

Natthaphon Gerdsuk 2008: Inundation Characterization in Tha Chin River Basin by GIS Analysis and Watershed Modeling. Master of Engineering (Irrigation Engineering), Major Field: Irrigation Engineering, Department of Irrigation Engineering. Thesis Advisor: Assistant Professor Ekasit Kositsakulchai, Dipl. Docteur 180 pages.

This research presented the study results of inundation characterization in Tha Chin River Basin. Extends of inundation and levels of severity were identified using time-series Normalized-Difference-Water-Index (NDWI) data, derived from Terra/Aqua MODIS images. The volume of excess water from unregulated area was estimated by Genie Rural (GR) rainfall-runoff model; from irrigation service area by Water Evaluation And Planning system (WEAP) model. It was found that zones of high inundation severity were located in central part of Tha Chin river basin, especially in Pho Phraya Irrigation Project. The inundated area was more than half of project area, and inundated period was longer than three consecutive months. Sources of inundation were excess water flowing from: (1) unregulated area in the west of Tha Chin basin (out of irrigation service area), (2) Upper part of the Chao Phraya West Bank Irrigation Project, and (3) the Greater Mae Klong Irrigation Project. All waters drained into Tha Chin river through Song Phi Nong (SPN) drainage canal. The annual volume of flow in SPN canal, estimated by WEAP model, was more than 2,000 Million m³. In dry season (January to May), water in SPN canal was diverted from Mae Klong river via Jorrakae Samphan canal. In wet season, excess water from irrigation service area and unregulated area accumulated in the canal. Since, Pho Phraya Project was situated in the lower area and received flow from its neighborhood; it is difficult to have an absolute solution for this area. Therefore, it is necessary to assess its flood storage capacity in order to prepare flood mitigation plan.

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