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Prediction of flood risk under the impact of climate change on the thermal power plant using one dimensional hydraulic model

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This research provides a mathematical approach for estimating the flood risks due to the effects of climate change by developing a one dimensional (1D) hydraulic model for mountainous river reaches located closely to the Yeongwol thermal power plant. Input data for the model, including topographical data and river flow measured every 10 minutes from July 1st to September 30th, 2013 by Han River Flood Control Office (HRFCO), were imported to a 1D hydraulic model. Output results were the simulated water levels, water discharges and average flow velocities at each cross-section. The simulated water levels in different years (including 2011, 2012 and 2014) were used to calibrate and validate the applied model. Climate change scenarios were estimated by referencing the climate change adaptation strategies of the Korean government and historical information about the extreme flood event in 2006. The downstream boundary was determined as the friction slope which is 0.001 and the roughness coefficient of the main channels is 0.036. This model demonstrates the significance of riverbed widening strategy through the six flooding scenarios to reduce inundation depth and flow velocity which impact on the power plant. In addition, the impact of upstream Namhan River flow is more significant than Dong River.

Biography

Nguyen Thanh Tuu has his expertise in hydraulic modeling and system dynamics modeling for the environmental management and climate change research. During his working time at the Research Institute for Climate Change, Can Tho University, he has opportunities to do the projects with modeling the impact of climate change on water resources and rice production. He has his high grade Master degree on Natural resources and Environmental Management at Can Tho University, Vietnam. Currently, he is doing Ph. D. at the Department of Environmental Science and Biotechnology, Hallym University, South Korea, on the project "Research & Development Center for reduction of Non-CO_2 Greenhouse gases (2016001690005)" funded by Korea Ministry of Environment as "Global Top Environment Research & Development Program".

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