

Study on the Disaster Relief and Emergency Evacuation Countermeasures of Disadvantaged Minority in Major Disasters in Taiwan

Shyh-yuan Maa (aka Sawyer Mars)*; Yong-jun Lin**; Chi-ying Wu***

Assistant Prof., UPDM, Ming Chuan University*

Assistant Researcher, DRC, National Taiwan University**

Graduate Student, National Taiwan Normal University***

ABSTRACT: Major disaster prevention and protection is a major issue to the governments. Those issues include how to improve the efficiency of the emergency responses, the more inputs of manpower and material resources such as the establishment of related Acts and the system of emergency responses, emergency warning and evacuation order activation system, the enhancement of field emergency operations.

Major disasters not only include the earthquake-related disaster, but also the global warming induced typhoons and accompanied flooding. In August, 2009, typhoon Morakot left more than 700 deaths and injuries in Taiwan. The total agricultural losses reached NTD 16.4 billion, and numerous infrastructures were also destroyed. A few counties and cities are still recovering from that event. The lack of knowledge attributed from the studies referring to the recognition of risk, needs, and behavioral pattern of evacuees make the decisions made by authorities sometimes turn aside from the reality.

The definition of ‘disadvantaged minority’ adopted in this study is ‘disaster disadvantaged minority’ or ‘fragile minority due to disaster’, which is different from the traditional definition. In the words, in addition to the traditional disadvantaged minority (such as disabled, children), the population affected by the disasters temporally and spatially are also added to the definition of ‘disaster disadvantaged minority.’ Those new group are lineated by the locations of their habitation and the relative disadvantaged to disaster-prevention information to meet the accurate definition of policy of evacuation focused on disadvantaged minority.

In a result, to cope with the future needs of mass evacuation due to disadvantaged minority, the data, behavioral pattern, and Acts of Taiwan and foreign countries are collected and analyzed for their advantages and disadvantages. The applicable procedures are then suggested for the reference for the advancement of disaster-prevention and emergency responses.

KEYWORDS: Major Disaster, Disaster-Disadvantaged Minority, Mass Evacuation

1. INTRODUCTION

The regulations of evacuation of disaster-disadvantaged minority (DDM) are regulated at acts, plans, and SOPs of different levels of governments and agencies. The definition of large-scale disasters or DDM and the timing for launching evacuations are lack of national common standards. Table 1 shows the different evacuation level between Taiwan, Japan and U.S. As a result, this study proposes a common framework regarding to operations of DDM for the needs of Taiwan.

Table 1 comparison of evacuation level

Evacuation Level	I	II	III
Taiwan	mandatory	advised	
Japan	instruction	advised	prepared
U.S.	mandatory	recommended	precautionary

Source: author

2. THE EVACUATION PHASES

As for the regulations of evacuation of DDM, governments at all levels generally already have a certain connotation, and the overall work items of each level of governments are roughly described as follows:

Central government level:

The units analyze disaster-related information and monitoring its trends. The information is converted into evacuation recommendations. The relevant competent

authority should assist the Central Emergency Operation Response Center (CEOC) to determine whether city and county governments have the ability and execution to deal with the consequences of disasters.

City/county government level:

The city/county government consults the information provided by the CEOC and combine its own comprehensive judgment for the conducting the evacuation. After the central government announces the suggestion of evacuation, the city/county government is mainly responsible for the implementation and scheduling of evacuation. It evaluates its resources and determines if it can respond the incidents itself or if inadequate, upon request for the support from CEOC and pass the current status to CEOC.

Township government level:

When receiving the order to evaluate from the county/city government, the township government evaluates its resources and determines if it can respond the incidents itself or if inadequate, upon request for the support from the city/county government and pass the current status to the city/county government.

Due to the diversity of different operations of DDM of different level of governments, the central government needs to develop an integrated framework for reference for developing similar regulations. In this paper, systematic planning for

evacuation decisions based on the definition of DDM (including traditional disadvantaged minority) is developed.

In the interviews after typhoon Morakot of officials both in Taiwan's central and local government, the suggested framework referring to the concept of the asylum system in Japan, and the phases of evacuation are divided into four periods:

- preparedness phase;
- precautionary evacuation phase;
- emergency rescue phase;
- recovery phase.

