

Chapter 4

Typhoon Morakot and Institutional Changes in Taiwan

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Abstract Typhoon Morakot hit Taiwan in 2009 with numerous rainfalls and caused nearly 700 deaths from mudslides and huge agricultural losses that have been estimated to be reaching NT\$14.59 billion. For reconstructing the damaged buildings, traffic and houses and avoiding the same problems happen again, some institutional changes were made in post-Morakot period. The major changes include amending law and establishing new organizations to reduce problems like unclear responsibilities because of the overlapping affairs. Briefly speaking, the major changes are replacing “National Fire Agency” (NFA) by “National Disaster Prevention and Protection Agency” (NDPPA) as a professional institution in dealing with future disasters and gives emphasize on the role of local governments, establishing “Special Reconstruction Regulation for typhoon Morakot” to supply more financial support for houses or industries reconstruction, amending “Disaster Prevention and Protection Act” to make the whole disaster managing system more consistently, combining the “Central Disaster Prevention and Response Council” and “National Disaster Prevention and Response Committee” to reduce the problem of affairs overlapping, and establishing “Office of Disaster Management” to supervise central and local governments to execute disaster prevention and response plans.

Keywords Disaster Prevention and Protection Act • Morakot • Taiwan

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4.1 Preface

Owing to the rapid global climate change and special geographic environment makes Taiwan encountering different disasters in past years. In past decades, there are many disasters which brought serious damages to Taiwan's society, such as the 921 earthquake, Typhoon Xangsane, Nari, and Morak etc. The issues of disaster management then become the public and media focus.

According to the study result (Natural Disaster Hotspots: A Global Risk Analysis) that provided by World Bank, Columbia University and the members of ProVention Consortium, it identifies that Taiwan may be the place on Earth most vulnerable to natural hazards, with 73 % of its land and population exposed to three or more hazards. In order to deal with disasters, the Taiwan government flung into disaster prevention institution development as the guideline for disaster prevention management.

The chapter compiled information on disaster included "921 Taiwan Chi-Chi Earthquake, 1999," "Morakot Typhoon, 2009," "Tsunami in South Asian, 2004," "Pakistan Flood, 2010," "New Zealand Earthquake, 2011," "Tohoku Earthquake and Tsunami, 2011," "Thailand Flood, 2012," and generalize the trend of global disasters from a collection of disaster instances:

- The effects of nature disasters unlike the previous that humans have met before.
- The loss and damage of nature disaster much higher.
- There are more and more complex disasters.

Furthermore, the chapter also compiled information on disaster prevention governance and institutional from England and America. The statement is as follows.

4.1.1 *England*

In order to deal with disasters, the England government established Civil Contingency Secretariat (CCS) to promote teamwork and cooperation with non-governmental organization and government. In addition, the government completed Civil Contingence Act and build-up and development UK Resilience to strengthen the ability of disaster management.

4.1.2 *America*

In order to deal with huge disasters, the America government established Federal Emergency Management Agency (FEMA) in charge of programming disaster reduction, disaster preparedness countermeasures, disaster response and recovery strategies. It combined several independent departments that relate to disaster prevention to achieve objective of centralize command and program for disaster management.

In order to deal with disaster, the government program and execute the mission of disaster prevention by National Fire Agency, Ministry of the Interior in Taiwan.

When mass casualty incidents happened, the central administrative Command Post (ACP) plays the role as a coordinator who requested resource assistance directly to the Central Emergency Operation Center (CEOC). Local government's Emergency Operation Center (EOC) is the mainly in charge of providing all sufficient rescue resources and dispatching relief manpower supplies for the local Incident Command Post (ICP).

On purpose to acquaint readers with the disaster prevention governance and institutional changes in Taiwan, the chapter passed an opinion by adopting literature survey with Morakot Typhoon as below.

4.1.3 Case Introduction

Typhoon Morakot, a devastating tropical cyclone that caused critical landfall in Taiwan during August 7–9, 2009, had reached highest recorded rainfall in southern Taiwan in the past 50 years. The path of Morakot Typhoon is plotted as shown in Fig. 4.1 and the radar echo during 00:00 7-August, 2009 to 00:00 10-August, 2009 as shown in Fig. 4.2.

