

# Revising a regional disaster management plan using ethnographic data

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## Abstract

The present study examined disaster response activities written in a regional disaster management plan of a municipal government in Tokyo. The purpose of this study was to propose a method to improve the plan, formulating a consensual decision making process where municipal officials check and validate their response activities in the plan. During this process, we indicated that response activities in the plan were divided into three categories: 1) general administration, employing standard skills but increased workload, 2) activities unique in a disaster, and 3) activities which are misallocated. We therefore identified which activities should be focused on. The next step was to implement operational simulation training, using ethnographic data obtained from interviews of responders in previous disasters. Acquired operational understanding through the conventions helped officials judge how the disaster management plan should be revised. Consequently, we clarified necessary modifications in the plan. Participants felt that municipal disaster preparedness was enhanced.

*Keywords: regional disaster management plan, ethnographic data, disaster response activities, disaster preparedness.*

## 1 Introduction

Municipal disaster management plans are required to be annually reviewed and revised if necessary, according to the Disaster Countermeasures Basic Act of 1961, Articles 42, Japan [1]. A disaster management plan basically consists of 4 parts: general provisions, disaster prevention, disaster response and recovery, and reconstruction. Administrative operational outlines regarding municipal



disaster prevention and countermeasures are stipulated in the plan. It is apparent that operational knowledge is required in order to revise plans appropriately. However, disasters do not occur often, and municipal officials normally do not experience response activities. Accordingly, they are often unable to recognize the tasks they must perform until a disaster occurs. It is also anticipated that the plans will be only partially revised, preventing smooth and effective response in future disasters. This problem may cause deficiency in response.

## 2 Objectives of this study

The present study, as a case study of a municipal government in Tokyo, examined disaster response activities written in a regional disaster management plan. The purpose was to propose a method to enhance disaster response capabilities of municipal officials and to improve the plan, using ethnographic data of municipal responders of past disasters.

## 3 Review of the literature

In order to examine post-disaster human behaviour after the Great Hanshin-Awaji Earthquake (Shigekawa *et al.* [2]) adopted ethnographic analysis. Using interview data of disaster victims, their residential transition and time phases were identified. The study showed the significance which ethnographic data had for analysing and understanding the response process after the disaster.

Komatsubara *et al.* [3] recognized that ethnographic data contained implicit knowledge of responders. They applied ethnographic interviews of the Niigataken Chuetsu-oki Earthquake in 2007 to visualize procedures of issuing damage certificates. They indicated that consecutive ethnographic interviews helped create an operational manual.

Ethnographic data was utilized by Takemoto *et al.* [4] in an emergency training exercise. They proposed a program to improve competencies of responders, and an ethnographic learning process was practiced. Interview data was used as teaching material to help officials understand governmental responses. They verified that the program using ethnographic data was more effective to improve skills of officials, compared to lectures.

In the present study, the achievements of the previous studies were applied to upgrade a regional disaster management plan. Learned lessons from ethnographic data were utilized for improving the plan, in addition to enhancing response abilities.

## 4 Countermeasures after the great east Japan earthquake

The Great East Japan Earthquake occurred in Japan on March 11<sup>th</sup> 2011, causing extensive damage to the Tohoku Pacific coastal areas in the northern part of Japan. As the damage by the disaster was unexpectedly severe, government

officials have often been criticized for a damage estimation that is seen as optimistic.

The Fire and Disaster Management Agency notified prefectural governors of “Conducting an emergency inspection of disaster prevention schemes based on regional disaster management plans, etc. (acknowledgement)” in Sho-bo-sai No. 157 in May 2011 [5]. It announced that the Committee for Technical Investigation on Countermeasures for Earthquakes and Tsunamis Based on the Lessons Learned from the “2011 off the Pacific coast of Tohoku Earthquake” would be set up in the Central Disaster Prevention Council. According to the announcement, the basic plan for disaster prevention would be emended after publishing a report from the committee. This emendation leads to revisions of prefectural disaster management plans. Municipal plans are then required to be revised based on the prefectural emendation.

