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LAKKANA KAEWVICHIT : A COMPARATIVE STUDY ON COST - BENEFIT OF RICE - FISH CULTURE UNDER DIFFERENT RATES OF CHEMICAL FERTILIZER APPLICATION IN BANGPLAMA DISTRICT SUPHANBURI PROVINCE. THESIS ADVISORS: SANSANEE CHOOWAEW, Ph.D., PIROM CHANTHAWORN, Ph.D., ARTHIT NAMASONDHI, M.Sc. 163 P. ISBN 974-664-074-7

A comparative study on cost and benefit of rice culture and rice-fish culture under different rates of chemical fertilizer application was carried out in a farmer's field at Bangplama district, Suphanburi province. The experiment was done during the second crop, transplanting rice cultivation. Mixed chemical fertilizer 16-20-0 was applied at the rate of 30 kg/rai on day 7 after transplanting and urea fertilizer 46-0-0 was applied at 15 kg/rai, 60 days after seedling, as recommended by the Department of Agriculture. There were 5 treatments: rice culture with 100% fertilizer application and rice-fish culture with 100, 75, 50 and 25% chemical fertilizer application, with three replications, 5x5 m^2 (25 m^2) per plot. Sex reversed *Oreochromis niloticus*, 11 cm in length and 25-30 gm in weight, were stocked at 4 fish/m^2 and KLG 83055-1-1-1-2-1-4 rice variety was grown at the rate of 6 kg/rai. Rice bran was used as fish food at the rate of 5% of fish body weight once a day and neem extract 100 cc/40 litres of water/rai ,was used as pesticides. The production cost and benefit were recorded. Cost-benefit analysis, net present value, benefit-cost ratio, internal rate of return and sensitivity were analysed for 1 rai in 10 years period and 12% of discount rate.

The results indicated that there was no difference between rice farming of farmer who owned and who rented the land. Rice-fish culture with 100% chemical fertilizer application gave the highest return (8,764.75 baht/rai). The return decreased when the chemical fertilizer application rate decreased. Rice culture without fish gave the return 4,959.44 baht /rai. The production cost of rice culture without fish was the lowest (3,025.21 baht/rai) and tended to increase when the chemical fertilizer application rate increased. The cost-benefit analysis calculated in 10 years at 12% of discount rate indicated that all treatments provided a profit. The profit from rice-fish culture with 100% chemical fertilizer application was the highest (38,161.13 baht/rai of NPV, 1.63 times B/C ratio and 36.43% of IRR). The profit decreased when the chemical fertilizer application decreased. The profit of rice-fish culture under 25% chemical fertilizer application was the lowest (8,488.60 baht/rai of NPV, 1.15 times of B/C ratio and 33.83% of IRR). The profit from rice culture without fish was in the same range as the profit from rice-fish culture with 75% and 50% fertilizer application. When the production factors changed, the profit of rice culture without fish and rice-fish culture under 50 and 25% chemical fertilizer application tended to decrease dramatically to nonprofit, While the profit of rice-fish culture under 100 and 75% chemical fertilizer application changed but still profitable. The economic analysis indicated that the chemical fertilizer application could be reduced by 25% (or 75% of normal rate) in rice-fish culture and still, the profit was higher than rice culture without fish.