

A Study on Spatial and Temporal Resolution of Evacuation Information for Effective Evacuation Behavior

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1. Introduction

In recent years, heavy rains and typhoons that have never been experienced in the past have attacked Japan, such as Northern Kyushu District Heavy Rain in 2017 and Heavy rain in July, 2018, due to the effects of climate change, leaving large damages in various places. In natural phenomena never experienced in the past, actions that protect lives, in other words, appropriate evacuation are required. Evacuation information that triggers evacuation is important, but in some cases, because it will create residents who don't take initiative for their evacuation, various discussions have been made on when and how to use and how to utilize evacuation information. In the case of the Izu Oshima Sediment disaster that occurred due to heavy rain accompanying Typhoon Wipha in 2013, the evacuation recommendation was not issued, and in Hiroshima landslide disaster caused by the Heavy Rain in August, 2014, the delay of the evacuation information was pointed out. Following these issues, the "Guidelines on evacuation advisory" was revised in the year of 2017. However, there remains room for discussion as to whether these information are linked to evacuation behaviors. In this paper, we discuss these issues.

2. Evacuation Information and Expected Behavior

In the "Guidelines on evacuation advisory", it is recommended to prepare criteria according to local circumstances about evacuation preparation, evacuation recommendation, and evacuation order from the view points of receivers. Evacuation actions were defined as follows;

- (1) evacuation to the "urgent evacuation places" which are designated by administration,
- (2) evacuation to the "safe place nearby", and
- (3) movement to more secure room inside the building.

3. Temporal Resolution of Evacuation Information

In floods caused by heavy rain and sediment-related disasters, evacuation information will be announced in conjunction with time prediction of rainfall. In recent years, the occurrence of disasters is often expected to be late at night, but even if disaster information is announced at midnight, in many cases it cannot lead to evacuation behavior. Considering this, evacuation is proceeding from the time zone where evacuation behavior can be taken, but evacuation information in the absence of sense of crisis often leads to evacuation behavior.

4. Spatial Resolution of Evacuation Information

Evacuation information is generally presented to certain areas rather than to individual units. This spatial resolution does not have unified standards, but it varies from local governments. When the area is large,

there are many places where high risk and low risk are mixed within the area, and many residents judge that it is not necessary to take evacuation action. However, it is difficult for the municipalities that do not allocate adequate personnel to respond to disasters, it is difficult to narrow down the areas further and it is difficult to judge whether evacuation should be made for each door.

5. Conclusion

Residents cannot be judged of evacuation behavior by evacuation information unless they know its time resolution and spatial resolution. In order to properly receive these information and to take appropriate action, it is necessary for residents to raise their awareness. In order to realize this, it is required not only to prepare administrative policies but also to arrange arrangements in the region and home.

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