#### **4.1 Research subject city**

The subject city for study is located in the southeast edge of the Tama area of Tokyo. It is a commuter town, a half an hour train ride away from the central Tokyo metropolitan area. The population exceeded 78,000 according to the 2010 census [6].

It is located on the right bank of the Tama River, a first-grade river. Looking at its disaster history, the city experienced a flood in 1974 due to breached levees, and 19 houses were swept away [7]. Since then, it has not experienced a major disaster for approximately 40 years.

#### **4.2 Revising the regional disaster management plan**

Municipal governments are the closest administrative organizations to disaster victims, compared to prefectural and national governments. In a response period, municipal officials provide support to citizens. In order to operate appropriately, effective support requires operational knowledge. The same applies to revising a municipal disaster management plan.

The city held a disaster management council in October in 2012. Three topics were discussed there, damage estimation of metropolitan inland earthquakes, outline of revision of a disaster management plan of the Tokyo metropolitan government, and revision of the city plan. It also set up exploratory working conventions for revising the regional disaster management plan.

### **5 Research methods: exploratory working conventions**

The exploratory working conventions were to check and validate the disaster response part of the municipal disaster management plan. They were held twice, on October 19<sup>th</sup> and November 19<sup>th</sup>, 2012. There were six teams, corresponding to those of the emergency operations centre of the municipality (Table 1). Thirty-two members in total were assistant managers or had equivalent job titles, selected from each department for the conventions. They are in the position of becoming frontline leaders when a disaster strikes.



We proposed a method of formulating a consensual decision making process where members check and validate their response activities in the plan. The process was held in the conventions using workshops.

Table 1: Teams in exploratory working conventions.

Teams (Divisions)	Number of members	Operations in disaster response
Administration and general affairs	4	<i>Total management</i> , logistics assistance, receiving official from other municipalities, restoration of municipal facilities
Planning and finance	7	Publicity, budget of disaster countermeasures, designation as a disaster of extreme severity, <i>public donation</i>
Civil life	4	Burial and cremation, damage certificate, <i>food etc. supply</i> , loans to small-and-medium-sized enterprise and agricultural businesses
Welfare and health	5	Secondary evacuation centres, volunteers, reconstruction of life, disposal of dead bodies, medical aid, <i>measures for people requiring assistance</i>
Construction and environment	5	Obstacle clearance and restoration, search and rescue, safety check, emergency water supply, <i>waste treatment</i>
Education, children and juveniles	7	Emergency childcare, <i>evacuation centre operation</i> , emergency education

*Operations in italics: examined in the November 19<sup>th</sup> convention*

### 5.1 October 19<sup>th</sup> convention

The convention was for approximately three hours and a half with breaks. Four steps were taken in the process.

First, explanation was given regarding an outline of revising the municipal disaster management plan, exploratory working conventions and schedules. Second, a thirty-minute lecture on municipal disaster response was given by a specialist. Third, a brief explanation of working procedures was mentioned. Finally, team members read the plan and recognized their administrative affairs, and the activities were categorized into three with discussion: 1) general administration, employing standard skills but increased workload, 2) activities unique in a disaster, and 3) activities which are misallocated. Output from each team was presented and shared among the other teams at the end.

### 5.2 November 19<sup>th</sup> convention

The convention conducted over three hours with breaks was based on a workshop style. A lecture regarding previous ethnographic studies of disasters was given first. Participants recognized the importance of understanding an actual response from the data. After the lecture, they read scripts of interviews taken after the Mid Niigata Prefecture Earthquake and the Great Hanshin Awaji Earthquake. Due to the limitation of time, ethnographic scripts regarding a single responsible activity of each team were selected and provided (Table 1). The participating officials worked together in a team, discussed activities written in the scripts and necessary improvements to the plan.

This process can be regarded as operational simulation training. Acquired operational understanding helped members judge how their administrative duties

in the plan should be revised. They clarified important components in the ethnographic data and pointed out improvements.