August 2, 2009, Japan Meteorological Agency (JMA) reported that a tropical depression formed and about 1,000 km far from eastern Philippines. However, the depression remained weak, and was an area of convection with deep convection flaring on the western of a partially exposed low level circulation center. Later on August 4, Central Weather Bureau of Taiwan reported that the tropical depression named Morakot located at eastern Philippines turned into a tropical storm and would likely invade southern Taiwan in a nearly future. The progresses of Morakot in Taiwan are listed as below:

1. August 5, 2009 20:30: Central Weather Bureau of Taiwan issued a Sea Typhoon Alert for Morakot.
2. August 6, 2009: Severe Tropical Storm Morakot intensified into a typhoon, closed to Taiwan but moved very slowly, and embedded in a large-scale convection region with monsoon circulation.
3. August 7, 2009: Morakot caused landfall in Hualian near midnight.
4. August 8, 2009: After midnight, most of the districts in southern Taiwan recorded heavy rainfall.
5. August 9, 2009: News indicated that Xiaolin village, a mountain village with 1,300 residents in Jiashian Township, was hit by mudslide. The entire village was nearly razed to the ground by the mudslide and only two buildings still remained. Over 600 residents were buried alive.

4.1.3.1 Rainfall

Southern Taiwan was seriously hit by the typhoon with up to 3 m of rainfall during August 7 and 8. Typhoon Morakot invaded Taiwan with record-breaking rainfall

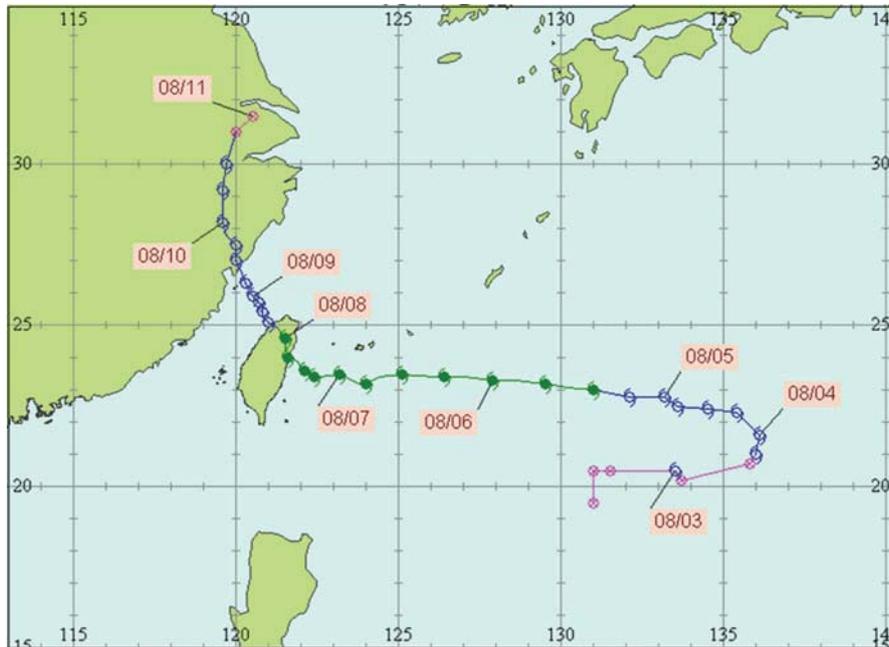


Fig. 4.1 The path of Morakot Typhoon (Data source: Central weather Bureau, Taiwan)