3. COMMON OPERATIONAL SCHEME OF EVACUATION

3.1 Preparedness Phase

3.1.1 Work items of central government

- Establishment working networks: establishment of three-level evacuation instructions (disaster competent authority), establishment and integration communication systems (Ministry of the Interior), the inventory of national evacuation shelters (disaster-competent authority)
- Mutual support agreement between authorities: mutual support agreements of the cities and the counties (Ministry of the Interior), mutual support agreements with the cities and the counties (Ministry of National Defense)
- Declaration of disaster potential information: bulletin of a variety of

disaster potential information (disaster-competent authority)

- The list of DDM: database exchange of lists of a variety of DDMs (Ministry of the Interior, Department of Health, Council of Agriculture, Ministry of Economic Affairs, Indigenous Peoples Council)
- Evacuation planning: determine principles of evacuation of warning-able or not warning-able disasters (disaster-competent authority), and determine principles of out-of-home (disaster-competent authority)
- Drills and review: conduct national drills (disaster-competent authority)

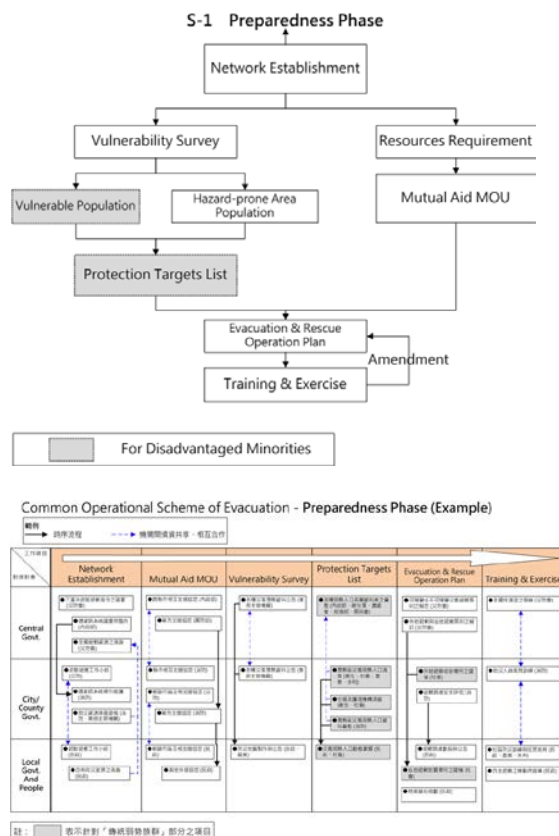


Figure 1 common operational scheme of evacuation of preparedness phase

3.1.2 Work items of municipal/county/city government

- Establishment working networks: evacuation working group (disaster competent authority), operation and maintenance of communication system (Fire department), entry of disaster relief resources (fire and competent departments)
- Mutual support agreement between authorities: mutual support agreements of townships (disaster competent authority), mutual support agreements of cities and counties (disaster, the competent authority), support agreement with Ministry of National Defense agencies (disaster competent authority)
- Declaration of disaster potential information: bulletin of a variety of disaster potential information (competent authority)
- The list of DDM: Establish lists of a variety of DDMs (bureaus of health care, social affairs, agriculture, water resources), inventory of social welfare institutes (bureaus of health care and social affairs), inventory of population of disaster-potential zones (bureau of fire)
- Evacuation planning: Filing of out-of-home evacuation shelters (bureau of social affairs), evaluation of evacuation route (bureau of fire)
- Drills and review: Training of disaster management personnel (bureau of fire)

□

3.1.3 Work items of cities or townships

- Establishment working networks: evacuation working group (section of civil affairs), inventory of disaster relief resources (section of civil affairs)
- Mutual support agreement between authorities: mutual support agreements of townships (bureau of civil affairs), other mutual support agreements (section of civil affairs)
- Declaration of disaster potential information: making and declaration disaster potential maps (sections of civil affairs and agriculture)
- The list of DDM: status of a variety of DDMs (sections of social affairs and civil affairs)
- Evacuation planning: delineate evacuation route and its declaration (section of social affairs), file the local evacuation shelters (section of social affairs), planning of storage of disaster relief resources (section of social affairs)
- Drills and review: drills of community and town men (bureaus of civil affairs, agriculture, water sources), promotion of self-evacuation (bureau of civil affairs)

3.2 Precautionary Evacuation Phase

3.2.1 Work items of central government

- Disaster early warning and intelligence judgments: launch of emergency operation center (disaster competent authority), evaluation and provide the analysis of disaster-related information

to lower level governments (disaster competent authority)

