

Session 7

Assessment of Comprehensive Impacts and Effectiveness of Adaptation Measures in Japan

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<Objective>

This study (S-8 project) aims at assessment of various distinct climate stabilization levels, impact level according to adaptation policy, and its adaptation effect using a state-of-the art climate scenario utilized in IPCC Fifth Assessment Report. Japanese IAV researchers involved in S-8 project cooperatively conducted a study on comprehensive impact assessment and adaptation nationwide. The S-8 project, "Comprehensive Study on Impact Assessment and Adaptation for Climate Change (from FY2010 to FY2014)," is one of the Environment Research and Technology Development Fund of the Ministry of the Environment, Japan.

<Method and Scenario>

Future scenarios: Prevailing socioeconomic conditions in Japan would remain constant into the future. RCP2.6, 4.5, 8.5 and for GCMs (MIROC5, MRI-CGCM3.0, GFDL CM3, and HadGEM2-ES) were applied and climate scenarios for impact assessment are prepared for the S-8 common scenario. Base period (1981-2000) and two future periods (mid-21st century: 2031-2050, end of the 21st century: 2081-2100) are set for targeted periods.

Impact indicator: The targeted fields and indicators are as follows. Water resources (volume of water: river flow, quality of water: chlorophyll a), coast/disaster prevention (flood: flood damage cost, sediment disaster: landslide probability, landslide damage cost, storm surge disaster: storm surge damage cost, coastal erosion: sand beach loss rate, sand beach damage cost, tidal flat loss rate, tidal flat damage cost), ecosystem (natural vegetation: *Pinus pumila* potential habitat, *Abies veitchii* potential habitat, *Fagus crenata* potential habitat, *Fagus crenata* damage cost, *Quercus acuta* potential habitat), agriculture/food production (rice: yield, fruits: persistence rate of suitable cultivation area for Citrus Unshiu and distribution rate of suitable cultivation area for Citrus Tankan), health (summer heat: heat stress excess mortality, heat stroke death damage cost, the number of heat stroke patients taken to hospital, infection disease: *Aedes albopictus* distribution).

Setting adaptation: Quantitatively assessed indicators of adaptation effect include the following five; flood damage, landslide, *Fagus crenata* potential habitat, rice yield, and heat stress excess mortality.

<Results>

It is projected that global warming exerts impacts on a variety of fields in Japan throughout 21st century. The impact of disasters related to extreme weather, health effects such as heat stress, impacts on water resources, agriculture and ecological changes, are expected to be wide in scope and extent affecting; 1) national health, safety and security, 2) national life quality and economic activity, 3) ecosystems.