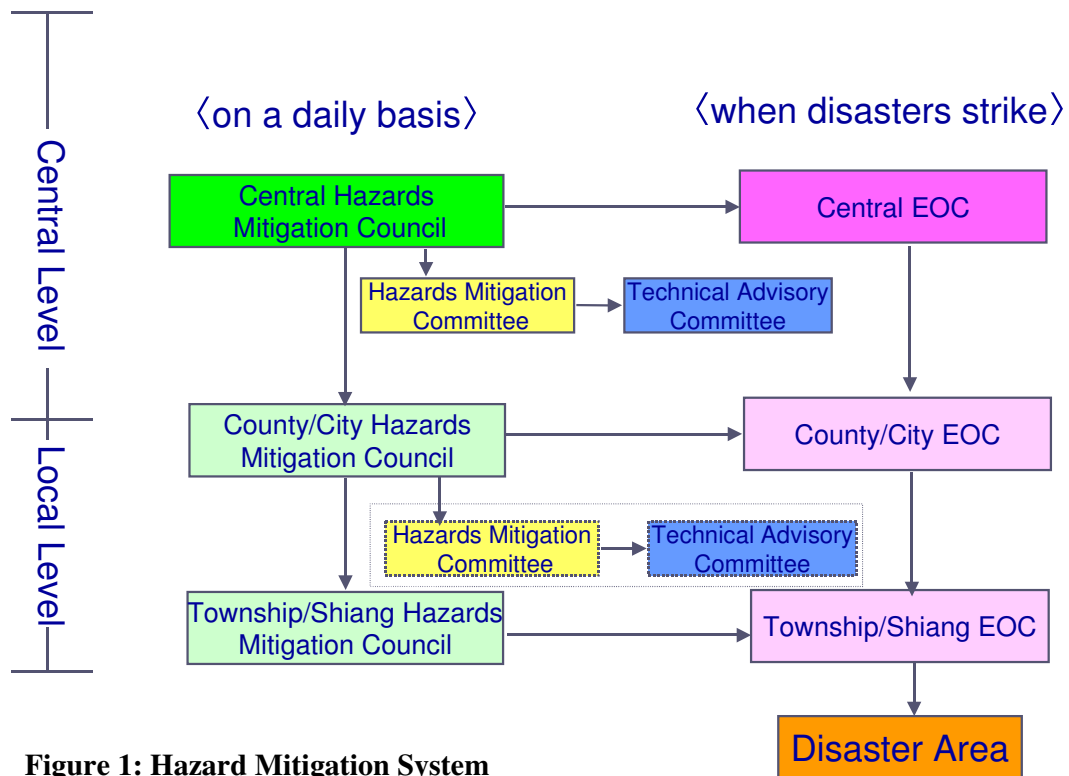


Figure 1: Hazard Mitigation System

afterward for the recovery and restoration affairs. In the meantime, to execute emergency response and SAR tasks more efficiently, ministries under the Executive Yuan and utility companies must assemble emergency response teams, and the Ministry of the Interior and County/City governments are responsible for assembling search and rescue teams. In addition to the general administrative system, according to the Act, military, reserved military, civil defense groups, and civilian and community organizations are also included in this hazard mitigation and response system.

Currently, the Hazard Mitigation Councils of all level governments, emergency operation centers established as soon as a disaster strikes, Central government’s dedicated Hazard Mitigation Committees under the Executive Yuan and the Technical Advisory Committee, as well as emergency response teams of ministries under the Executive Yuan are all set up and operational. Some County/City governments also have established

search and rescue teams to respond to the needs of emergency responses. Other related organizations are reviewing their situations and preparing to establish their own hazards mitigation organizations. In summary, a formal organizational system is in place to deal with major disasters.

3) Hazards mitigation plans

According to the “Hazard Mitigation Act”, the Central Hazard Mitigation Council have to put in place the “Primary Hazards Mitigation Plan” as the basis and references to Taiwan’s hazard mitigation tasks, ministries under the Executive Yuan and public utility companies have to put in place “Specific Hazards Mitigation Plans” to state the tasks they have to carry out in near future. Besides, to promote local hazard mitigation tasks more systematically, local governments have to put in place “Local Hazards Mitigation Plans”. All the plans have to be reviewed and revised every two years in order to respond to local changes of physical environments and socio-economic conditions.

