Abstract

[Project Information]

Project Title :	Projection of Climate Change Impacts and Evaluation of Adaptation to Natural Disasters and Water Resources
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Principal Investigator :	Yokoki Hiromune
(PI ORCID) :	
Principal Institution :	Department of Urban and Civil Engineering, College of Engineering, Ibaraki University Hitachi city, Ibaraki, JAPAN Tel: +81-294-38-5219 E-mail: hiromune.yokoki.hy@vc.ibaraki.ac.jp
Cooperated by :	Setsunan University, Ehime University, Kyoto University, National Institute for Land and Infrastructure Management, Tohoku University, Fukushima University, Toyama Prefectural University, National Agriculture and Food Research Organization, Okayama University, Kansai University
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[Abstract]

In this study, a comprehensive methodology was developed and refined for projecting climate change impacts and evaluating adaptation strategies related to natural disasters and water resources in river basins and coastal areas. The approach incorporates future changes in social dynamics to enable integrated forecasting and assessment.

Throughout Theme 3, the research team developed and improved methods to project the impacts of climate change on natural disasters and water resources using a high-resolution (1 km) mesh. These methods allowed both physical impacts and direct damages to be estimated while accounting for future socio-demographic transitions. By utilizing the standardized scenarios—such as climate and socio-economic scenarios—provided by Theme 1, the study projected impacts of sea level rise, storm surges, and flooding from river and inland water sources. Additionally, a nationwide high-resolution (1 km) water resource assessment model was constructed to estimate the effects of climate change on water demand and supply. These efforts enabled the identification of regional characteristics of climate-related impacts and the extraction of the areas vulnerable to specific types of hazards.

The team also conducted a quantitative evaluation of adaptation measures, considering both hard and soft strategies, in the domains of natural disasters and water resources. For flood risks driven by sea level rise and river inundation, the effectiveness of adaptation through protection and managed retreat was assessed. For sandy coastlines, engineering-based adaptation measures were evaluated for their ability to mitigate coastal erosion. For selected key ports, construction techniques and costs for adaptation to storm surges were analyzed. For groundwater resource depletion, the effectiveness of multiple adaptation strategies—such as water use reduction and aquifer recharge—was quantitatively assessed.

In summary, this study enabled a comprehensive projection of climate change impacts and evaluation of adaptation strategies related to water-related disasters and water resources in both river basin and coastal regions. The findings are expected to contribute significantly to future climate impact assessment reports and the development of adaptation plans by national and local governments.

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