

Climate Change Impacts on Hydrology, Water Resources and Water Use Sectors: Cases from Asian Countries

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ABSTRACT

Climate change is expected to have multiple impacts on water sector through alteration in climatic variables, sea level rise, hydrologic cycle, water availability, and its spatial and temporal distribution, water demand/use for various economic activities, frequency of extreme hydrologic events, water quality affecting its uses, and ecosystems as a whole.

This presentation highlights global and regional perspective as well as local insight of climate change impacts on hydrology and water resources, including erosion and sediment, and on water use sectors, namely municipal, agriculture and irrigation, hydropower etc. The studies at basin level used downscaled climate data from multiple GCM/RCM for different IPCC emission scenarios, and various tools to assess the impacts in different Asian countries. These research projects include:

- Assessment of future climate and its impact on
 - (a) Hydrology and water resources in Kabul Basin, Afghanistan; Nam Ou Basin, Lao PDR; Bagmati, Tamakoshi and Koshi Basins, Nepal; Upper Indus Basin, Pakistan; Ping, Mae Klong and Pak Phanang Basins, Thailand; and Ba River Basin and South Central Coast, Vietnam;
 - (b) Snow cover in Tamakoshi Basin, Nepal;
 - (c) Urban flooding in Bangkok, Thailand;
 - (d) Water quality in Saigon River System, Vietnam;
 - (e) Soil erosion and sediment in Nam Ou Basin, Lao PDR; and Upper Nan Watershed, Thailand.
- Assessment of impact on future municipal water demand in Bangkok, Thailand.
- Assessment of impact on rice yield in Chi-Mun Basin, Thailand; maize yield in Sikkim, India; and maize yield in wet and dry agro-ecological zones, Uganda.
- Assessment on irrigation water demand in Citarum Basin, Indonesia; Upper Indus Basin, Pakistan and in Mae Klong River Basin, Thailand.
- Assessment of impacts on hydropower in Wangchu Basin, Bhutan; Dudhkoshi Basin, Nepal; Jhelum Basin, Pakistan; and Mae Klong Basin, Thailand.

The key challenges from research and application/policy perspectives are also presented for discussion.

KEY WORDS: *Climate change, Hydrology, Water resources, Sediment, Impacts, Water use sectors*