Currently, the “Primary Hazards Mitigation Plan” has been renewed, and ministries under the Executive Yuan, public utility companies, local governments also began to revise their plans respectively.

2. Research and practice of science and technology

1) The establishment of Hazard Mitigation Science and Technology Center

Although many research organizations related to disaster prevention and response research organizations have been set up in Taiwan’s universities, in order to raise and implement hazard mitigation related technologies, a Hazard Mitigation Science and Technology Center at national level has long been advised through discussions at several successive national science and technology conferences in the past. To response these advices and meet the needs of hazard mitigation practices, the newly promulgated “Hazard Mitigation Act” clearly states that the national level Hazard Mitigation Committees of the Executive Yuan is authorized to establish a Hazard Mitigation Science and Technology Center. The National Science Council is currently planning and preparing its establishment.

2) National Science and Technology Program for Hazards Mitigation (NAPHM)

To enhance the transferring of research results on hazard mitigation technologies, as well as

to implement these results in hazard mitigation and response tasks, the Research Committee for Sustainable Development of the National Science Council formed a planning team to deliberate a large scale inter-ministries and inter-disciplinary research project, which is approved in 1998 and started its first phase, 3-year program from 1999 to 2001. The major research framework (see fig. 2) divides the research issues into three groups: Typhoon hazards mitigation (including Meteorology, Flood mitigation, Debris flows mitigation), Earthquake hazards mitigation (including Seismology, Earthquake engineering), and Hazard Mitigation System (including Management system, Information system), to carry on a vast number of research projects.

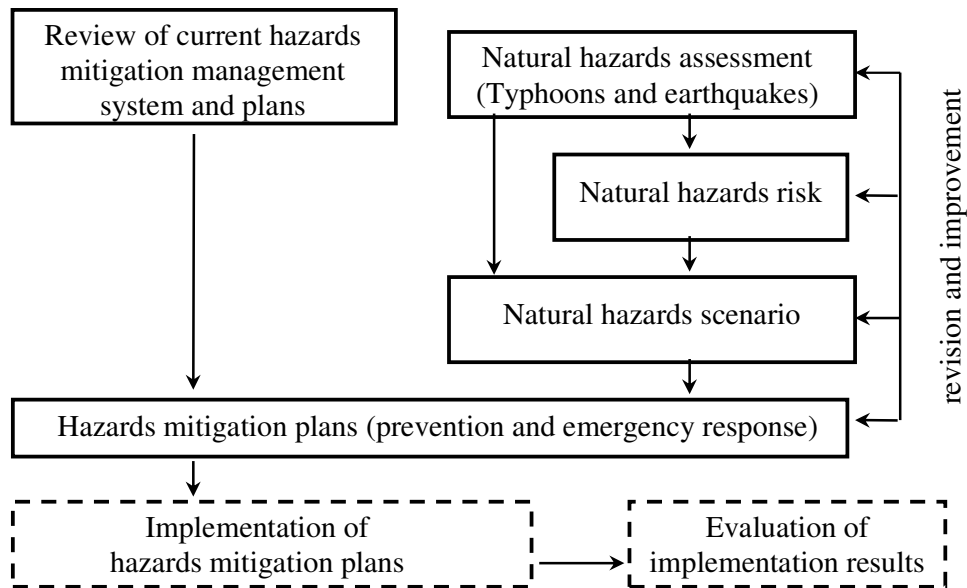


Figure 2: Framework of National S&T Program for Hazards

In the first and second years, 92 and 107 research projects were funded respectively. A total fund of 215600000 and 345900000 NTD respectively was spent on these projects. 2001 is the third year of the NAPHM's first phase. Planning for the second phase of the five-year project is finished and will be executed starting next year (2002).

