



Integrated System Dynamic Modeling of Water and Power for Reservoir Operation under Climate Change Impact - a Case Study of Shihman Reservoir Taiwan

Kai-Yuan Ke (1), Ya-Zhu Yu (2), and Yih-Chi Tan (2)

(1) Center for Weather Climate and Disaster Research, National Taiwan University, Taipei, Taiwan (kent0115@gmail.com),

(2) Department of Bioenvironmental System Engineering, National Taiwan University, Taipei, Taiwan

Shihman Reservoir is a multi-functional hydraulic infrastructure located in northern Taiwan. It was established for 5 goals, including irrigation supply, power generation, flooding control, public water supply and tourism. From water supply aspect, the reservoir provides irrigation water for 7000 thousands Hectare as well as domestic and industrial water for 22 townships in Taoyuan, Hsinchu and New Taipei City. Flooding control is significantly related to water supply especially when drought is expected or high water demand season is coming. Releasing water from reservoir should be carefully considered in case of water shortage happened due to inappropriately reservoir water operation. As for the power generation aspect, it becomes more important because of high power demand in the summer season. Weather is getting hotter in Taiwan so the power shortage happens frequently in recent year mainly due to air conditioning use. The study aims on the trade-off between water supply regarding flooding control and power generation via system dynamic modeling for reservoir operation. Except for the present weather condition, detailed investigation is conducted for climate change scenarios to understand potential water or power shortage in the near future.