- Preparatory work before evacuation: Ministry of National Defense resources deployment (Ministry of National Defense), equipment or machine pre-deployment (competent authority), the number of people for preventive evacuation (Ministry of the Interior)
- Announcement of preventive evacuation: Recommend evacuation for hazard-prone area (disaster competent authority)
- Execution of preventive evacuation: prediction for closure sections of the bridges and roads under jurisdiction of the central government (Ministry of Transportation) and other sections under the jurisdiction of other authorities (Ministry of Transportation)
- Bridging shelters: numbers of evacuation shelters launched (Ministry of the Interior), and needs of medical care resources from lower level governments (Department of health care)

3.2.2 Work items of municipal/county/city government

- Disaster early warning and intelligence judgments: launch of emergency operation center (disaster competent authority) and notify the launch of emergency operation center of lower level governments, provide disaster-related information to lower

level governments (disaster competent authority)

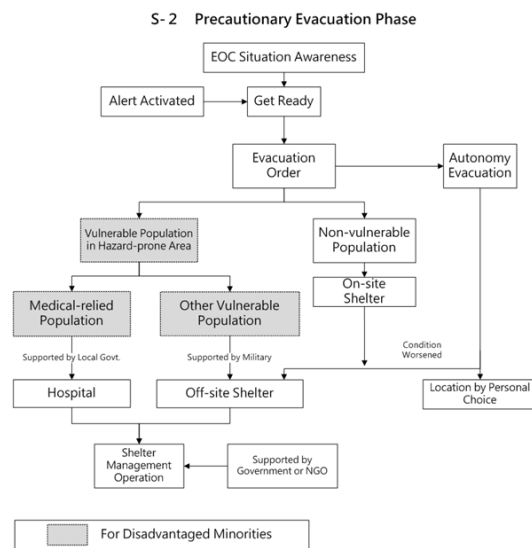


Figure 2 common operational scheme of evacuation of precautionary evacuation phase

- Preparatory work before evacuation: inventory of preparedness of different stakeholders (bureaus of health care, civil affairs, agriculture, water sources)
- Announcement of preventive evacuation: announce the evacuation order to disaster-prone area (disaster competent authority)
- Execution of preventive evacuation: integrate and schedule defense resources to assist in the evacuation (bureau of fire), provide township additional disaster relief resources (disaster-competent authority, health care-competent authority), the status of preventive evacuation (bureau of civil affairs), the prediction of closure sections of the bridges and roads (bureau of transportation)

- Bridging shelters: launch of out-of-home evacuation (bureau of social affairs), resettle the patients of medical care institutions

3.2.3 Work items of cities/townships and townsmen

- Disaster early warning and intelligence judgments: launch of emergency operation center (section of civil affairs)
- Preparatory work before evacuation: the number of self-evacuation persons (section of civil affairs), manage the transportation vehicles provided by the government (section of civil affairs)
- Announcement of preventive evacuation: Preventive evacuation notified by village chiefs
- Execution of preventive evacuation: timing for out-of-home evacuation (mayor), judgment for closure of bridges and roads (competent authority), execution of local preventive evacuation (mayor)
- Bridging shelters: launch of local evacuation (bureau of social affairs)

3.3 Emergency Rescue Phase

3.3.1 Work items of central government

- Monitoring disaster and mobilization support for resources: follow-up the needs for requirements of resource inter-district scheduling (Ministry of the Interior)
- Traffic status and evaluation of stranded persons: the implementation

of closure of roads and bridge closures (Ministry of Transportation), the number of persons who are island-stranded (Ministry of the Interior), the status of secondly evacuation (Ministry of the Interior)

- Assessment of in-danger-zones: predict future rainfall and analyses the consequence of disasters
- Execution of evacuation: provide the resources for evacuation by airborne (Ministry of the Interior, Ministry of National Defense) and resources for evacuation ground (Ministry of National Defense)
- Bridging shelters: status of the shelters



3.3.2 Work items of municipal/county/city government

- Monitoring disaster and mobilization support for resources: request for outsourcing (disaster-competent authority)
- Traffic status and evaluation of stranded persons: the implementation of closure of roads and bridge closures (bureaus of police and transportation), evaluate the status of health conditions of stranded persons (bureau of health care)
- Assessment of in-danger-zones: analyze consequences of disaster of municipal/county/city (disaster-competent authority), the safety assessment of local evacuated persons (disaster-competent authority, competent authority)

- Execution of evacuation: set up on-site command center (Bureau of fire), search and rescue of trapped persons (Bureau of fire), support evacuation operations of townships (disaster-competent authority)
- Bridging shelters: support the operations in the shelters (Bureau of social affairs), launch of extra shelters (Bureau of social affairs and Ministry of National Defense)

affairs), reopen of major roads (section of public works)

- Bridging shelters: operate the shelters (section of social affairs), food supply and lifeline support (section of social affairs)

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3.4. Recovery Phase.

