

# Water balance Change of the Han River Basin by climate change

**YONGCHAN KIM<sup>1</sup>, DONGKYUN KIM<sup>\*1</sup>**

<sup>1</sup>*Hongik University*

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

This study analyzed and evaluated the effects of climate change on the hydrological cycle factors and water resources of the Han River basin by quantitatively predicting the changes of future water balance through the modeling of a hydrological model in the Han River basin.

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

Drought tended to occur more frequently in the future period as the deviation of precipitation became more severe.

## **(c) Methodology or approach used**

In order to utilize the radar rainfall time series data, a distributed hydrological model VIC (Variable Infiltration Capacity), which can be analyzed in grid units, was used, and Conditional Merging (CM) method was used for the rainfall data to build the model.

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

I first calibrated for that period (2009-2014) and then validated the period (2014-2019). NSE values for the calibration and verification periods were 0.968 and 0.569 respectively, with good results. Drought tended to occur more frequently in the future period as the deviation of precipitation became more severe.

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

In recent years, the frequency of extreme floods and droughts on the Korea due to climate change is increasing rapidly. With the occurrence of such an extreme climate, the fluctuation in annual precipitation is expected to increase and the water shortage problem is expected to intensify in the future. Under certain circumstances, even when water becomes scarce, it is necessary to secure a minimum amount of water intake for people's basic life and a minimum flow rate to maintain the environment.

**Acknowledgement :** This work was supported by the National Research Foundation of Korea(NRF) grant funded by the Korea government(MSIT) (No. NRF-2021R1A2C2003471)

**Keywords :** Climate change, Water budget