## 6 Results and discussion

Response activities in the plan were categorized into three categories. Depending on divisions, the number of activities in each category differed (Fig. 1). It is apparent that many of the response activities appeared after a disaster. Especially in divisions of planning and finance, and construction and environment, the proportion of activities unique in disasters was larger than in other divisions. Government organizations have been targeted for cutbacks in manpower. The imbalance is apparent from the increase of workloads.

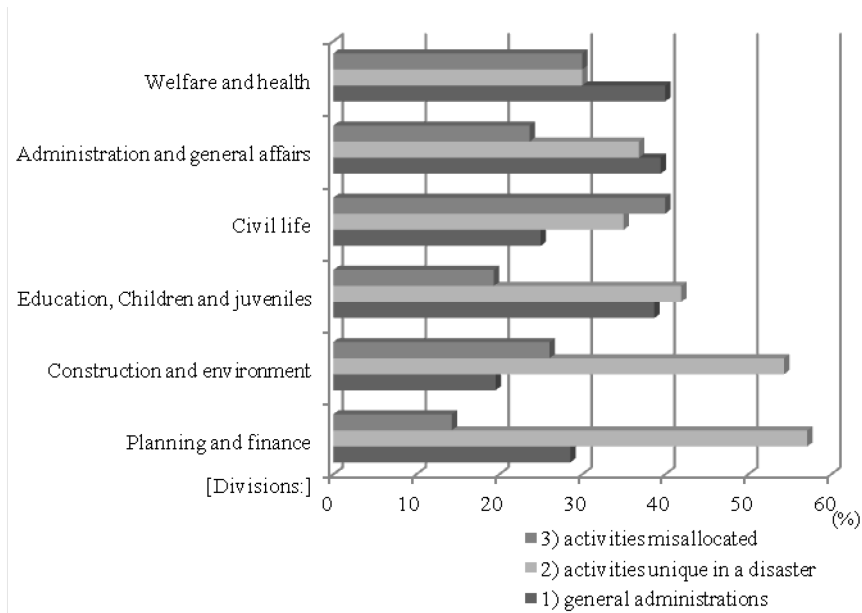


Figure 1: Comparing categorized response activities – number of cards (activities) officials listed.

Officials generally do not conduct activities categorized as 2) and 3). Therefore, both can be considered unique in disasters. The total was the highest in the construction and environment division. With a focus on this division, results of the 2<sup>nd</sup> convention were examined in the present study.

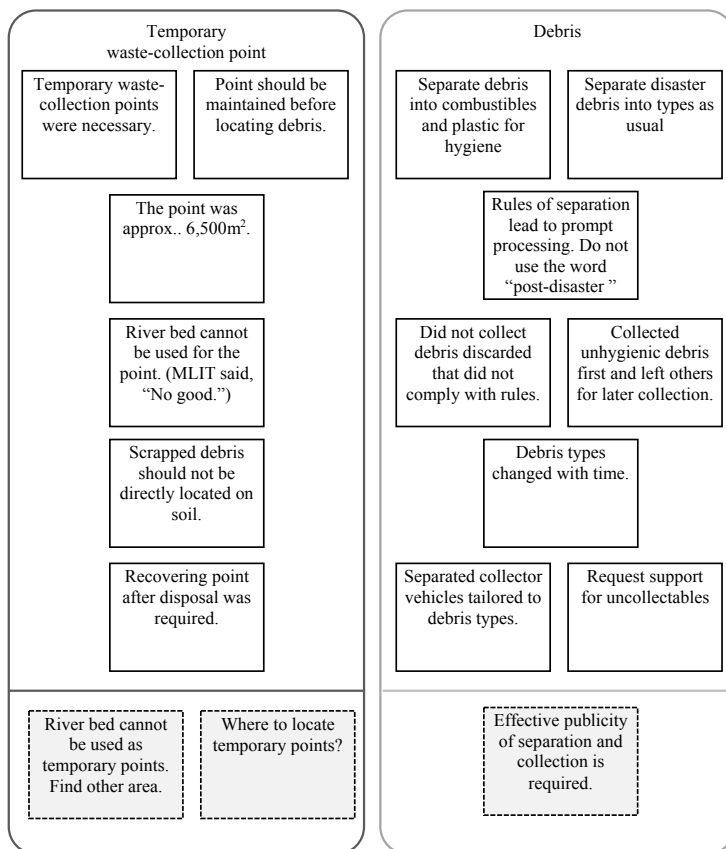
Considering the percentage of activities categorized as 2), it is obvious that manpower will be in short in a response. Officials in the construction and environment division realized their situation, and countermeasures were discussed by the team: requests for assistance from other divisions, employing retired personnel, and organizing volunteers, etc. Activities often require professional techniques in this division. Pre-disaster arrangement is critical.

