

Wachira Surin 2014: The Study of Water Resources Management for Increasing Irrigation Area in First Part of Mun River Basin. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Miss Wandee Thaisiam, Ph.D. 219 pages.

First part of Mun river basin consists of nine sub-basins that locate in Nakorn Ratchasima and Buriram provinces where 747,561 rai of irrigation areas are supplied by medium and large size of reservoirs in the study region. The objective of this study is to simulate the current water usage in the first part of Mun river basin in order to appropriately increase the irrigation area for 14 irrigation projects by using WUSMO program. The program is employed to determine the water consumption of rice field and MIKE BASIN model is used to model the river basin in the region of interest. As a results, we obtain the water balance in the area. In this study, the water usage of first part of Mun river basin is analyzed for three different cases. Case 1 is to simulate the current water usage in the study area whereas Case 2 is to foresee water usage in the next 5-year and Case 3 is to determine water usage in the next 5-year with the condition of 4-m increase in retention water level of Lamprapleung. In this work, we only take into account the water usage of irrigation areas, water demand of Provincial Waterworks Authority and water release for environmental in the first part of Mun river.

The outcome of current water usage of the first part of Mun river basin show that the quantity of water storage in reservoirs can supply all activities without water shortage. The simulated results for Case 2 indicate that reservoirs can adequately provide water for general consumption demand. The irrigation area in dry season for every project can be increased from 30% to 50% of total irrigation area, except for Lumprapleung project, it can only be increased to 40% of the total area. For Case 3 with the addition of 4-meter rise in retention water level of Lumprapleung reservoir, the quantity of water storage of reservoirs can support all water activities in the study area. In the dry season irrigated area can also be increased from 30% to 50% of total irrigation area for every project. Moreover, the irrigation area in Thungsamrit can has an addition area of 15,923 rai without water shortage.

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Thesis Advisor's signature