



STUDY ON MUTUAL AID OF LOCAL GOVERNMENTS AFTER THE 1995 HYOGOKEN-NANBU EARTHQUAKE DISASTER

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SUMMARY

In Japan, the emergency response of damaged local governments is based on self-reliant activities, while few coordinated activities are seen from other local governments or agencies. However, the self-reliant activities could not work effectively under the catastrophic situation of the 1995 Hyogoken-Nanbu earthquake. The earthquake has made it clear the importance of coordination among local governments. The object of this study is to clear the fact how mutual aids of local governments towards disaster areas were done. We collected data by questionnaire surveys against 47 prefecture offices, 212 local governments in Hokkaido, and other 3,168 local governments. In this paper we will report survey data obtained from 3,238 local governments which have commenced their urgent activities, for helping damaged areas in Hyogo prefecture, just after from Hyogoken-Nanbu earthquake

INTRODUCTION

In Japan, the emergency response of damaged local governments is based on self-reliant activities, while few coordinated activities are seen from other local governments or agencies. However, the self-reliant activities could not work effectively under the catastrophic situation of the 1995 Hyogoken-Nanbu earthquake. The earthquake has made it clear the importance of coordination among local governments. Some logistic sites must be necessary for sending personnel and relief goods to damaged area. In view of clarifying the mutual aids among the local governments, we collected data on aids by sending questionnaire sheets to 3,238 municipalities in Japan except for 10 cities and towns in Hyogo prefecture to which the Disaster Relief Law was adopted.

We collected data by questionnaire surveys against 47 prefecture offices, 212 municipalities in Hokkaido, and other 3,026 municipalities. This paper reports survey data obtained from 3,238 local governments which have commenced their urgent activities, for helping damaged areas in Hyogo prefecture, just after from Hyogoken-Nanbu earthquake. Number of recovered sheets was 1,491 and percent recovery was 46.05% (Table 1).

Supports by local governments were divided into four types, aids of human resources, material aids, offer of facilities and financial aids (Table 2). Generally speaking dispatching staff member and sending relief goods are important at restoration phase, financial aids are at reconstruction and using public institution are at every phase. Each aids have difference on its necessities, depends on timing and continuation.

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Table 1: Recovery sheets used for analysis.

		City	Town	Village	Total
Municipalities in Hokkaido	Number of delivered sheet	32	156	24	212
	Number of recovered sheet	31	152	23	206
	Percent recovery	96.88	97.44	95.38	97.17
Prefecture offices	Number of delivered sheet				46
	Number of recovered sheet				21
	Percent recovery				45.66
Other municipalities	Number of delivered sheet	645	1,828	553	3,026
	Number of recovered sheet	318	1,048	223	1,285
	Percent recovery	49.30	57.33	40.33	42.47

Table 2: Types of aids and its necessity with time.

	Restoration			Reconstruction
	short term	middle term	long term	
Dispatching staff member	search and rescue medical service investigation	lifeline recovery	consulting service general office work	
Sending relief goods	foods, water medicine blankets, clothes tools	water truck garbage truck		
Using public institution	hospital crematory	houses, school institutions for the aged		open space
Sending money				foundation for reconstruction

OUTCOME AND DISCUSSION

Time Frame and Regional Characteristics of the Aids:

Figure 1 shows the variation in numbers of municipalities in Hokkaido where is the north island, which decided to execute three types of aids, dispatching staff member, sending relief goods and sending money. In the first two weeks, the types were mostly financial and material aids. Two weeks after the earthquake, the type of aids moved to human resources, e.g., quick damage survey of buildings, administrative works, and operation of shelters. It was seen that financial aids and goods were conducted promptly but it took some time till the human resources aids were deployed.

Figure 2 shows municipal countermeasure depending on area. The emergency aids to the Hanshin-Awaji area by local governments shows non-uniform distribution in Japan. Participation rates to the aids are high for the Kinki area in all the aspects. No clear regional distribution is found for monetary aids. Participation to human resources aids is high for Kanto, Chubu and Hokuriku regions. Regional difference to the aids may exhibit some regularity depending on types of aids. To clarify this regularity may be useful for future crisis management in Japan.

