

Emergency Response Principles of Typhoon Disaster

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Abstract

Since 2003, China has made extraordinary achievements in emergency management, and successfully dealt with a large number of unexpected events, especially meteorological disasters. At the same time, a complete system of emergency laws, regulations and plans are gradually established. Through reviewing those official documents, this paper finds out four important principles that typhoon disaster emergency responses follows: warning level based, disaster consequences and types oriented, unified leadership and departmental response, decentralized response and localized management.

Keywords

Typhoon Disaster, Warning Level Based, Consequences and Types Oriented, Unified Leadership and Departmental Response, Decentralized Response and Localized Management

1. Introduction

Typhoon disaster is a natural disaster that refers to the formation of tropical and Subtropical Ocean cyclonic eddies in a wide range of activities with strong wind, rainstorm, storm tide and waves, which may cause damage to human life and properties¹. Along with the occurrence of natural disasters, a series of other disasters often followed. This phenomenon is called disaster chain. Within disaster chain, the earliest disasters are named primary disasters, which may lead to secondary disasters. And when the harmonious condition of human existence is disrupted and a series of other disasters aroused, derivative disasters appear. Typhoon disasters often lead to a series of secondary and derivative disasters, such as debris flow, flood and disease.

Since 2010, China Meteorological Bureau has started various meteorological

¹Natural Disasters Losses Statistical System, 5 Ministry of Civil Affairs (2008).

disasters emergency responses for more than 70 times, such as typhoon, heavy rain and other extreme weather phenomena, amounting to 362 days [1]. Succeeding in dealing with more than 60 typhoons, like “Swallow” and “Nida”, and more than 20 times heavy rainstorms, these emergency responses played an important role in reducing the negative impact on the economic and social development efficiently and effectively. Since then, such a great success has been made. So, what kind of response system does State of China has established? What principles does China’s meteorological disaster emergency response base on?

2. Establishment of Meteorological Disasters Response Mechanism in China

Since 2003, China has been through *Bird Flu*, *Wen Chuan Earthquake* and other public emergencies, which highlights the importance of public emergency management. In January 2006, the State Council issued the *National Emergency Plan*. It defines Public Emergencies as emergencies that suddenly cause or may cause heavy casualties, property loss, destruction of the ecological environment and serious social harms, which would endanger public safety². The public emergencies were divided into four categories: natural disasters, accidents, public health incidents and social security incidents. According to the degree of harm and urgency, and as well as development trend, they are also classified into four levels as Level I (extremely serious), Level II (serious), Level III (slightly serious), and Level IV (generally serious).

On the basis of *National Emergency Plan*, 25 *Special Emergency Plans* and 80 *Government Departmental Emergency Plans* have been established, including a series of *Meteorological Disaster Emergency Plans*. Since 2010, 31 provinces, 95% of the Municipal governments and more than 2200 county-level governments formulated the *Special Emergency Plan* for meteorological disasters. Additionally, a big progress has been made by meteorological departments at all levels which make Meteorological Disaster Plan system more adequate and efficient. Meteorological Bureau has made 5 pieces of meteorological disaster plans, subordinate departments for 71 pieces, the provincial bureaus for 306 pieces, and county meteorological departments for more than 6000 pieces.

The establishment of Meteorological Disaster Plan system marks the initial establishment of China’s emergency response mechanism for meteorological disasters, including typhoon disasters.

3. Principles of Typhoon Disaster Response

China is one of the countries that suffer from natural disasters most frequently in the world, of which meteorological disasters accounts for more than 70%. As the government with the richest experience, Chinese government mainly divides meteorological disaster response level into four as Level IV to Level I. When a strong typhoon, or a super typhoon is expected to land or impact coastal areas in the future, the national meteorological department will launch Level I typhoon

²*National Emergency Plan*, The Central People’s Government of China (2006).

disaster response, marked as Red; when a tropical storm is around the corner, a Blue emergency response will be issued which means Level IV (as shown in **Table 1**).

3.1. Warning Level Based

Chinese government and its functional departments mainly determine the major meteorological disaster response level by the results monitored and forecast by Central Meteorological Observatory [2]. Conventionally, the results will be showed as Warning Signals. According to the approximation of landing time and intensity, Central Meteorological Observatory generally divides the early warning signal into four levels (IV, III, II, I), represented separately by blue, yellow, orange and red (as shown in **Table 1**).

If more than one meteorological disasters occur at the same time, several warning signals would be issued³. Additionally, when there are more than two kinds of meteorological disasters going to occur and the different levels of warning signals have been released, emergency response would be started according to the highest warning level.

3.2. Disaster Consequences and Types Oriented

According to *National Meteorological Disaster Emergency Plan*, the authorities should launch the emergency response in accordance with disaster influence, as well as the secondary and derivative disasters it causes. This laid the basic principle of emergency response mechanism, namely, the disaster consequences and types oriented principle. With wind and rain, storm surges and other weather phenomena, typhoon makes people unable to carry out routine production activities and lead a usual life. Meanwhile, it also could cause floods, landslides and debris flows and other geological disasters. There exists a great possibility for typhoon to arouse disease and other derivative disasters. According to the types of Typhoon's secondary and derivative disasters, there are always several responses would be issued, which is given to considered in *Meteorological Disaster Emergency Plan* (shown in **Table 2**).