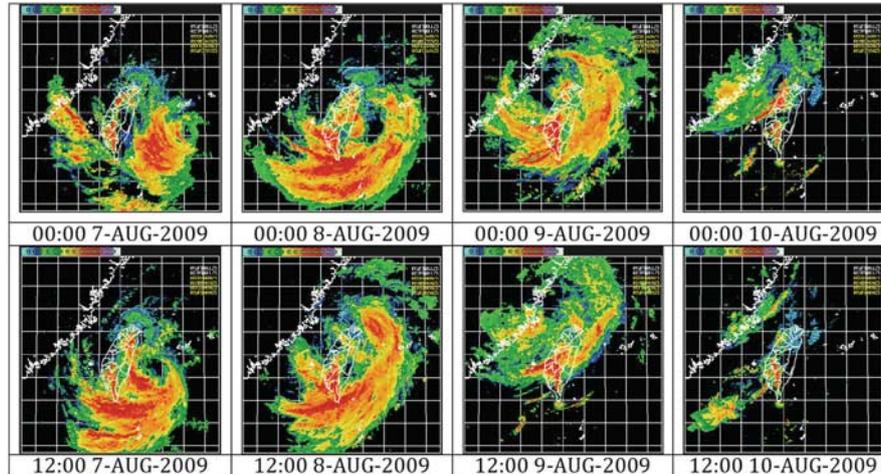


Fig. 4.2 The radar echo during 7–10-Aug (Data source: Central weather Bureau, Taiwan)

and strong winds which was estimated up to 13 (Beaufort scale), resulted in great loss of many lives and properties.

After Morakot landed in the midnight of August 8, almost the entire southern region of Taiwan (Chiayi County, Chiayi City, Tainan County, Tainan City, Kaohsiung County, Kaohsiung City, Pingtung County and parts of Taitung County

and Nantou County) were flooded by record-breaking heavy rain. The rainfall in Pingtung County exceeded 2,600 mm (100 in), breaking all rainfall records of any single place in Taiwan induced by a single typhoon.

According to Water Resources Agency, Ministry of Economic Affairs in Taiwan, the precipitation from typhoon Morakot in these 2 days was exceeded half-yearly average in partly areas.

4.1.3.2 Impacts

During the devastated typhoon Morakot, a serious, heavy rainfall caused a deadliest mudslide in Xiaolin village, Jiasian Township of Kaohsiung County, and it resulted in nearly 700 death and thousands of people homeless.

News indicated that at least 600 people were missing in southern Taiwan. Most were residents of Xiaolin, a mountainous village with 1,300 residents in Jiasian Township. The village was destroyed by a massive mudslide and most parts were buried under a huge mudflows and landslides. It was also reported that all roads toward Namaxia Township were either blocked or washed away by severe mudslides. The deadly catastrophe lead to hundreds of residents trapped for 4 days. Survivors almost ran out of food and water. In addition, water and electricity were cut those days. It was estimated that more than 600 people died in the village due to sudden mudslide, and only two buildings remained standing in the village. A rescue helicopter, working to retrieve survivors of the mudslide crashed in early August 11, and killed three occupants. Crews were unable to reach the wreckage due to the steep terrain.

Meanwhile, around 1,000 people in Taoyuan township and 1,500 in Namasiya township were trapped, according to an emergency operation centre in Chiayi on August 14, there were still over 10,000 people trapped in the townships of Alishan, Meishan, Chuchi, Jhongpu and Fanlu. Taipei Times reported that a primary school teacher was stranded for 6 days in Jinfong township in the mountainous Taitung County, before sending a desperate email calling for help. The email explained that over 1,000 people were cut off by a massive mudslide and survivors were under starvation.

In general, typhoon Morakot caused nearly 700 deaths from mudslides and huge agricultural losses that have been estimated to be reaching NT\$14.59 billion.

4.2 Institutional Changes on Disaster Prevention and Protection in Post-Morakot Period

There are five major institutional changes after typhoon Morakot happened. The differences between the two periods, pre- and post- Morakot periods are shown in Table 4.1 and the reasons and contents are explained in paragraphs below.

Table 4.1 Institutional changes after typhoon Morakot happened

Change	Period	
	Pre-Morakot period	Post-Morakot period
Change on the government organization in charge of disaster management	Fire Agency	Disaster of Prevention and Protection Agency
Change on the act	Disaster Prevention and Protection Law	1. Disaster Prevention and Protection Law is amended 2. Special Reconstruction Regulations for Typhoon Morakot is announced
Change on the decision-making organization	Central Disaster Prevention and Response Council and National Disaster Prevention and Response Committee	Central Disaster Prevention and Response Council
Change on the staff member	None	Office of Disaster Management

4.2.1 Planned Establishing Disaster Prevention and Protection Agency

In Taiwan, National Fire Agency Ministry of Interior is the major organization for the objectives to complete a sound public safety and disaster prevention system. The missions are to improve emergency medical service, to promote professional fire prevention and fighting service, to enhance disaster rescue efficiency and to protect civilian life, property and safety. It was established on March 1, 1995 to be responsible for fire prevention, disaster rescue and emergency medical service. According to “The Organization Act of National Fire Agency, Ministry of the Interior” (2005.06.22 Amended), National Fire Agency (NFA) plans and carries out affairs of national fire prevention agency, disaster prevention and rescue; and is authorized to command and supervise national fire institutes to perform fire prevention and disaster prevention and rescue missions.

