TORRENTIAL HEAVY RAIN AND FLOOD DISASTER: THE JULY 2008 FLOOD IN THE ASANOGAWA RIVER BASIN

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1. Introduction

On 28 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.

The muddy flood water flowed into fields and rice paddies, fruit trees were washed down, and the rice was filled up with a large amount of mud. In several areas where the river narrowed, or at bends, flood waters overflowed the dike. Because of delays in closing the floodgate, the river overflowed at opening in the dike called ‘kirikaki’. This heavy rainfall caused overtopping from the Asanogawa River running through the downtown of Kanazawa City, inundation water depth over 1 m and large amount of sediment deposition in the city area. This disaster is referred to as the Asanogawa flood of 2008

Fig.1 Asanogawa River’s Location in Japan

Fig.2 Asanogawa River in Kanazawa, Ishikawa

2. Outline of Asanogawa River

In Ishikawa prefecture, there are two main rivers namely Saigawa (34.5km) and Asanogawa (28.9km). Asanogawa is flowing in the center part of Kanazawa city. This river flows very gently and offers a moderate waterfront to the citizen living around it. In the past 55 years no floods have occurred in Asanogawa River which has no dam. The last flood disaster occurred in 23rd July 1953 e.g. the Kaga Flood of Asanogawa River (Ishikawa-ken Disaster Prevention Headquarter 2008).

3. Amount of rainfall

Maximum precipitation reached to 60mm/hr at Iouzen (JMA) and 138mm/hr at Shibahara-bashi (prefecture). According to the observation of Ishikawa-ken, at Shibahara-bashi (which joint place of Asanogawa and Iouzen Yamagawa), there was a rainfall of 251mm in 3hours (5a.m to 8a.m). In the mean time, from 6:30a.m., there was rainfall of 138mm in 1hour (Ishikawa-ken Disaster Weather Information 2008).

4. Damage in the upper and middle basin area

Though there was no death report for Asanogawa Flood disaster 2008 but a lot of properties had been destroyed. 2 houses were completely washed away and 6 houses were destroyed in half parts (Ishikawa Prefecture press release). The overall inundation damage by the flood is shown in the table 1 (Questionnaire survey, urban and transportation planning Lab, Kanazawa University). The middle basin e.g. the inside of down town areas was much more affected than other basins.

Table 1: Asanogawa basins, districts, households and damage

Basin	The district name	Number of the households	Inundation Damage
Upper basin	Yuwaku	462	Above the floor or the floor bottom
Middle basin	Zaimokucho	2,822	partly
	Baba	1,508	Above the floor or the floor bottom
	Meisei	2,974	Above the floor or the floor bottom
	Kousaka	4,376	Partly
	Moriyamamachi	3,606	Partly
	Asanomachi	2,820	Above the floor or the floor bottom
	Moroemachi	6,523	Partly
Lower basin	Asanogawa	1,769	Partly
	Oura	2,756	Partly

Photographs: Flooding circumstances of Kanazawa city

5. 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 (Fig.3, Questionnaire survey, Urban and Transportation Planning Lab, Kanazawa University) it is shown that their concern is rising up.

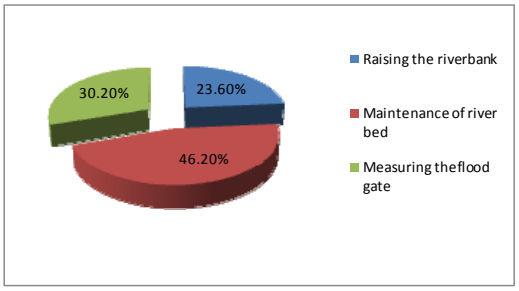

Fig.3 Residents' awareness to flood risk

6. 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. Observing the characteristics of this flood and heavy rainfall, it can be conclude here that- (A) the flood was of a low probability but high consequences type; that is, an event that rarely occurs, but results in catastrophic damages when it does occur. (B) 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. (C)Recently the localized torrential heavy rain (that is said *guerrilla* 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.

References:

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4) Earth Science (Chikyu Kagaku) vol.63, pp107-112, 2009

5) Questionnaire Survey data (distributed on 2008/9/1-2008/9/4), Urban and transportation Planning Lab., Kanazawa University