

## Predicting and solving the dangers of flood in urban basins caused by torrential rain falls: Based on case studies of ansan stream and hwajeong stream

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Recently, Korean urban areas have been suffering from frequent flooding disasters caused by abnormal climate that increased the frequency of heavy rainfalls. Therefore, this research was conducted to examine and assess the vulnerability of the urban areas to heavy rainfalls and to propose a viable solution in preventing floods by assessing the case of Ansan City.

First, in order to determine the status of Ansan City's flood precaution, a simulation of heavy torrential rain was run on Ansan urban basins using a model named CAMEL. The result showed that 35% of the urban basin is flooded within 30 minutes of rainfall. After 60 minutes of rainfall, even though flooding areas stayed approximately the same, flooding exacerbated in terms of its depth, with approximately 1.2km<sup>2</sup> of Ansan's already flooded area experiencing water level higher than 1m. Simulation showed that regions most vulnerable to flooding are areas around the upper Hwajeong Stream near Hwajeong Elementary School, the intersection between 1st Wolpi Bridge and the entrance of Ansan IC, and etc.

To prepare flood prevention measures, this research has drawn up scenarios to improve the infiltration capacity of the soils and to reduce impervious surfaces in urban areas by adjusting saturated water content and hydraulic conductivity. Only when the water content and the hydraulic conductivity were adjusted together, did Ansan City see a significant reduction in flooded areas by a percentage between 2.24% and 7.28%.

However, these methods alone are not sufficient enough to allow a complete control over flooding issues in the urban basins because of the topographical characteristics of Ansan city. Thus, apart from the previously proposed solution to increase infiltration and decrease impervious surfaces, an upgrade on the artificial water discharge system is indispensable for Ansan City to prevent flooding disasters.

### Biography

So Yon Kwon is a senior attending Hankuk Academy of Foreign Studies, a prestigious foreign language high school in Yongin, South Korea. She is an active member her school's environment club aimed at combating deforestation and writes articles related to the marine environment for the NGO OSEAN. Since her junior year, she has been interested in studying the case of Lake Shihwa in Ansan and its related environmental significance.

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