Aids of Human Resources:

The participation rate to human resources aids by municipalities was higher for cities than for towns and villages (Fig. 3). Cities dispatched personnel for lifeline restorations and administrative works. The distance from the affected area do not affect the participation rate to the aids for cities while significantly reduced the rate is as the distance becomes longer is observed for towns and villages, especially for small towns and villages (Fig. 4).

The type of emergency aids also shows distance-dependence. Higher participation rate for emergency administrative works is seen for municipalities close to Kobe (Fig. 5). Municipalities far from Kobe tend to participate in less urgent works. The critical distance to divide the form of aids is found to be about 400-500 km..

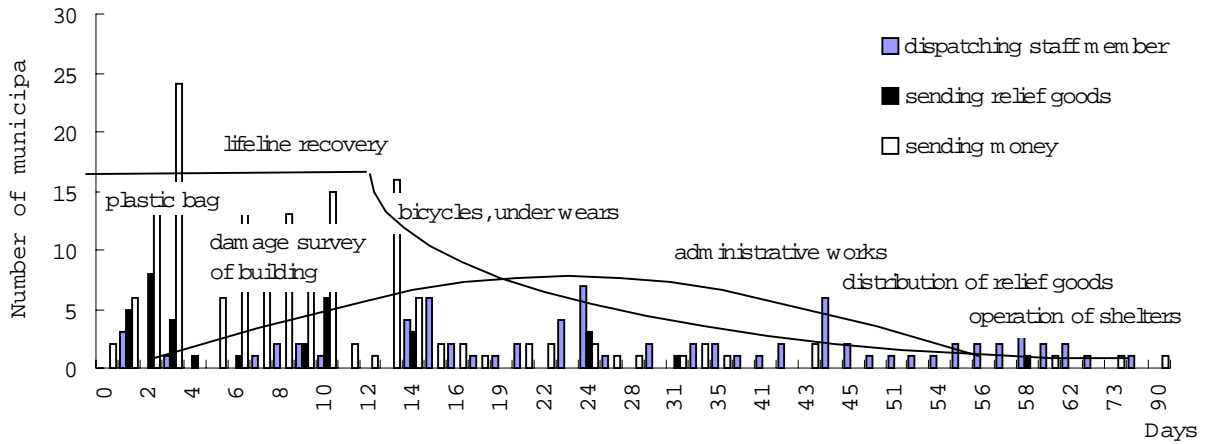


Fig. 1 Numbers of municipalities which decided to execute three types of aids in Hokkaido

