

Impact of the Mekong River Flow Alteration on the Tonle Sap Lake in Cambodia

Lee, Giha*, Kim, Joocheol**, Jung, Kwansue***, Lee, Hyunseok****

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ABSTRACT

Rapid development in the upper reaches of the Mekong River, in the form of construction of large hydropower dams and reservoirs, large irrigation schemes, and rapid urban development, is putting water resources under stress. Many scientific reports have pointed out that cascade dams along the Mekong River lead to serious problems: not only hydrologically but also a decline of agricultural productivity due to a decrease of sediment supply in the Mekong Delta and a change of fish amount due to drastic change of the water environment. Cambodia and Vietnam, located in the lowest Mekong basin, are gravely affected by radical changes of hydrologic regime due to Mekong River developments. In particular, the Tonle Sap Lake in Cambodia is very sensitive to the flood cycle and flow variation of the Mekong River as well as inflow water quality from the Mekong River. More than 50% of Cambodian GDP depends on the primary industries such as agriculture, fishing, and forestry, and the Tonle Sap Lake plays an important role to support the national economy in Cambodia. In addition, Cambodian people usually take nourishment from the fish of Tonle Sap Lake. This research aims to assess the impacts of the Mekong river flow alternation on the hydrologic regime of the Mekong River - Tonle Sap Lake. We carried out rainfall-runoff-inundation simulation using CAESER-LISFLOOD for integrated water resource management in the Tonle Sap Basin and then analyze flood inundation variation of the Tonle Sap Lake due to the scenarios. Furthermore, the simulated inundation maps were compared to MODIS satellite images for model verification and hydrologic prediction.

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* Assistant Professor, Dept. of Construction and Disaster Prevention Eng., Kyungpook National University, Korea

** Senior Researcher, IWRI, Chungnam National University, Korea

*** Professor, Dept. of Civil Eng., Chungnam National University, Korea

**** Head of Research Center, HQ Tech, Korea