

Small Earthquake and Immediate Responses by Municipal and Regional Governments -A Case Study in Aichi Prefecture, Japan-

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1. Introduction

On Oct. 31, 2000, the Mie-ken Chubu earthquake with $M=5.5$ attacked the central part of Japan and all the region in Aichi Prefecture was felt having the maximum seismic intensity of 5(-) in a city on the JMA scale. It was fortune that there was almost no damage in all the felt area, but the area might suffer serious damage if the seismic shaking would be much stronger. To know what kinds of countermeasures are ready in plan phase and were executed actually in municipal and prefectural governments for such a moderate earthquake give an opportunity to explore the better way for reducing disasters due to larger earthquakes. In this point of view we conducted a survey to disclose existing countermeasures against earthquakes, using a questionnaire and other methods to all the 88 municipalities in Aichi prefecture.

2. Survey

Major questions given to the municipalities were two in the scope of immediate responses; one was to make clear the preparedness details in action plan phase or manual level and the other was to examine the real activities executed at the occurrence of the Mie-ken Chubu earthquake. In parallel with the questionnaire survey for municipal governments, an additional survey in use of written documents was made for the prefectural government. Focused in the survey are 3 principal items for better initiation of immediate responses, since successive activities were not requested nor observed at the earthquake under question because of no damage. Those are the setup of headquarters, the mobilization of personnel and the damage survey.

3. Analysis and some of Results

(1) Plan phase Based on the answers from all the municipalities a statistical analysis was made to characterize the relation of execution rates to seismic intensity. The average seismic intensities at which 50 % of municipalities get into real operation were disclosed as 4.02 for the setup of headquarters, 3.23 for the mobilization of personnel and 3.24 for the damage survey, respectively. These average values were obtained by the Logistic curve approximation.

(2) Execution phase: case study at the Mie-ken Chubu earthquake

The occurrence of the earthquake was recognized by the seismic intensity meters which had been installed at the municipal governments; the detection of the earthquake and sequential determination of seismic intensity was made by 86 out of 88 municipalities. Questionnaire survey tells us that the municipalities suffered seismic intensity equal or lower than 3 initiate immediate responses by a rate less than 50 %, but at seismic intensity 4 almost all the municipalities started certain activities to know, by a limited number of personnel, if any damage occurs or not in the concerned area. The municipalities that activated the headquarters are 3 out of 8 in seismic intensity 4. At a city where seismic shaking of intensity 5(-) was measured, the headquarters were automatically setup based on the input information from the installed seismic intensity meter system. What governmental officers executed, soon after the setup of the headquarters, were to investigate if damage to dwellings etc. occurs and residents suffer any casualties. Such investigation was made first via telephones and then by patrols.

3. Conclusions

At the occurrence of a moderate earthquake in the central part of Japan a questionnaire and other surveys were made, for all the municipalities in Aichi Prefecture, to elucidate the earthquake preparedness both from plan and execution basis in the local governmental unit of municipality. What found are 1) the existing preparedness plan in local governments has been well described in terms of [seismic intensity], and 2) an occurrence of non-damaging earthquake with moderate size may give a good opportunity to examine whether the preparedness plan works well or not against larger earthquakes in the future.