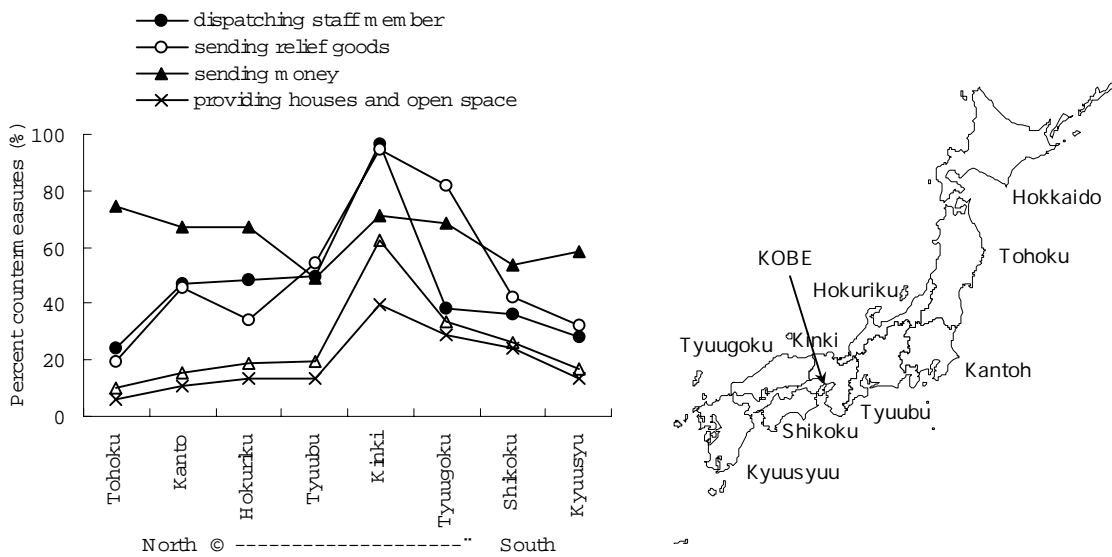


Fig. 2 Municipal countermeasure depending on area

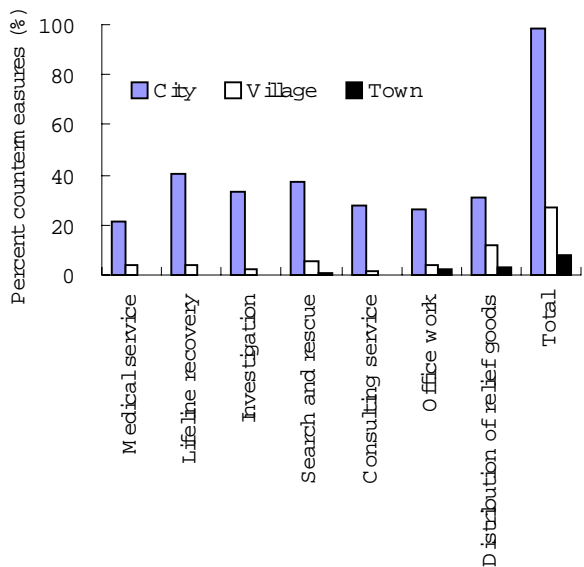


Fig. 3 Countermeasures depending on municipal scale

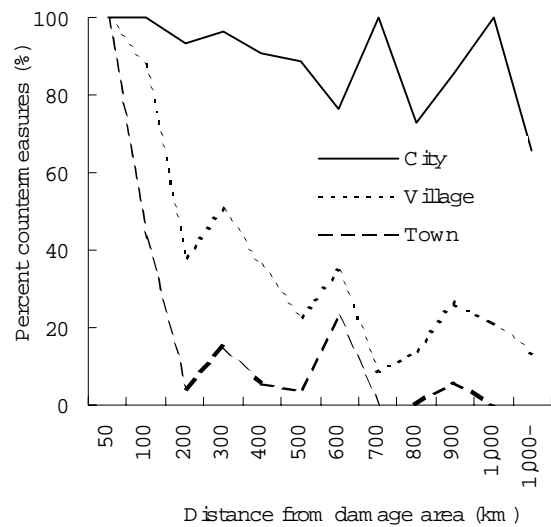


Fig. 4 Percent countermeasures depending on municipal scale and distance

Figure 6 shows start time of human resources aids by cities. The start time has its peak on the next day of the earthquake while towns and villages start their aids much later, mostly 3 to 5 weeks after the event. From these observations, the roles of municipalities to human resources aids may be proposed as follows; 1) urgent and professional aids should be provided by cities and nearby towns and 2) time and labor consuming works should be done by towns and villages close to the affected area

