

# INVESTIGATION OF RESIDENTS' RESPONSE TO PROVIDED EVACUATION INFORMATION AT THE HEAVY RAINFALL AND FLOOD DISASTER

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## 1. Background and Purpose of the Study

As the occurrence of flood event has become common in many parts of the world, flood events during previous years have raised public, political and scientific awareness of flood risk and flood prevention (Becker, 2003). Recently, localized torrential heavy rain (e.g. guerrilla gou in Japanese) occurred in many places of Japan. This guerrilla heavy rain often leads to a severe flood, like Asanogawa River flood on July 2008.

Localized torrential rains fell over the area around Asanogawa River in Kanazawa city, Ishikawa Prefecture, Japan. These torrential rains were remarkable for the total rainfall and the amount of rainfall within short period of time that brought inundations, flooding homes, causing landslides and leaving serious damage.

This study is attempting to analyze the survey data of Asanogawa River flood and finds results of effectiveness of providing evacuation information taken by Kanazawa city government and other concerned authorities. This study mainly aims to investigate efficiency of provided evacuation information at the time of heavy rainfall on the emergency management, mitigation and human evacuation. Data of the information, damage and reaction of the people at different areas of Kanazawa city, Ishikawa prefecture are obtained through questionnaire survey, field investigation and internet.

## 2. Rate of taking evacuation in response to evacuation preparation information

In this part, the questionnaire is designed to grasp the evacuation situation of the residents according their acknowledgement of evacuation preparation information. The city administration made announcement and call the affected people for taking evacuation.

Here it is analyzed how about the effect of administration announcement to the victims for taking their evacuation in the designated shelter places of the city. It is explained by figure 1. It can be remarked by the analysis of figure 1:

(a) The percentage of the people those take had evacuation is very low.

(b) A large number of people did not take evacuation though they were informed about the evacuation preparation.

(c) Among the people of known and unknown of evacuation preparation information, the percentage of taking evacuation is very low. So it can be said that the evacuation information announcement could not able to motivate the residents for taking evacuation properly.

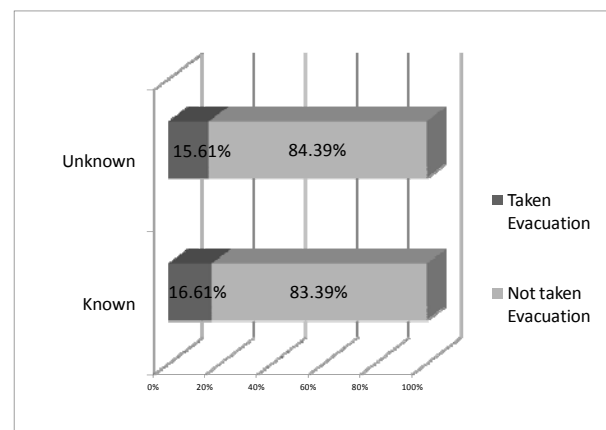


Figure 1: Rate of taking evacuation versus evacuation preparation Information n=1,357

### 3. Awareness and responsiveness to flood risk

The 2008 flood was the first time in 55 years that the around of Asanogawa River area has been damaged by massive flooding due to the failure of levees. Before the flood disaster, the local inhabitants felt secure in believing that the Asanogawa River would not flood. Now after the flood damage, based on the survey response it is shown that their concern is rising up.

Here in figure 2, it was investigated of the resident's opinion about the raising of the river bank, maintenance of the river bed and measuring the flood gate. Now it is shown that 46% people give importance about the maintenance of river bed.

### 4. People's reaction to the disaster situation

The opinion of the people about the local city's government's responsibility can be displayed below by figure 3. In this part; questionnaire was aimed to get an idea of their satisfaction level to the administrative correspondence and the levee protection facility of administration. It was asked to express their satisfaction about the city authorities overall performance against the terrible flood situation.

Here the analysis of figure 3, according to the respondent's answer, it can be said that they were not happy with the measures taken by the city to control the flood situation. That is why a significant percentage of the people said in their opinion that this kind of situation was not expected.

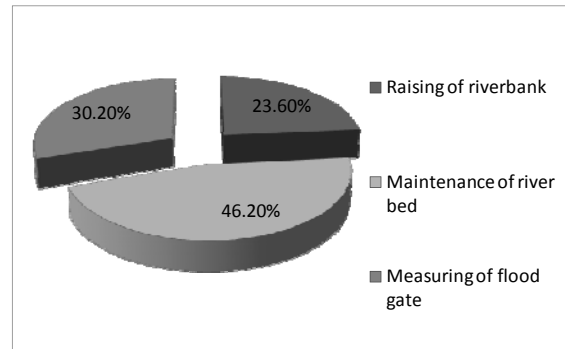


Figure 2: Residents' awareness to flood risk n= 1,496

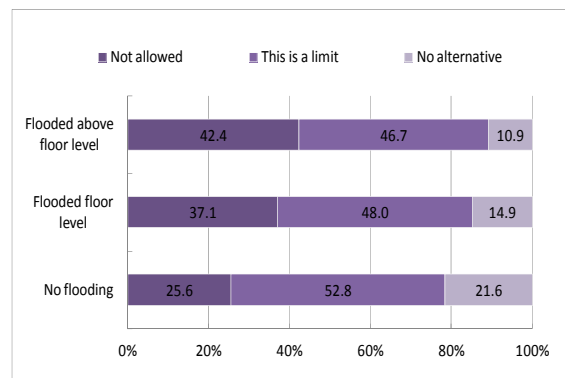


Figure 3: People's reaction to the disaster situation n= 1,643

### 5. Conclusion

A major flood disaster occurred in Ishikawa prefecture on 28 July 2008 as a result of heavy rainfall that exceeded the design scale of the river infrastructure. Flood waters breached the levees in downstream urban areas, causing tremendous damage. The main factor contributing to increased flood hazard was the levee failure due to flood waters far exceeding the design scales of the rivers, which increased the force and volume of the flood waters. Recently the localized torrential heavy rain is increasing in Japan as well as other regions of the world. To protect human lives and properties, lesson from the damage of Asanogawa River flood can be very significant.

### Reference:

- 1) Becker, A. and Grunewald, U., Flood Risk in Central Europe, Science, vol. 300, pp1099.
- 2) Ishikawa Prefecture Disaster Prevention Headquarter.
- 3) Ministry of Land, Infrastructure, Transport and Tourism, Japan: The Flood Report, 2008