Table 2: Response activities categorized into three (division of construction and environment).

Categorized as	Chapter	Activity
1) general administrations	emergency transport	maintain emergency transport network
		emergency obstacle clearance on road
		debris disposal agreement with Contractors Association
		obstacle clearance in river (small-scale and reached on river bank)
	debris disposal, ensure toilets, and excreta disposal	garbage collection and transport
		excreta transportation system
		maintain manhole toilets
	recover lifeline facilities	recover sewer culvert
2) activities unique in a disaster	emergency transport	shipping terminal
		select potential locations for emergency temporary landing field
		select emergency obstacle clearance routes
	debris disposal, ensure toilets, and excreta disposal	establish waste stations
		establish temporary waste-collection points
		ensure temporary waste collectors
		arrange cesspool cleaner vehicles
		ensure routes for waste and excreta transport
		ensure domestic water
		formulate a excreta collection plan of temporary toilets
		debris disposal and reuse
		consultation for debris clearance
		contract with debris disposal services
		ensure temporary scrap-yards
		debris disposal
		provide information on debris disposal bearing public expenses
		report debris generation amount to national and prefectural governments
		investigation into soils and stones, bamboo and wood
	recover lifeline facilities	emergency countermeasure in sewage facilities
	recover public facilities, etc.	response to inland water and river
		emergency safety check on public facilities, etc.
	ensure housing and reconstruction	indicate results of emergency safety check
		implement emergency safety check
		investigate into housing damages
		maintain emergency repair ledgers
		obstacle clearance in rivers
3) activities misallocated	emergency transport	ensure transport vehicles, etc.
		transport emergency supplies and manpower, etc.
	debris disposal, ensure toilets, and excreta disposal	stock temporary toilets
		ensure emergency temporary toilets
		ensure equipment and manpower for debris disposal
		separate debris
		disposal of soils and stones, bamboo and wood
	ensure housings and reconstruction	emergency repair of damaged housings
		supply temporary housing
		supply privately-rented housing
		launch temporary housing services

In category 3) activities misallocated, emergency transport of vehicles, supplies, and manpower were found (Table 2). Cooperation with private sectors should be planned. Temporary housing response was also found in this category. Officials considered other divisions should be in charge, while the activity had been conducted by construction related divisions in previous disasters. It is important to set up opportunities for municipal officials to recognize their responsibilities, considering the fact that more than 93% of the members never read the plan before the conventions.

In the division of construction and environment, scripts were provided on emergency debris disposal, including temporary toilets and excreta disposal. Regarding temporary waste-collection, the fact was perceived that river beds cannot be used as collection points (Fig. 2). It is critical to decide collecting



\*MLIT: Stands for Ministry of Land, Infrastructure, Transport and Tourism.

Figure 2: Debris disposal.