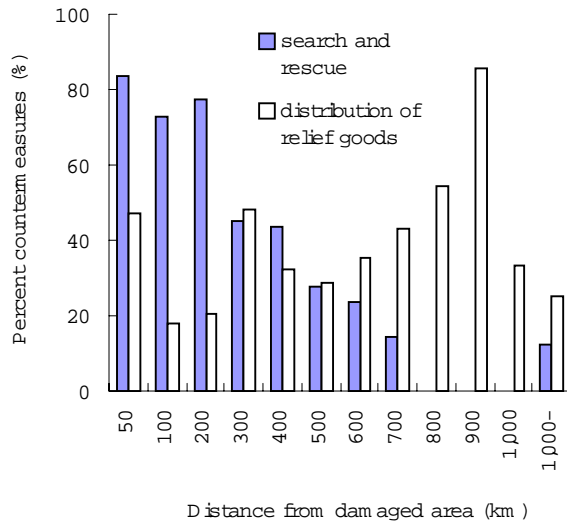


Fig. 5 Emergency works depending on distance

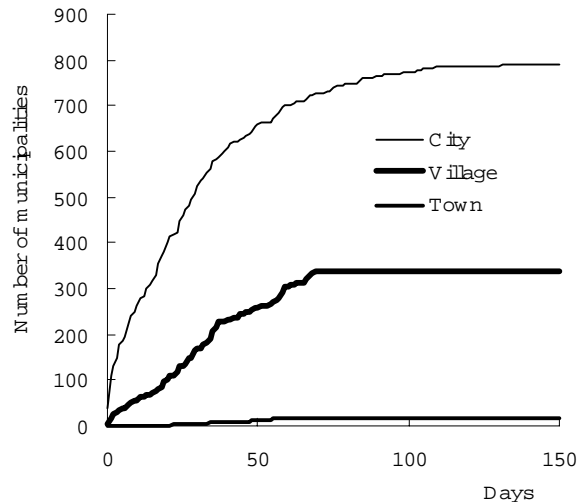


Fig. 6 Starting time of aids depending on municipal scale

Material aids:

In figure 7, the participation rate of material aids is increased in proportion to the size of municipalities. Especially, many cities sent goods for emergency water supply, water tank trucks, garbage collection trucks, and medical supplies, etc. No clear difference can be seen in the form of material aids between towns and villages. Foods and daily goods, which can be purchased rather easily after the disaster, shows higher participation rate. Small municipalities tend to send these materials. Figure 8 shows how municipalities provided relief goods for damaged area. On the contrary, equipment for emergency operations may be difficult to obtain without having stocks. Hence, roles of municipalities in material aids depend on the scale and disaster-preparedness of municipalities.