In the study of National Policy Foundation, executive institution of central disaster protection affairs should be “National Disaster Prevention and Protection Agency Ministry of Interior.” But in the Organic Act of Ministry of Interior, only NFA is established for national fire administrative affairs. NFA also commands and supervises national fire institutes, and that is the reason why people misunderstand it only charges the fire affairs. Therefore the Disaster Prevention and Protection Agency (NDPPA) has to be oriented an executive institution, and Disaster Prevention and Protection Council and National Disaster Prevention and Response Committee have to be in charge of governmental rescue system coordination.

As the background of NFA still emphasized the stages of preparation and response and had not developed complete disaster prevention functions (Hsiung et al. 2010), the idea of replacing NFA by NDPPA was born after typhoon Morakot

happened. In the press conference on August 18, 2010, President mentioned to establish NDPPA to substitute NFA as a professional institution in dealing with future disasters. Besides, local governments have to establish Disaster Prevention and Protection Bureaus to operate disaster prevention system effectively. Military also join disaster prevention activities as well. Before the press conference, Disaster Prevention and Protection Act (2000.7.19 announced) was amended on August 4, 2010. The amended content is including article 7 and 16. In amended article 7, it regulates “National Disaster Prevention and Protection Agency, Ministry of the Interior shall execute disaster prevention and protection business.” And in amended article 16, “To deal with the response affairs of major disaster rescue, the National Disaster Prevention and Protection Agency of Ministry of the Interior shall establish the Special Search and Rescue Team and the Training center; while the municipal or county (city) government shall establish a search and rescue organization.” is regulated. In these articles, the noun NDPPA is used rather than NFA. The variation also makes the Organic Act of Ministry of Interior has to be amended, and the amended draft is examined by The Legislative Yuan now (December, 2012).

In the meeting called for examining the personnel employment system after NFA substituted by NDPPA, it also concluded that in addition to the original functions of NFA, NDPPA should establish more systems in the future for raising the quantity of disaster prevention staffs, such as (1) to establish the department of mountain disaster prevention to deal with events happened in the mountain; (2) to evaluate the possibility of establishing the college of disaster prevention which belong to Central Police University to educate professional disaster prevention personnel and raise their quality.

But after NDPPA replaces NFA, some problems appear. The study of Research, Development and Evaluation Commission, Executive Yuan (2010) mentioned opinions below:

1. Although NDPPA is recharged in disaster prevention affairs, its functions overlap with Ministry of Economic Affairs, Council of Agriculture, Ministry of Transportation and Communications, and Environmental Protection Administration. Relations between each other need to be distinguished.
2. Probability of complex disasters increase year by year, so NDPPA should be responsible for communication and coordination with different institutions when a disaster happens. NDPPA is the third grade institution of Executive Yuan but it needs to lead other second grade institutions. This violates the designation of administrative organization levels and should be adjusted.
3. The central disaster prevention and protection affairs are all managed by NDPPA after Disaster Prevention and Protection Act was amended. But in professional opinion, two different fields of disaster and fire should be separated and managed by different institutions.

In this period, climate change makes more instantaneous and strong disasters happen. That is why even it is doubted the reasonability and necessity to establish NDPPA, the responsible disaster prevention and protection institution still need to exist.

4.2.2 Established Special Reconstruction Regulation for Typhoon Morakot

After typhoon Morakot hit Taiwan, it not only destroyed large parts of buildings in disaster areas but affected people's life. For the reconstructions of home country, facilities, industries, life and culture in disaster areas, "Special Reconstruction Regulations for Typhoon Morakot" was submitted by Executive Yuan on August 20, 2009. After consideration, Legislative Yuan passed the law on August 27, 2009 and declare by president on August 28, 2009.