3.4.1 Work items of central government

- Safety assessment of villages: field trip of experts for safety assessment of villages (NSC)

- Maintenance the operation of shelters: status of shelters (Ministry of the Interior), provide extra supports (Ministry of the Interior)

- Up-scaling or down-scaling of resettlement: responds to massive resettlement (Ministry of National Defense, Ministry of the Interior)

- Recovery operations: Inter-district support force task teams (Ministry of the Interior)

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3.4.2 Work items of municipal/county/city government

- Safety assessment of villages: field trip of experts for safety assessment of villages (disaster-competent authority)

- Maintenance the operation of shelters: operation of out-of-home evacuation (Bureau of social affairs)

- Up-scaling or down-scaling of resettlement: responds to massive resettlement (disaster-competent authority)

- Recovery operations: assist in

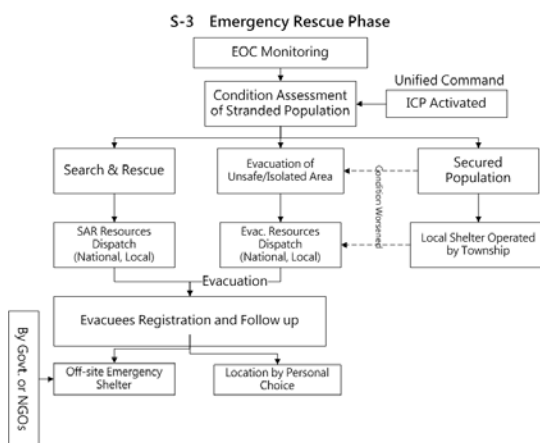


Figure 3 common operational scheme of evacuation of emergency rescue phase

3.3.3 Work items of cities/townships and townsmen

- Monitoring disaster and mobilization support for resources: Report the status of disaster (section of civil affairs)
- Traffic status and evaluation of stranded persons: safety assessment of on-site shelters (section of civil affairs)
- Assessment of in-danger-zones: medical care of intensive patients and wounded (sections of fire and policy)
- Execution of evacuation: implement on-site evacuation (section of civil

environmental cleaning (Bureau of environmental protection), assist in providing transportation vehicles (Bureau of transportation)

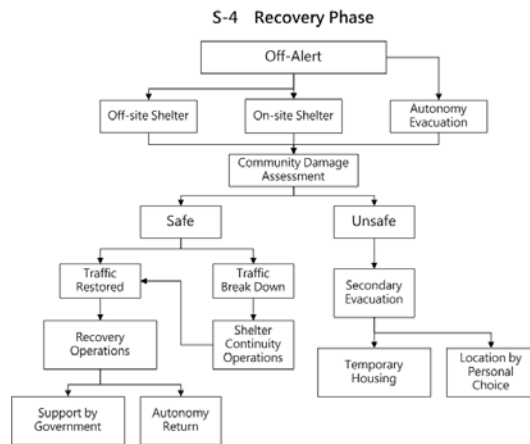


Figure 4 common operational scheme of evacuation of recovery phase.

3.4.3 Work items of cities/townships and townsmen

- Safety assessment of villages: involve the field trip of experts for safety assessment of villages (sections of agriculture, and public works)
- Maintenance the operation of shelters: operate the on-site shelters (section of social affairs)
- Up-scaling or down-scaling of resettlement:
- Recovery operations: assist in environmental cleaning (section of environmental protection)



CONCLUSION

The definition of ‘disadvantaged minority’ adopted in this study is ‘disaster disadvantaged minority’ or ‘fragile minority

due to disaster’, which is different from the traditional definition. In the words, in addition to the traditional disadvantaged minority (such as disabled, children), the population affected by the disasters temporally and spatially are also added to the definition of ‘disaster disadvantaged minority.’ Those new group are lined by the locations of their habitation and the relative disadvantaged to disaster-prevention information to meet the accurate definition of policy of evacuation focused on disadvantaged minority.

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