

Consideration of essential information and understandable representation method for liquefaction hazard map: Opinions from local government staffs and residents

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Ministry of Land, Infrastructure and Tourism has been conducting the General Technology Development Project "Study on liquefaction hazard map creation method for risk communication" in order to promote pre-disaster prevention of liquefaction and reduce its damage. In this project, we consider the essential information and understandable representation method for liquefaction hazard map. Based on the contents of consideration, several prototypes of liquefaction hazard maps were produced, and we have collected opinions from local government staffs and residents through workshops and questionnaire sheets.

The size of prototype hazard maps is A1 size. They have "map part" and "learning and information part" to use them as basic data for risk communication. In the map part, the map is at the scale of 1:25,000 and based on topographic map of the Geospatial Information Authority of Japan. It includes the following information: possibility of liquefaction, risk of damage to houses by liquefaction, emergency transportation road, evacuation sites and railroads. We prepared maps with five color schemes in order to evaluate the relationship between visibility and color scheme. The learning and information part includes information such as what is liquefaction phenomenon, and the damage caused by it, and control methods of liquefaction to reduce the damage; which is considered necessary to increase awareness and understanding for liquefaction in conjunction with the map part.

We conducted workshops in Kumamoto city and Urayasu city to collect opinions from local government staffs. 8 people (including one university student) participated in Kumamoto city and 18 people in Urayasu city. 11 people in Kumamoto and 20 people in Urayasu (including audiences) answered the questionnaire. We also distributed questionnaires to 400 households and received 76 (19%) answers in Chikami and Kaminogo, Kumamoto city. In addition, we collected opinions from 4 residents of Akitsu-machi Akita by hearing.

Here, we show the opinions of local government staffs. They listed the following list as essential information of the map part: liquefaction risk, evacuation site, main road, main building, contact information in case of disaster and evacuation route. They also pointed out that it was easy to understand when warm color scheme was used to show the possibility of liquefaction and cold color scheme for water area. On the other hand, they pointed out the difficulty of understanding the explanation about the possibility of liquefaction and the risk of damage to houses by liquefaction. It can be said that both plain expression and visual clarity is necessary. For the learning and information part, they listed liquefaction mechanism, examples of liquefaction damage in the past, impact of liquefaction on daily lives, how to read hazard maps, etc. The result suggests that it is difficult for residents to understand the information on the map part due to lack of knowledge and awareness of liquefaction. This means that they require not only information that allow to imagine liquefaction and the damage caused by it, but also ingenious plans for residents to understand the role and way of utilization of liquefaction hazard map itself.

For future work, we will collect opinions from local government staffs who have never experienced liquefaction damage. Thus, we will make a manual for liquefaction hazard map creation based on these

opinions.

Keywords: Liquefaction hazard map, Workshop, Questionnaire