The articles of this regulation are about reconstruction, including supplying financial support and loans for houses rebuilding; supplying low-price of health insurance for farmer and labor and bailing out the industries or enterprises which run into difficulty in business operation. In a word, there were little restrictions when implementing reconstruction of traffic, transportation and other public works.

Reconstruction should be oriented on humans and their life. Because large parts of disaster areas are aboriginal districts, the multiple cultural characters need to be respected and communities should participate in reconstruction works. Therefore reconstruction should respect people, community or tribe organization, culture and life style of disaster areas.

4.2.3 Amended the Disaster Prevention and Protection Law

After typhoon Morakot, Executive Yuan passes partly of Disaster Prevention and Protection Act on November 19, 2009 and passes by Legislative Yuan after Third Reading on July 1, 2010. Amended articles included:

- Enhance the Disaster Prevention and Protection duties of local governments, and added the local governments Autonomy of Disaster Prevention by rule.
- Integrate the "Central Disaster Prevention and Protection Council" and the "office of disaster management," fortifying disaster prevention and protection policies and measurements. National Disaster Prevention and Protection Agency, Ministry of the Interior shall execute disaster prevention and protection business.
- Amend the articles of 9 and 10: The municipal, or county (city) office of disaster management shall deal with the affairs of the municipal, or county (city) disaster prevention and protection council. The organization is enacted by the municipal, or county (city) government.
- Add the articles of 23: To insure the stream transmission of microwave communication for succeeding the responsive measures of disaster rescue, an efficient wireless transmission distance range shall be enacted and publicized duly by the Ministry of the Interior.
- Add the articles of 34: The Ministry of National Defense shall mobilize reserved servicemen's organizations to support responsive measures of major disaster

rescue as provided in the preceding paragraph. The procedures for requesting rescue support or active support for responsive measures of disaster rescue from national army, arrangement and dispatch of national defense force, commanding and coordination, negotiation and communication, education and training of disaster rescue affairs, the schedule of duty operation and other relevant operation regulations as prescribed in the fourth paragraph therein shall be duly enacted jointly by the Ministry of National Defense and the Ministry of the Interior.

4.2.4 Combined the Central Disaster Prevention and Response Council and National Disaster Prevention and Response Committee

In pre-Morakot period, there were two central disaster prevention and protection institutions which were in charge with decision making, and these are Central Disaster Prevention and Response Council and National Disaster Prevention and Response Committee. Their former functions were below:

4.2.4.1 Central Disaster Prevention and Response Council

- (a) Decide basic principles of disaster prevention and response.
- (b) Approve the disaster prevention and response basic plan and operation plan.
- (c) Approve important disaster prevention and response policy and measure.
- (d) Approve the nationwide emergency disaster contingency measures.
- (e) Supervise and evaluate the central, municipal and county (city) disaster prevention and response related matters.
- (f) Other matters regulated by law.

4.2.4.2 National Disaster Prevention and Response Committee

- (a) Execute disaster prevention and response policies approved by Central Disaster Prevention and Response Council; promotes major disaster prevention and response tasks and measures.
- (b) Plan the basic principle of the disaster prevention and response.
- (c) Draw up of disaster prevention and response basic plans.
- (d) Review disaster prevention and response operation plans.
- (e) Coordinate unsolved contradicted matters in disaster prevention and response operation plans against regional disaster prevention and response basic plans.
- (f) Coordinate with financial institutions about reconstruction fund.
- (g) Supervise, evaluate, and coordinate disaster prevention and response measures of all levels of government.
- (h) Other matters regulated by law.

4.2.4.3 The Reason to Combine the Two Organizations

The Central Disaster Prevention and Response Committee executive the policy of disaster prevention, but in the practically, the committee didn't stem from law. It only was a guideline. The committee assemble was by mission orients, there are so difficult to dedicate that promote disaster prevention policy.

Due to some functions of Central Disaster Prevention and Response Council and National Disaster Prevention and Response Committee overlapped, when a large scale disaster happened, those institutions couldn't integrate effectively. So it made the rescue process too complicated.

Ministry of the Interior mentioned typhoon Morakot destroyed central and southern Taiwan and revealed the severity of climate change. It showed that the challenge from natural disaster is more and more strict. The points to amend Disaster Prevention and Protection Act were how central and local governments coordinate and cooperate when facing large scale and complex disasters and how instantly and actively military support rescue work.