3) Implementation of research results on science and technology

The National Science and Technology Program for Hazards Mitigation is a mission-oriented research program. Its primary mission is to transfer research results into hazard mitigation and rescue related organizations, in order to enhance both the levels and capabilities of hazard mitigation tasks in Taiwan. Based on this mission, many research products (such as the analyses of flooding potential and flooding potential maps of Taiwan's major rivers under various rainfall conditions, reviewing and elaborating "Hazard Mitigation Act" and the national level hazard mitigation system had been transferred to

related administrative agencies for reference and application. Besides, to further implement these research products in practices, the NAPHM chose Taipei city as a demonstration site in May, 2000, to create an Office for Hazards Mitigation Planning and to begin a two-year program with Taipei city government. This program will assist Taipei city to proceed with many tasks, such as flooding potential analysis and scenario simulations; landslide hazards potential and risk assessment, and the planning of monitoring systems; the installation and application of HAZ-Taiwan; establishment of emergency management support system; elaboration of local hazard mitigation plan; and the planning of hazard mitigation organization and system. The experience and results of this cooperative program will serve as a reference model to other counties and cities in Taiwan, to promote and implement the practice of research results in science and technology for hazard mitigation.

3. Enhancement of community and civilian organizations

Communities and civilian organizations are important parts of the whole hazard mitigation system. Right after the Chi-Chi Earthquake struck Taiwan in 1999, Taiwan's communities and civilian organizations mobilized many volunteers into the disaster areas, and vast amount of money and materials were donated to the victims. Their contribution was hard to be ignored. Since then, this momentum is still going on, through different means to enhance their roles and functions in disaster prevention and response tasks. Here are some examples:

1) Community organizations and civilian groups help restorations after the disaster

After the Chi-Chi earthquake, many NPOs didn't leave disaster areas. By setting up working stations and visiting disaster areas regularly, they continuously work with community organizations to care the elder and disabled population, to help restoring industries, to initiate recovering of the physical environments. Many experiences and capacities are accumulated for restoration of large-scale disasters.

2) Enhancement of the emergency response capability of community organizations and civilian groups

Based on experiences from the Chi-Chi earthquake, many civilian groups have learned to mutually utilize their resources (such as the professional skills of emergency response and funds) in order to enhance their emergency response capabilities when a large-scale earthquake occurs. In addition, through the assistance of government's emergency management teams, more than 20 communities have each established a local "neighborhood emergency response team". They receive training in emergency management and response regularly; when a disaster strikes, they are now able to start the first-moment emergency response actions at the community level.

3) Toward the building of sustainable community

In addition to the enhancement of emergency management and response capabilities, some communities recognize the importance of sustainable development. They attempt to build their sustainable communities by considering and physically promoting actions such as the transforming of community industries, holding the learning sessions of community mitigation and culture restoration.

CONCLUSION :

This paper summarizes major improvement and enhancement of hazard mitigation tasks in Taiwan in recent 2-3 years, including the elaboration of laws and regulations by administrative agencies, the establishment of organizations and system, the formation and enhancement of civilian and community organizations, and the assistance of hazard mitigation tasks through research in science and technology. After all, it is recognized that every level and dimension have aggressively joined the efforts. However, there are still some problems existing in these efforts that have caused the results not to be as significant as they should:

- The sub-ordinances and relating regulated of “Hazard Mitigation Act” have not yet been elaborated or revised.
- Many “Local hazards mitigation plans” at the County/City and Township/Shiang levels need to be revised in a short time.
- There are still large numbers of hazard mitigation related science and technology research waiting to be done, especially on the issues of socio-economic and cultural aspects. The database of hazard mitigation research and practice is not yet established.
- Although there are some communities and civilian groups thinking highly of and participating in hazard mitigation tasks, yet the number is still relatively small.
- Many people don’t know much about the idea of hazard mitigation and sustainable development, even some of the administrative officials responsible for decision-making lack correct concept and sufficient knowledge about disaster prevention and response.

Even though there are problems existing, comparing to the days without the elaboration of “Hazard Mitigation Act” and the establishment of NAPHM, or without the accumulation of emergency management and response experiences from the Chi-Chi Earthquake, Taiwan has made a big step toward the right direction in hazard mitigation. It is extremely important for the administrative agencies and hazard mitigation related academic organizations to develop from the existing basis, to precisely understand the characteristics and mechanisms of large scale disasters happened before, to communicate with other countries with rich hazard mitigation and response experiences in order to develop policies and strategies suitable for Taiwan’s native conditions, and, most importantly, to provide a safe and sustainable living environment for the people of Taiwan.

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