

## Development of the method system for local disaster damage anticipation by citizen participation using risk information

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Local communities must autonomously handle large-scale disaster, such as earthquake and flood. Management of disaster risk by social network of local communities and collaboration named as "disaster risk governance" is important to improve local coping capacity against disasters (Nagasaka and Ikeda, 2008). To improve this capacity, the local community must reasonably evaluate disaster risk by risk communication and disaster risk information.

The disaster damage anticipation is useful way to reveal local disaster risks. However, traditional disaster damage anticipation have three problems, 1) no method for local disaster damage anticipation; 2) no risk communication; 3) various disaster risk information are not utilized. The aim of this study is to develop the method and system for local disaster damage anticipation by citizen participation using disaster risk information.

In developed method, the damage anticipation consists of 10 categories, 1) house damage; 2) human damage; 3) neighborhood damage; 4) lifeline damage; 5) the number of evacuee; 6) damage of transit; 7) damage of stores; 8) existence of helping vulnerable people; 9) damage of community care; 10) the number of people who cannot go home.

The quantity of each damage category is decided by communication between local communities and the expert. Various disaster risk information such as social statistics, hazard maps and damage anticipation by local government are used. They integrate local communities and expert knowledge. Considering the uncertainty of the knowledge, range of disaster damage anticipation is understood.

The developed damage anticipation method was tested. Local communities could understand disaster risk in their local communities. After this damage anticipation, local communities discussed handling and management of evacuation shelter in workshop.

To make all of the local communities anticipate their disaster damage, web-based disaster damage anticipation system is developed. A local community anticipates disaster risk on wizards step by step. Based on interoperable geographic information system (GIS), such as web feature service (WFS) and web coverage service (WCS), the system can integrate multi-source disaster risk information.

**Keywords:** disaster risk information, disaster damage anticipation, citizen participation, local disaster prevention, geographic information system, risk communication