To solve the problems of functions overlapping, "Central Disaster Prevention and Response Council" and "National Disaster Prevention and Response Committee" were combined as Central Disaster Prevention and Response Council. For raising professional functions, the Office of Disaster Management was also established with professional personnel in Executive Yuan. It was predicted to promote the administration efficiency of disaster prevention and protection of central organizations. As Fire Agency is replaced by Disaster Prevention and Protection Agency, it will form a whole disaster prevention system. The system includes Central Disaster Prevention and Response Council to make decisions, Office of Disaster Management to supply professional advices, and Disaster Prevention and Protection Agency to execute affairs.

4.2.4.4 Functions After Combining

In accordance with the amended guidelines to set up the "Central Disaster Prevention and Response Council," the Council's missions maintained like before.

After two institutions combined, Central Disaster Prevention and Response Council held a meeting from one time per year to one time per 3 months. Including Disaster Prevention and Protection Agency, Professional Advisory Committee of disaster reduction, National Science and Technology Center for Disaster Reduction and National Search and Rescue Command Center should attend the meeting. If necessary, the Council can invite representatives of local governments, experts or scholars to attend the meeting.

4.2.5 Established the Office of Disaster Management

4.2.5.1 The Purpose to Establish the Office

Taiwan is located at western Pacific and Circum-Pacific Seismic Zone, which is frequently affected by typhoons. It is suffered from an average of three to four typhoons every year in this century and also has a threat of earthquake. Life and property caused by disasters grew due to the rapid growth of economic and changes of society. For this reason, improving disaster prevention and response mechanism becomes a vast goal for the government. However, it needs some more innovative thoughts to face the trend of diversified disaster with complexity. As a result, Executive Yuan of Taiwan established “Office of Disaster Management” after the disaster from typhoon Morakot.

4.2.5.2 Members of the Office

The Office of Disaster Management is under Executive Yuan of Taiwan. It has a chief who directs and supervises all affairs of the office, and has a vice chief. The office deals with issues such as typhoon, flood, landslide, earthquake, toxic chemicals, and serious explosion etc, therefore all staffs need to be transferred from other professional organizations such as fire control, country defense, information, geography, sanitation, civil engineering, water conservancy, conservation of water and soil, psychology, society, and economic.

4.2.5.3 Functions of the Office

The office deals with affairs related Central Disaster Prevention and Response Council and Central Disaster Prevention and Response Committee and those like below:

1. Draw up disaster prevention and response policy; promotes major disaster prevention and response tasks and measures.
2. Supervise each grade of governments to execute disaster prevention and response decided by Central Disaster Prevention and Response Council and Central Disaster Prevention and Response Committee.
3. Draw up disaster prevention and response basic principle and basic plan.
4. Examine elementarily disaster prevention and response operation plans and local disaster prevention and response plans.
5. Suggest laws related to disaster prevention and response to amend.
6. Assist to supervise the disaster warning, monitoring and announcing systems.
7. Assist to supervise the disaster preparing, educating, training and announcing.

8. Plan the emergency response system.
9. Assist to supervise post-disaster investigation and recovery.
10. Other matters about disaster prevention and response policy-drawing up and affair-supervising.

4.3 Conclusions

After Disaster Prevention and Protection Act amended, [Office of Disaster Management](#) presented the adjustment content of central disaster prevention and protection organizations. Article 7 of the amended act regulates that the central disaster prevention and protection organizations include (1) Central Disaster Prevention and Response Council, (2) National Disaster Prevention and Response Committee, (3) Office of Disaster Management, (4) Professional Advisory Committee of disaster reduction, (5) National Science and Technology Center for Disaster Reduction, (6) National Search and Rescue Command Center and (7) National Disaster Prevention and Protection Agency Ministry of Interior.