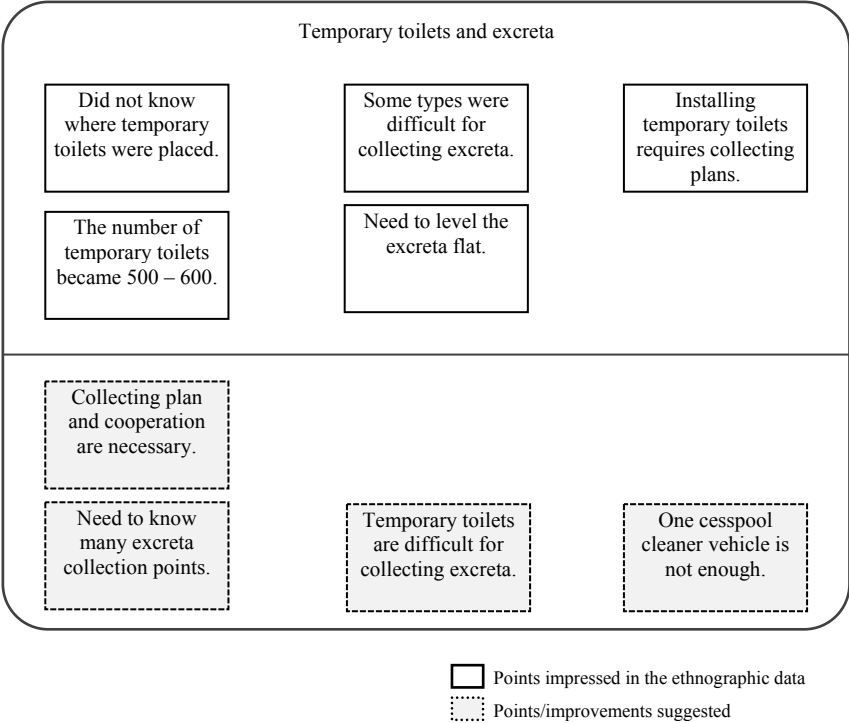


Figure 3: Excreta disposal.

locations in the plan. Candidate sites were discussed. Meanwhile, in debris separation, the importance of publicity was mentioned. Cross organizational discussion is required, which could not be implemented in the convention. Additionally, it was affirmed that normal separation rules for domestic waste should be maintained in disasters.

In the previous disaster, the locations where temporary toilets had been installed were not fully understood. This hindered smooth excreta collection. It was also recognized that the type of temporary toilet employed affected collection. Moreover, the municipality currently owns a single cesspool cleaner vehicle, and any collecting operation will be extremely difficult without taking additional measures. It is critical to prepare a practical and effective excreta disposal plan. Pre-disaster measures should establish plans, including locations and types of temporary toilets, collection points, and cooperation with related organizations in collection, etc.

Other improvements were suggested regarding assistance from unaffected municipalities, a personnel system, cross-organizational coordination, and stock. As for external assistance, aid teams are preferred to be self-contained in a disaster, as a host organization is generally severely damaged and incapable of accepting them. In the ethnographic scripts, an unaffected municipality sent a



team, and arranged with disposal facilities before deploying without receiving a request, avoiding placing an additional burden on the affected government. Needs were observed for finding disposal facilities which accommodate the regular separation rules of the city.

Six activities were examined and verified through the conventions. The present study particularized the outputs produced by the division of construction and environment. It is essential to reflect on the improvements indicated through the conventions into the regional disaster management plan. In order to achieve the actual and effective plan, coordination with related divisions should be performed.

## 7 Conclusion

The present study

- 1) proposed a method to examine disaster response activities written in a regional disaster management plan of a municipal government. Using ethnographic data of past disasters, present municipal officials pictured the image of a disaster response. Necessary improvements in the plan were discussed and identified.
- 2) shows that response activities in a regional disaster management plan were divided into three categories: 1) general administration, employing standard skills but increased workload, 2) activities unique in a disaster, and 3) activities which are misallocated. Municipal officials generally do not conduct activities categorized as 2) and 3).
- 3) indicates that the amount of response activities unique in disasters was prominent, especially in the divisions: construction and environment, and planning and finance. Taking account of recent job cutbacks in municipalities, the imbalance between workload and manpower is apparent.
- 4) demonstrates that this method helps municipal officials recognize the current situation where organizational structure hinders prompt response. It is crucial to establish opportunities to understand their administrative tasks in disasters and to prepare cross-organizational cooperation and coordination.

Improvements suggested in the present study are important. However, further coordination among divisions and organizations are needed in some cases. Concerning activities categorized as misallocated, conducting inquiries to divisions will be advisable in addition to the proposed method.

This study was also limited in that a convention team worked on a single operational activity. Future studies will target other activities, and will implement operational manuals regarding the activities unique in disasters pointed out in the present study.

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