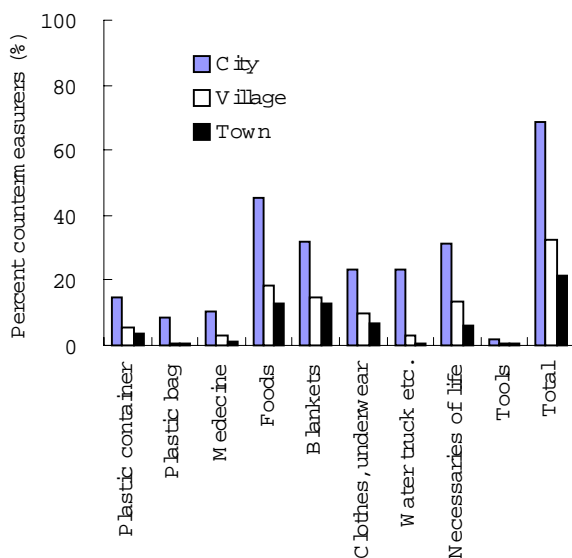


Fig. 7 Countermeasure depending on municipal scale

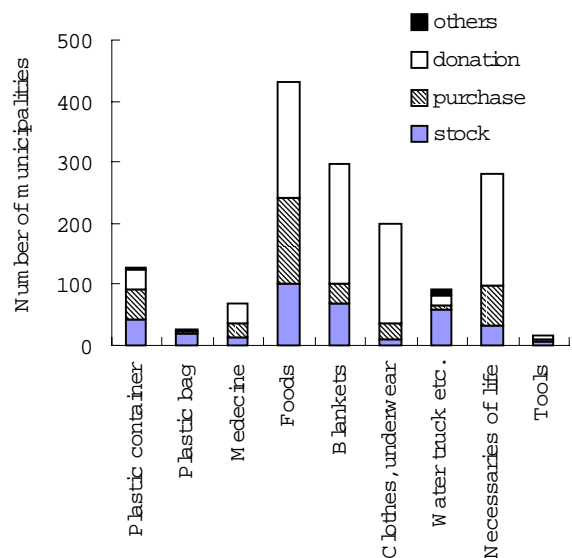


Fig. 8 Way of getting relief goods

Figure 9 shows the start and the end of material aids,. The material aids by municipalities were concentrated in the first few days after the event, which was highly responsible for the heavy traffic jams in the affected area. These relief goods also created an additional work: they must be classified and repacked depending on items before distribution. The office reports of damaged area describe many circumstances: they worry about how to manage and distribute relief goods that were sent [1, 2, 3].

We compared the data beginning of material aid with distribution of relief goods to examine how timing of aids were appropriate or not (Fig. 10). It was found from questionnaire survey that, although these aids materials were sent mostly in the first week, they were distributed to refugees much later because handling of these goods was very time- and labor-consuming. Hence, it is not a smart selection to send a large amount of goods in an early stage. In hearing survey to city officers of Kobe and Nishinomiya, they told that the aid goods sent from producers were very helpful since no need to classify and to repack. On the other hand, small mail packages from individuals were not much use. In the same manner, the items and amount of relief goods by municipalities should be selected properly and should be sent at a proper time. It is also pointed out from the survey that the maximum distance for water and cooked-food aids was about 100 km, 2 to 3 hours of transportation.