Each regulation to adjust central disaster prevention and protection organizations is announced on December 2, 2010 except Amended draft of Organic Act of Ministry of Interior is examined by The Legislative Yuan now. The central disaster prevention and protection system figures before and after Disaster Prevention and Protection Act amended are shown in Figs. 4.3 and 4.4. The major system changes in pre- and post-Morakot period are described below:

1. The National Disaster Prevention and Response Committee works in Fig. 4.3, but ceases working in Fig. 4.4. The original functions are executed by Central Disaster Prevention and Response Committee.
2. Professional Advisory Committee of disaster reduction, National Science and Technology Center for Disaster Reduction, National Search and Rescue Command Center and National Disaster Prevention and Protection Agency Ministry of Interior are not requested to attend the Central Disaster Prevention and Response Council in Fig. 4.3 but do in Fig. 4.4.
3. There is not a staff member in the original system to supervise the Council and Committee in Fig. 4.3. But in Fig. 4.4, Office of Disaster Management plays the role.
4. National Search and Rescue Command Center belongs to Executive Yuan in Fig. 4.3, but belongs to Central Disaster Prevention and Response Committee in Fig. 4.4 after Disaster Prevention and Protection Act was amended.

After typhoon Morakot happened, not only some acts amended but also the system changed. The key point is to reduce many affairs overlapping in different institutions. By strengthening power of regulating authorities and avoiding unnecessary coordination, major organizations of disaster prevention and protection have more energy to reduce, prepare, response and reconstruct when disaster comes. In this way, when facing future disasters, reconstruction works in Taiwan can be relied on faster help from governments and local groups such as religion groups to shorten reconstruction periods.

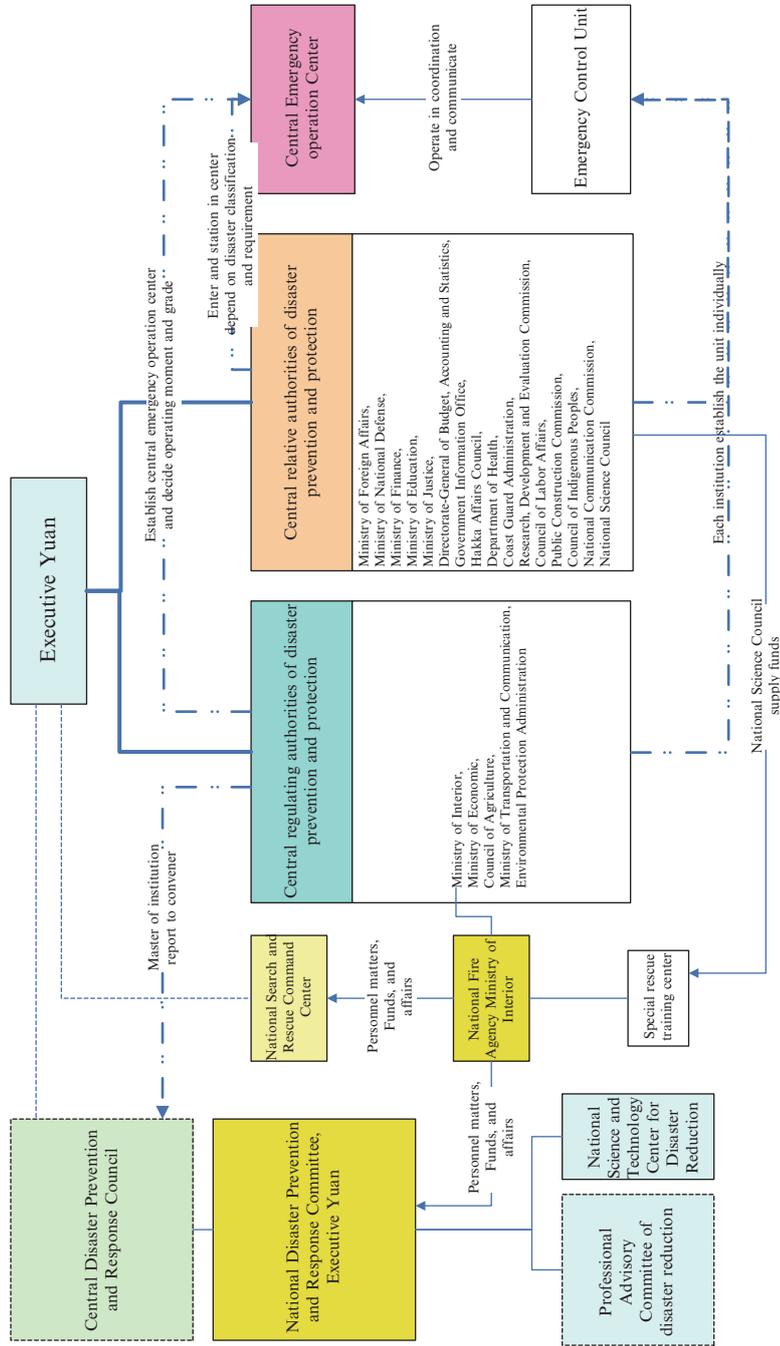


Fig. 4.3 The central disaster prevention and protection system figures before Disaster Prevention and Protection Act amended

