

CHAPTER 8

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

8.1 Summary and conclusions

Due to the renovation policy together with advances in science and technology in agriculture, rice production rose to 57 percent during the period 1985-1999 or 4.6 percent per year. Although rice production in Vietnam obtained the impressive growth over recent years, yet it still struggles with lower yield than those of its counterparts in the region like China and Indonesia. The main objective of this study is to estimate production function, technical efficiency, and factors influencing efficiency of both conventional and hybrid rice production.

The primary data were collected in two representative districts belonging to Hatay province, located in the second biggest rice producing area of Vietnam. 100 farm households were randomly selected to get information about rice production in 2002. Meanwhile, the secondary data were obtained from Agricultural Office of Hatay province, Agricultural Offices and Extension Offices, and other relevant documents.

In order to achieve objectives of the study, the descriptive and quantitative methods were used as the tool of data analysis. The descriptive method aimed to analyze the basic indicators such as mean, standard deviation, minimum, maximum, coefficient of variation, and percentage. The quantitative method (stochastic frontier approach) was used to simultaneously estimate Cobb-Douglas production function frontiers and technical inefficiency equations of hybrid rice and conventional rice under the support of FRONTIER 4.1 software.

The study site, Hatay province, is dominated by rice production. The annual crop sown to rice was 168,264, 167,745 and 168,810 hectares in 1995, 1998 and 2000, respectively and its share was about 79 percent of total annual crop sown area.

On the average, farm household had 5 people and the household head was 46 years old with about 7 year in school. Furthermore, farmers have used conventional rice (Khang Dan variety) and hybrid rice (Bui Tap Son Thanh variety) for 7 and 4 years, respectively. In other words, farmers had longer experience of conventional rice production than hybrid rice production, because hybrid rice has been introduced in Vietnam since 1991. There was no landless farmer, but the average farm size was very small. Rice land area was 0.18 ha/household, with 3 to 5 plots.

In production process, all farmers had signed contract with local agricultural cooperatives for land preparation. Irrigation service was provided by the cooperative's irrigation systems. In addition, all farmers used manure, nitrogen, phosphorus, potassium, and pesticide for rice production.

On the average, the amounts of nitrogen, phosphorus, and potassium use for hybrid rice was higher than those for conventional rice, due to the higher nutrient requirement of hybrid rice variety. In addition, the amounts of nitrogen and phosphorus applied to spring conventional rice was higher than that of summer conventional rice.

Since Hatay province is densely populated, labor used for rice production was intensive. Labor spent on rice farming activities was 218 man-days/ha, ranging from 189 to 253 man-days/ha. The variation in labor use was small (14 man-days/ha).

Given the same season, the yield of hybrid rice (5,307 kg/ha) was higher than that of spring conventional rice (4,976 kg/ha). Furthermore, given the same conventional rice variety, the spring conventional rice obtained higher yield than the summer conventional rice yield (4,413 kg/ha). In addition, the variations in yields of hybrid rice, spring conventional rice, and summer conventional rice among the farm households were approximately 505 kg/ha, 366 kg/ha, and 362/ha, respectively. The variation of yield in hybrid rice was higher than those of spring conventional rice and summer conventional rice. This can be explained that farmers had more experience in

conventional rice production than hybrid rice production. Nevertheless, hybrid rice yield of the study site was lower than those of other adjacent provinces.

With regard to economic return, the budgeting analysis was done. The net return from spring rice production was the highest (1,634 thousand VND/ha), followed by hybrid rice production (1,590 thousand VND/ha) and summer conventional rice production (729 thousand VND/ha). Rice producers could be run in loss if they completely use hired labor instead of family labor. In addition, low rice price also led to lower profit from rice production. Rice price has been stable, but low in recent years. This is regarded as one of the constraints to rice producers.

The result of estimated production frontier of hybrid rice shows that manure, labor and seed were not statistically significant variables. On the contrary, nitrogen, phosphorus, potassium, pesticide, and location variables led to variation in hybrid rice yield. The use of nitrogen negatively affected hybrid rice yield, due to either excessive use of nitrogen or application of nitrogen in inappropriate time. In addition, hybrid rice yield was negatively affected by the pesticide application, because of negative consequences of excessive use of nitrogen and excessive use of pesticide (pesticide application before pest occurred and after pest was observed). However, the levels of phosphorus and potassium application positively affected hybrid rice yield.

Furthermore, manure, seed, potassium, and labor were insignificant variables in the estimated production frontier for conventional rice. The important variables explaining the variation in conventional rice were nitrogen, phosphorus, pesticide, location, and season variables. The application levels of nitrogen and pesticide negatively affected conventional rice yield. Conversely, the amount of phosphorus application was positively correlated to hybrid rice yield.

It was found that, experience, age of household head, access to technical information were very important factors causing the variation in the technical inefficiency of hybrid rice production. For conventional rice production, the effects of these factors were the same, except age of household head.

The coefficient of land size variable had positive and negative sign in technical inefficiency equations of hybrid rice and conventional rice, respectively. However they were statistically insignificant. These might be due to land fragmentation with a small area per plot. Therefore, the economy of land size did not exist.

The means of technical efficiency of hybrid rice production and conventional rice production were 0.87 and 0.85, respectively. This implies that technical efficiencies of hybrid rice and conventional rice are still possible to increase by 13 and 15 percent, respectively. Farmers could increase rice yield by making better use the existing technology.

Evaluation of allocative efficiency was also done to get better recommendation of this study. It indicated that farmers did not achieve the allocative efficiency of any input use. The increase in nitrogen and pesticide expenses reduced the marginal value product (MVP) of both hybrid rice and conventional rice. The increase in phosphorus expense reduced its MVP in hybrid rice, but increased its MVP in conventional rice. Moreover, the MVP of both hybrid rice and conventional rice increased as the expense on potassium increased.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright © by Chiang Mai University
All rights reserved

8.2. Recommendations

Given the foregoing findings, several recommendations are made as follows:

Overall, the level of application of fertilizers and pesticide affected rice yield. On the average, inappropriate levels of fertilizer and pesticide application caused the allocative inefficiencies of these input use. Therefore, the improvement on application levels of fertilizers and pesticide could be considered as the solution to increase rice yield and to obtain allocative efficiency of these input use.

In order to achieve higher rice yield and allocative efficiency, farmers should reduce the level of application of nitrogen but increase the level of application of potassium for both hybrid rice and conventional rice. The application level of phosphorus for hybrid rice should be reduced, while that for conventional rice should be increased.

Inappropriate spraying of pesticide led to the allocative inefficiency of pesticide use and low rice yield. Farmers are recommended to reduce pesticide dose and only use pesticide when it is necessary to obtain allocative efficiency and higher rice yield.

Education and technical information were crucial factors influencing on technical efficiency of rice production. The Government should strengthen and facilitate easy access to the education and extension systems. By doing so, the technical efficiency of rice production could be improved.

Given the existing technologies (hybrid rice variety and conventional rice variety), this study was analyzed with regard to market prices of inputs and output for the cropping season 2002. For this reason, local officers should pay attention to making recommendations for levels of input application in relation to changes in market price of production inputs and rice.