

## Early Warning System Development in Mountainous Area

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### (a) Purpose of study or research hypothesis

In the past few years, various damages have occurred in the vicinity of rivers due to flooding. In order to alleviate such flood damage, structural and non-structural measures are being established, and one of the important non-structural measures is to install a flood warning system. Comparing with the currently constructed flood warning system, it is to calculate how many flood warnings are declared per year in the future with changed rainfall characteristics.

### (b) Key issue(s) or problem(s) addressed

Most of the basins in South Korea are small with very short concentration time. Such basins often contain either a developed city (and/or) mountain, that is highly vulnerable to flooding. The assessment of impact of climate change on floods is a critical concern in the Jinju basin. To mitigate the impact guidelines for the design of hydraulic and hydrologic structures and flood warning system is need to be upgraded according to the future climate scenarios.

### (c) Methodology or approach used

It is to calculate the precipitation in 10-minute units considering climate change, and to calculate the warning precipitation corresponding to the critical flow through the GIUH rainfall-runoff model. And the limiting flow was calculated through the HEC-RAS model in order to downscale daily precipitation data to 10-minute precipitation, In this study, NTD based on KNNR and GA and Population-based NTD model(PNTD) were used.

### (d) Results or conclusions derived from the project

In the current flood warning system installed in the Jinju small Basin about mountainous area, it is judged that a warning is issued 3 to 4 times per year for a precipitation of 14 to 17 mm in 20-minutes. However, according to future climate change, it is judged that the annual flood warning system in the future will increase compared to the present when referring to the 10-minute precipitation corresponding to the critical flow.

### (e) Implications of the project relevant to congress themes

According to future climate change, rainfall characteristics are changing. As a result, the risk of flash floods in mountain basins and small basins is increasing. Since the concentration time of runoff in mountainous areas is less than 1 hour, it is necessary to assess the impact of climate change on flooding in the area.

**Keywords** : Forecasting, Flood Warning System, Climate Change, 10minute Precipitation