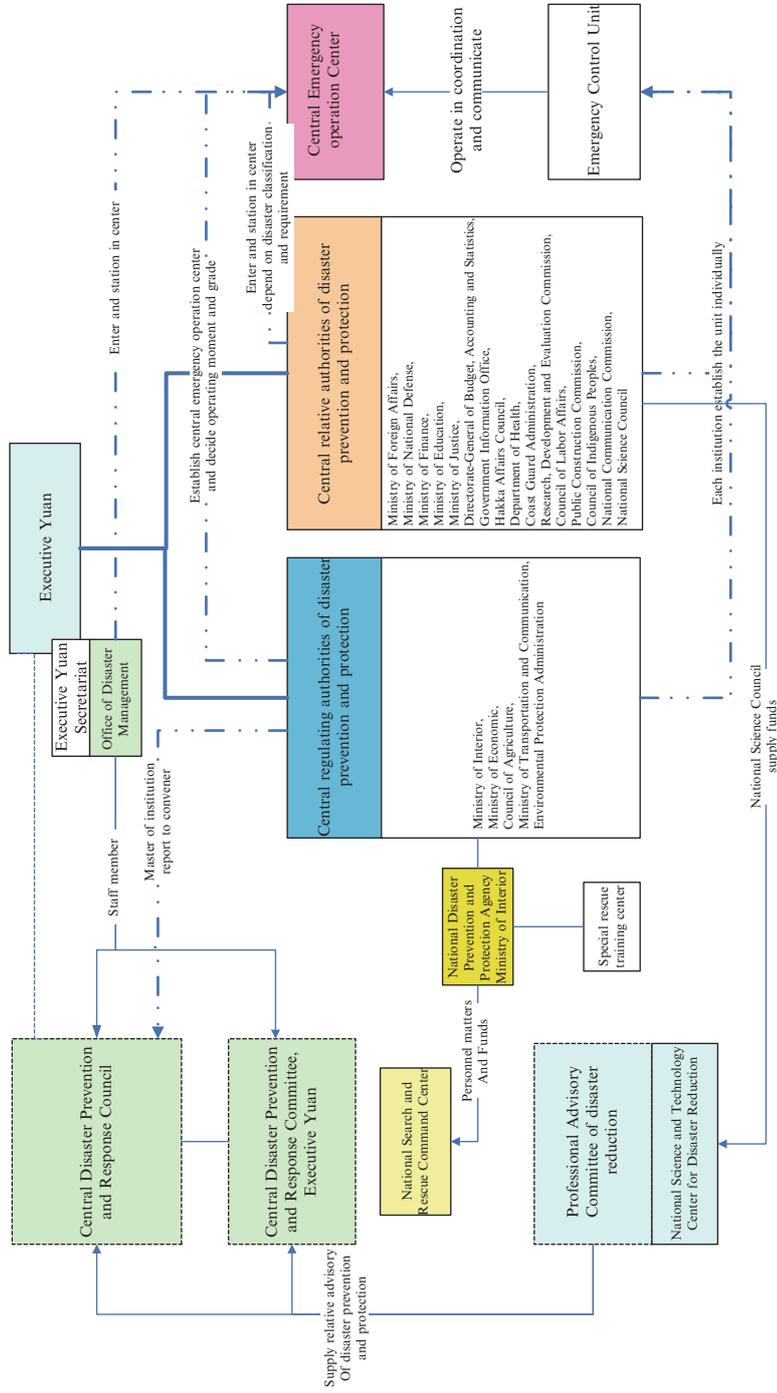


Fig. 4.4 The central disaster prevention and protection system figures after Disaster Prevention and Protection Act amended

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