

3836307 ENRD/M : MAJOR : ENVIRONMENTAL PLANNING TECHNOLOGY FOR  
RURAL DEVELOPMENT; M.Sc. ( ENVIRONMENTAL  
PLANNING TECHNOLOGY FOR RURAL DEVELOPMENT )

KEY WORD : WATER BALANCE / DESIGN / CROPPING PATTERN

PORNTIP LIMLAHAPUN A STUDY OF WATER BALANCE FOR CROPPING  
PATTERN DESIGN : A CASE STUDY OF HUAI CHONE RESERVOIR. KHAO  
HINSORN SUB-DISTRICT, PHANOMSARAKAM DISTRICT, CHACHOENGSAO  
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ISBN 974-589-892-9.

Thailand is an agriculture country. Agriculture development is necessary for the development of potential in each area regarding physical, economic and social factors, so the quantitative status should be known to use and look at the trend of data to facilitate management. One irrigation area was selected to be a case study. The main objective of this study is to study the reservoir area in terms of quantitative physical characteristics such as physical of soil, climate, economic, social, to define type of crops and period time of plants that are concerned with all factors, and to forecast the water demand by balancing it with the total reservoir water quantity in a suitable way for use by agriculturists.

Collection of all information from every family in this area of Huai Chone reservoir, characteristics of agriculturist information, type of crops and the reason for farmers' selection of type of crops was done. An information database was then created for use in selecting type of Crops and Management of Crop Pattern design. The designs were then used for Water Balance Study by WUSMO ( Water Uses Study Model ). Results were analyzed to determine Water Balance demand and Total Water supply.

The result of the irrigation demand model shows that the average of diversion demand was 0.43 mcm. per year, total of rainy season field crop 241 rai, in both rainy season and dry season vegetable crop 20 rai and perennial 110 rai. From basin system simulation model, by using the characteristics of the reservoir such as retention storage, volume-elevation curve, area-elevation curve and evaporation, including inflow, then the average of total release was 0.42 mcm. per year which is sufficient for demanding of cropping pattern above. Nevertheless, there will be a risk of shortage for 3 years (0.02 mcm per year) out of 30 years. Irrigation demand as determined by the new model was found to result in average of diversion demand of 0.46 mcm. per year, total of rainy season field crop 358 rai, in both rainy season and dry season vegetable crop 14 rai and perennial 90 rai. From basin system simulation, the average of total release was 0.44 mcm. per year, and there will be a risk of shortage for 3 years (0.03 mcm per year) out of 30 years. New cropping design model can increase growthing of field crop area by about 117 rai. That growth area will be useful, increasing crop production, which implies an increasing income also.