Table 1. Typhoon warning and response level.

Warning Level	Color	Meaning	Response Level
Level IV	Blue	May or have been affected by tropical storm within 24 hours, the average wind above Level 6 in coastal areas or the mainland	Level IV
Level III	Yellow	May or have been affected by tropical storm within 24 hours, the average wind above Level 10 in coastal areas or the mainland	Level III
Level II	Orange	May or have been affected by tropical storm within 12 hours, the average wind above Level 10 in coastal areas or the mainland	Level II
Level I	Red	May or have been affected by tropical storm within 6 hours, the average wind above Level 12 in coastal areas or the mainland	Level I

Source: Trial Measures for the Release of Early Warning Signals of Meteorological Disasters.

³*Trial Measures for the Release of Early Warning Signals of Meteorological Disasters*, China Meteorological Administration (2008).

Table 2. Emergency plan related to typhoon disaster.

Consequences	Response Department	Types of Emergency Plan
Causing mass casualties or may lead to sudden public health events	Ministry of Health	<i>National Public Health and Medical Emergency plan</i> <i>National Health Emergency Plan for Natural Disasters</i>
Causing geological hazards	Ministry of Land and Resources	<i>National Plan for Environmental Emergencies</i>
Causing danger to marine vessels and the pollution of the oil spill	Ministry of transportation	<i>National Maritime Search and Rescue Plan</i> <i>China Offshore Oil Spill Emergency Plan</i>
Causing floods	Departments responsible for Anti-floods	<i>State Flood Control and Drought Relief Emergency Plan</i>
Causing city floods	Ministry of Housing and Urban Construction	
Causing agricultural losses	Ministry of Agriculture	<i>Major Agriculture Disasters Emergency Plan</i> <i>Fishery Ship Safety Emergency Plan</i>
causing marine disasters	Marine Department	<i>Storm surge, Waves, Tsunamis and Sea ice Disaster Emergency plan</i>
need for emergency life assistance	Ministry of Civil Affairs	<i>National natural disaster relief emergency plan</i>

Source: Meteorological Disaster Emergency Plan.

3.3. Unified Leadership and Departmental Response

The meteorological disaster response mechanism is closely related to the linear function leadership structure of the government in China. The State Council is the highest administrative institution of meteorological disasters management. Departments under the State Council are in charged of the relevant categories of public emergency management work in accordance with the relevant laws, administrative regulations and their respective duties. Provincial government agencies have the same leadership structures with central government and similar administrative power and responsibilities. Local governments are responsible for all kinds of meteorological disasters in the administrative area, and government departments should start Departmental and Special Plans on their duties.

3.4. Decentralized Response and Localized Management

China's existing Plan system is an across-the-board emergency plan system [3]. Meteorological disaster emergency plan itself is also with multi-classes network structures (as shown in **Figure 1**). According to the influence of meteorological disasters, the response can be divided into national and local level. When disasters are among provincial administrative regions, and will cause huge losses, it is the State Council that decides which emergency response level to start. When the impact is within a province, the local provincial governments will be in charge. After the occurrence of meteorological disasters, the provincial governments shall start the relevant emergency plans and take effective disposal to control the situation at the first time. If they fail, the State Council, then, will take control.

4. Conclusion

After the emergency occurs, the emergency response should be launched in time.

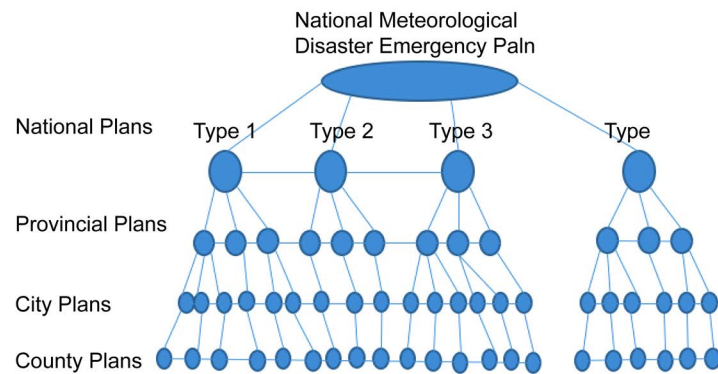


Figure 1. Meteorological disaster emergency plan system.

The start of the emergency response is not without rules; it follows certain principles. The start of the emergency response not only needs to be based on the actual disaster information, negative influence and great losses it may cause, but also needs to be combined with the existing political system and institutional functions of our country. Therefore, by reviewing the *Meteorological Law of People's Republic of China*, *China Meteorological Disaster Emergency Plan* and other relevant laws and regulations, this article outlines emergency response basis and principles of typhoon disaster, through which, it may provide some help for readers to have a better understanding of typhoon emergency response system in China.

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