PERSONNEL’S RESPONSE-ACTIVITY SUPPORT MAP AGAINST EARTHQUAKE DISASTER

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SUMMARY

The purpose of this research is to make personnel’s response–activity map such as “Evacuation”, “Logistics” and “Fire Spreading Area” against earthquake disaster, using geographic technologies (GIS, Remote Sensing, CAD, etc.). Also, the spatial database system to produce the maps after the earthquake disasters is proposed. We made some proto-type response activity maps and database system for municipal government of Yokohama, Japan, based on the lessons learned at World Trade Center Building Attack Disaster on September 11, 2001. The effectiveness and problem of the maps and system we proposed are clarified by the questionnaire and interviews though personnel in municipal government.

INTRODUCTION

Since Kobe Great Earthquake Disaster in 1995, many GIS-based systems are developed in municipal governments in Japan to response the earthquake disaster. However, we don’t have enough experience to utilize these systems for practical response activity after the earthquake disaster. We wonder if quick and proper disaster response activities would be executed using these systems, in the great earthquake disaster such as Tokai and Nankai coming in near future.

On the other side, World Trade Center Building Attack Disaster on September 11, 2001, quick and proper emergency response activities were executed. It is reported that one of the important keys of the response was the utilization of spatial data and geographic technologies. By studying the case of WTC Building Attack Disaster, we found “simple” use of geographic technologies such as “overlay” and “visualization” is the most important key to support effective response activities after the great disasters.

One more point, in Japan, we don’t have as many geographic technology’s specialists as US has. Therefore we cannot expect the same situation as WTC building attack disaster regard to the use of geographic technologies. We have to propose the way of the utilization of geographic technologies suitable for Japanese society. Concretely, the maxim preparedness related to the maps is required in Japan because of the short of the specialists. The proposals of the maps to support the response-activity in municipal government are limited in number, though many maps to support the citizen’s disaster response-activity are proposed in all over Japan.

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TRIAL RESPONSE-ACTIVITY SUPPORT MAP

Through the lessons learned from WTC building attack disaster, we made 8 trial maps to support the personnel in the municipal government of Yokohama, Japan, based on the “Regional Disaster Prevention Plan”. We made maps for each task. For example, Figure 1 is the trial map in order to support “Logistics” by “Transportation Team” and “Relief Supplies Team”. In this map, scenario is that 1. Unloading relief supplies from ship to anti-earthquake berth, 2. Carry the supplies to Supplies Accumulate Center such as school and conference hall, though “Emergency Road” and “Wide Road” considering high-density area for old-wooden houses. Required Geographic data were overlaid and displayed with understandable colors to support the personnel’s decision making. The other maps we made are “Fire Fighting Map”, “Volunteer Support Map”, “Evacuation Map”, “Medical Map”, etc.

Finally we combined these maps with the personnel’s task. Figure 2 shows the relationship of the personnel’s task and the maps we proposed ordered with the time scale. Then, we had a questionnaire to the personnel in municipal government of Yokohama. The comments are, 1. Every map needs unified basic points data such as city hall, fire-fighting center, and evacuation place. Then, required minimum data for each activity should be added in the map, 2. 2 kinds of map scale such as citywide and district levels are effective to see, because personnel should consider the event in macro and micro view at the same time. 3. Unified colors should be decided for all of the maps.

CONCLUSION AND FUTURE WORK

In this study, 8 trial maps are proposed to support personnel’ response–activity against earthquake disaster in municipal government. We will improve these maps to support the personnel’s response activities effectively thought the questionnaire and interview with the municipal government of Yokohama.

Figure 1. Logistics Map in MM21 district, Yokohama

Figure 2. Personnel’s task with time order and the maps

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