3536225 ENTM /M : MAJOR :TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT ; M.Sc.(TECHNOLOGY OF ENVIRONMENTAL MANAGEMENT )
KEY WORD : FARM PLANNING / DRY SEASON / LIMITED WATER SUPPLY / LINEAR PROGRAMMING

SUTHEP TANGSUP : OPTIMAL DRY SEASON FARM PLANNING UNDER LIMITED WATER SUPPLY, A CASE STUDY : ELECTRICAL PUMPING IRRIGATION AREA OF BAN HUA DAN PROJECT, UTTARADIT PROVINCE, THESIS ADVISOR : SANSANEE CHOOWAEW, Ph.D., JESDA KAEWKALAYA, Ph.D., SARUNYA SUTJARITKUL, M.Sc., KONGDET TONKAYA, M.Sc. 198 p.
ISBN 974-589-160-6

Optimal dry-season farm planning using linear programming model is carried out under various water supply constraints: not over the normal 5 million cu.m. and decreased to 4, 3, 2 and 1 million cu.m. Farm activities include 6 kinds of crops: second rice (irrigated paddy), maize, soybean, groundnuts, mungbean and sorghum, on the project area of a total of 3,000 rai of the electrical pumping irrigation station of Ban Hua Dan, Tron, Uttaradit. The study area is classified into 5 types of soil characteristics: Tha Muang Series; low land Ratchaburi Series; up land Ratchaburi Series; San Pa Tong Series and Nam Pong Series, of which areas are 1,396, 336, 372, 57 and 839 rai, respectively.

Optimal dry-season farming activity under all levels of limited water supply is growing irrigated paddy if the cost of irrigation water varies according to the water volume used. The maximum net benefits over cost under 5 levels of water supply are 2.709, 2.539, 2.269, 1.823 and 1.104 million baht. The second best plan is growing irrigated paddy if the cost of irrigation water is fixed, as it is at present at 177.84 baht/rai for irrigated paddy and 200 baht/rai for the others. The net benefit are 2.376, 2.153, 1.830, 1.322 and 0.703 million baht. Both plans suggest growing only irrigated paddy under the normally limited water supply (5 million cu.m.) in all 5 soil types and all the project area. When limited water supply is stronger, decreased into 4 ,3 ,2 and 1 million cu.m., the farm plan still selects growing irrigated paddy in the low land and up land Ratchaburi soils. Irrigated rice is suggested to give way to groundnuts and mungbean in San Pa Tong, Nam Pong and Tha Muang soils.