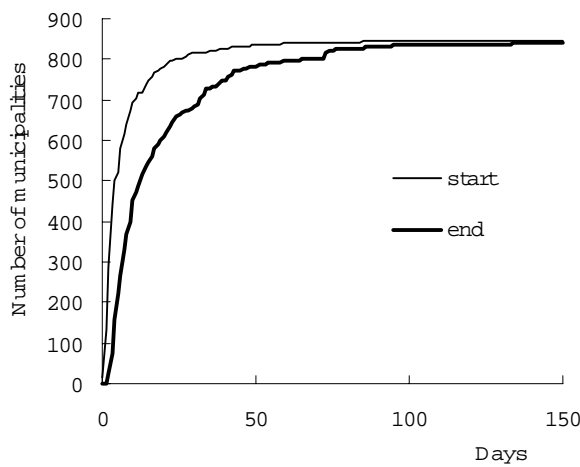


Fig. 9 Beginning and end of material aids

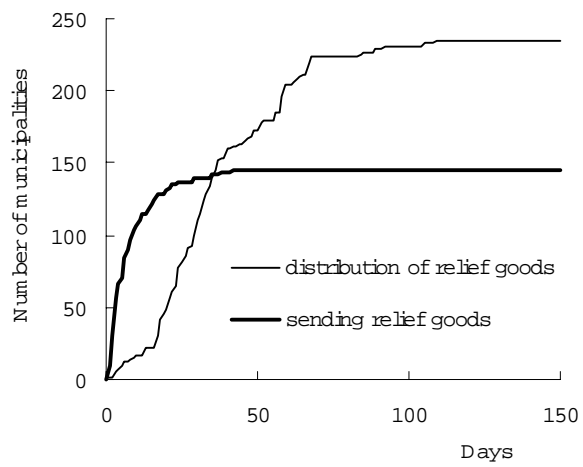


Fig. 10 Beginning of material aid and distribution of relief goods

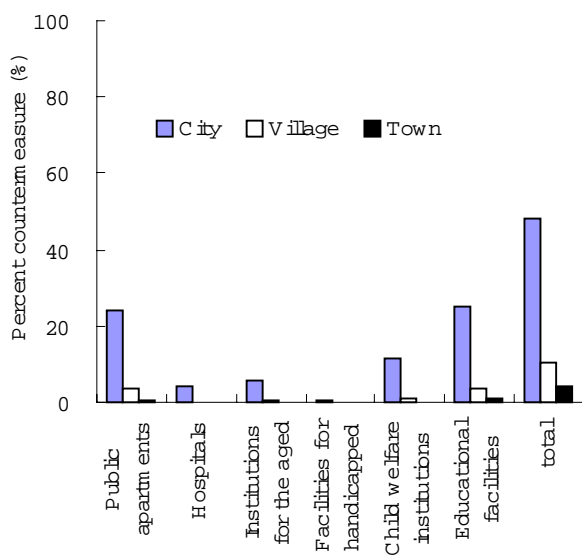


Fig. 11 Countermeasure depending on municipal scale

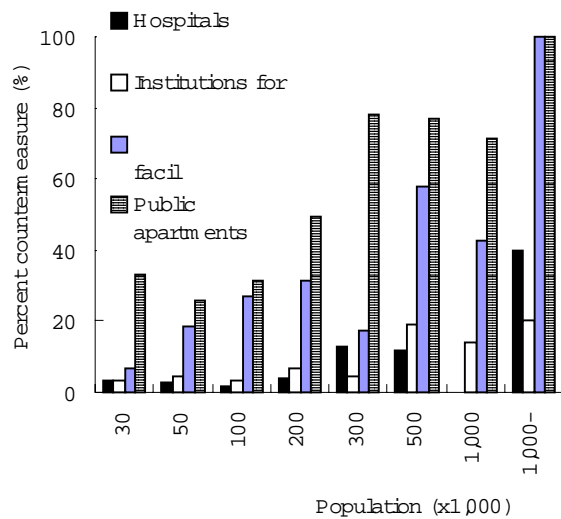


Fig. 12 Countermeasure depending on municipal scale

Offer of Facilities:

Some cities offered public apartments and health care facilities, but the in numbers were limited because only large-scale local governments can offer residents and health care facilities (Fig. 11). Towns and villages made very few offer of hospitals, institutions for the aged, child welfare institutions and facilities for handicapped persons. These results suggest social problems: possibilities and effectiveness of the offer should be decided before the shaking. Actually, apartments and hospitals were offered by municipalities and prefectures with population of more than 300,000 and health care and educational facilities with population of more than 500,000 (Fig. 12).

General trend of refugees should also be considered for this kind of aids. Even free residents are offered by prefectures or municipalities in long distance, only few applicants exist since refugees want to stay closer places. Figure 13 shows numbers of offered public apartments and occupancy rate depending upon areas. For example, no applicants were there for the residents aid by Aomori Prefecture where is the north end of the Mainland [4].

