SUMMARY

Development of the Urban Flooding Risk Prevention System (II)

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As urban flooding is becoming more serious, the national disaster policy calls for expert groups' participation, technical infrastructure, and institutional settings necessary for central and local governments, and other groups to take their own roles with bigger responsibilities. With a focus on technical infrastructure, this 3-year project aims to develop a policy supporting system, which can be used to relieve persons in charge of urban planning in municipalities of technical burdens, and offer the responsibility to necessarily implement the minimum level of disaster prevention measures.

At the 2nd year step of the project, we carried out five studies, as follows.

First, we developed information useful for persons in charge of urban planning to easily recognize risks due to urban flooding within their administrative boundary. We thus calculated and presented two indicators: (1)

the total area of low-lying region near local rivers, which will help them understand geomorphic features related to the occurrence of urban flooding; (2) the total area of the natural hazard management district, which will help them to understand the current degree of precautions to urban flooding.

Second, we attempt to provide more technical and more reliable risk information for the area at high risk due to urban flooding (called a priority management site, PMS). To provide those information, we applied the prototype of risk assessment methods which were proposed at the 1st year step to two municipalities, Gangju and Pocheon. We thus (1) identified the boundary of PMS through selection of municipality, investigation of past damage records, field investigation and interview, and also geo-hydrological data analysis, (2) generated future rainfall scenario data with consideration of climate change impacts on probabilistic characteristics of short-term rainfall, (3) analysed various reasons of urban flooding by using simplified hydraulic methods. Based on the results of hydraulic analyses, moreover, we could develop various risk maps regarding hazard, impact, exposure, and vulnerability. With all results together, we could confirm methodological possibilities in both reliability and practicality.

Third, we newly proposed the method to spatially determine risk hotspots in PMSs in order to help the persons in charge plan and execute urban flood management measures at proper locations. To this end, we (1) set out the evaluation criteria according to gridded risk information which can be acquired from the system, (2) linked a pairwise comparison method, AHP, with a priority rank method, PROMETHEE so that grids with higher priority

could be selected as risk hotspots.

Forth, we initiated the development of urban flooding risk prevention system as a 'vessel' for all project outputs and also for a 'messenger' between system managers and system users. We then defined and designed the DB to be constructed according to the function of the system delineated at the 1st year step. Also, we carried out system design with a focus on display on the user environment.

Fifth, we examined the strategies for improving usability of the system operation. To this end, we proposed to implement the preliminary project togeter with municipalities at the 3rd year step. Also, we called for the revision of the current manual for disaster prevention urban planning.