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The influence of trans-basin water allocation on regional water balance in Taoyuan tableland in north Taiwan

Hui-Chun Chiang, Chuen-Fa Ni, Che-Ping Lin, and Yun-An Wu
National Central University, Institue of Applied Geology , Earth Science, Taiwan (eee227848@gmail.com)

The Shihmen Reservoir has been in operation for more than 50 years and is located upstream on the Dahan River. Over fifty-five percent of the reservoir outflow is allocated from the Dahan River basin to support irrigation and industrial or domestic water usage on the Taoyuan tableland. The trans-basin water allocation and thousands of irrigation ponds across the Taoyuan tableland create unique landscapes characteristic of northern Taiwan. Such intensively managed landscapes, regions of significant land-use change, serve as sources of economic prosperity. The objectives of the study are to assess and quantify the influence of the trans-basin water allocation on the regional water budget. The study uses hydrogeological observations and empirical models to estimate water budget in the Taoyuan tableland. Based on collected data from 2000 to 2007, the allocated water from Shihmen reservoir is 2.88 billion tons per year, which contributes 66.6% of water resources in Taoyuan tableland. The precipitation in the Taoyuan tableland is 1.44 billion tons per year (33.4%). Because the allocated water is mainly for irrigation use (50%), large amounts of infiltration and evaporation are from the water resource from Shihmen reservoir. With available climate conditions and water allocation policies, the developed workflow for water budget can serve as an evaluation tool for regional water resource management.