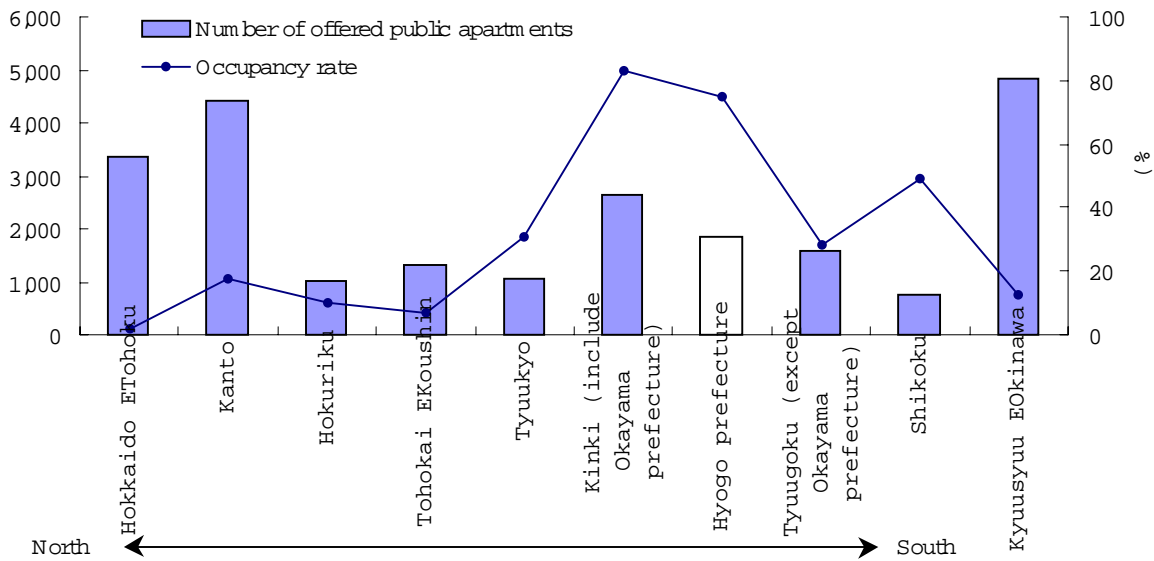


Fig. 13 Number of offered public apartments and their occupancy rate depending on areas

Financial aids:

Many municipalities, 67.63 % for cities, 54.78 % for towns, and 51.67 % for villages, offered financial aids from public budgets to the affected municipalities (Fig. 14). It is seen that the participation rate to the monetary aid was high even for towns and villages. The amount of money was mostly proportional to the scale of municipalities.

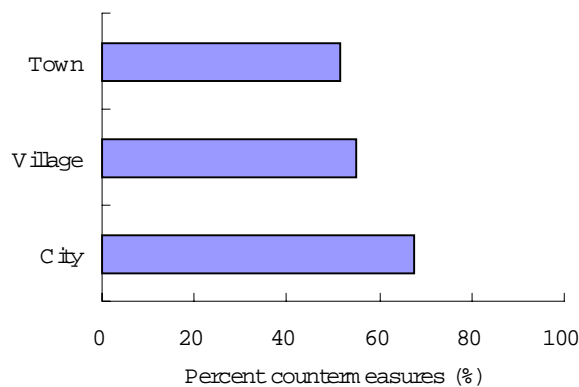


Fig. 14 Financial support depending on municipal scale

RESULTS

Supports by local governments were divided into four types, aids of human resources, material aids, offer of facilities and financial aids. We found that supports were systematically controlled by many factors as follows: supports had time frame and regional characteristics.

The type and levels of these support activities were related to the population size of supporting municipalities and the distance from damaged area. The participation rate to human resources aids was higher for cities than for towns and villages. The distance from the affected area do not affect the participation rate for the aids of cities while significantly reduced the rate is as the distance becomes longer for towns and villages, especially for small towns and villages. The types of emergency aids also shows distance-dependence. Higher participation rate for emergency administrative works is seen for municipalities close to Kobe. Municipalities far from Kobe tend to participate in less urgent works. Start time of human resources aids by cities has its peak on the next day of the earthquake while towns and villages start their aids much later, mostly 3 to 5 weeks after the event.

Proportional to the size of municipalities, the participation rate of material aids is increased. Especially, many cities sent goods for emergency water supply, water tank trucks, garbage collection trucks, and medical supplies, etc. No clear difference can be seen in the form of material aids between towns and villages. Small municipalities tend to send foods and daily goods, which can be purchased rather easily after the occurrence of a disaster. On the contrary, equipment for emergency operations may be difficult to obtain without having stocks. Hence, roles of municipalities in material aids depend on the scale and disaster-preparedness of municipalities.

Some cities offered public apartments and health care facilities, but the number of such offers was limited because only large scale local governments can offer residents and health care facilities. Many municipalities offered financial aids from public budgets to the affected municipalities. The amount of money was mostly proportional to the scale of municipalities.

CONCLUSIONS

This paper presents the result of the questionnaire survey on public aids by local governments after the Hyogoken-Nanbu earthquake disaster. The present study aimed to show the quantitative and qualitative aspects of the aids in earthquake disaster and examine factors to determine the forms and levels of the aids. The questionnaire sheets were sent to all the 3,238 municipalities in Japan and 46.05 % of them were replied. The results suggested the future directions of mutual aids between local governments after earthquake disasters. Aids of human resources seem almost appropriate in the current level and form. Timing and items of material aids need to be reconsidered. Offer of residents and facilities is limited under the present social circumstances, and which are not easy to improve the current level.

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