

## **NATIONWIDE ASSESSMENT OF THE DEGRADATION OF FLOOD DISASTER MITIGATION EFFECTS OF RIVER IMPROVEMENT WORKS DUE TO GLOBAL CLIMATE CHANGE**

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Ministry of Land, Infrastructure, Transport and Tourism (MLIT) is struggling to implement adaptation measures against floods under the global climate change, since its importance has been emphasized, for example, in the policy report "Measures to adapt to climate change due to global warming that causes flood disasters" by the Panel on Infrastructure Development, MLIT, submitted in June 2008.

Since Japan is much vulnerable to flood disasters because of the high density of land use and the deep dependence on alluvial plains, the river improvement projects have been carried out toward the safety level prescribed in the river improvement framework plans, though the gap between the prescribed and achieved safety levels still exists. Under the global climate change, additional river improvement work is to be needed for making up for the increased flood discharge, if we attempt to secure the same target safety level. It is important, therefore, to estimate this additional amount of river improvement work in comparison with the amount of river improvement work planned in the current river improvement framework plan as a key index of overall difficulties in coping with GCC impacts on flood disaster mitigation policies. How it will be affected by the range of torrential precipitation projection due to the uncertainty over the calculation of future climate change is also important for discussing the adaptation measures against floods under the global climate change.

The authors have estimated the median and the confidence intervals of the rate of increase of following three values, flood discharge, amount of river improvement work, and probability of exceedance (for representative flood discharge, e.g. 1/100 year flood discharge on the current river improvement framework plan) for major rivers in Japan. For this estimation, the authors calculated the median and the confidence intervals of the rate of increase of the annual maximum rainfall per day in each region from the results of 20km mesh Global Circulation Model and 5km mesh Regional Circulation Model simulations conducted by Meteorological Research Institute, Japan Meteorological Agency, MLIT. The estimation has been conducted for two periods, one for about 30 years later from now, and another around the end of 21<sup>st</sup> century. The authors have drawn nationwide figures indicating the results above.

This estimation method provides one of the useful tools for capturing basic nationwide information mentioned above, and it will contribute to the research and discussion on the specific adaptation measures against floods. It has been shown that the rate of increase by GCC impacts and its confidence interval of future rainfall are amplified as it is transformed into flood discharge, river improvement work, and probability of flooding. These results implicate that we should discuss the specific adaptation measures considering the large uncertainty of the three factors.