

CHAPTER VII

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1. Summary

The present study centered on examining the possibility of expanding Khao Dawk Mali, a high quality fragrant non-glutinous variety, in Chiang Mai province, as well as the estimation of the input demand and output supply elasticities for rice jointly determined with the choice of rice seed varieties at the farm-level. In other words, it focusses on estimating demand relationships by considering that farmers can response to price changes not only by manipulating their variable inputs alone, but also by moving along a meta-response surface, which is an envelope containing the production surfaces of all potential seed varieties. Normalized restricted translog profit functions for both Khao Dawk Mali and glutinous varieties were estimated utilizing the Two-Stage Switching Regression procedure.

The plot-level crop production data for the wet season, crop year 1992, were collected using multi-stage sampling from six districts of Chiang Mai province (San Kam Phaeng, San Sai, Doi Saket, Phrao, San Pa Tong, and Mae Rim) where either Khao Dawk Mali or the glutinous varieties are predominantly cultivated.

Rice-soybean, rice-garlic, rice-onion, and rice-potatoes were the main cropping systems of the sample farms. Average owned land is 9.20 rai and operation size is 12.79 rai. About half of the farms were owner operated and 20 percent were landless tenants farming under varied tenurial arrangements.

Yield of Khao Dawk Mali (643 kg per rai) was found to be significantly higher than the glutinous varieties (600 kg per rai). Significant differences in the family and exchange labor allocation and hence the total labor use, and family supplied material inputs were also observed between Khao Dawk Mali and glutinous varieties.

Though on the whole no differences were observed in total variable costs, significantly higher profits (gross margin) and returns to family resources per rai were estimated for Khao Dawk Mali production (1,735 and 1,857 baht, respectively) revealing a clear advantage over glutinous varieties (1,111 and 1,242 baht, respectively) when only economics of rice production is considered. Sixty percent higher average labor productivity, measured as value added per day of labor, were also estimated for Khao Dawk Mali (222 baht per day) production as compared to glutinous varieties (133 baht per day).

High price and profit motive were reported as the major influencing factor for farmers to choose Khao Dawk Mali (ranked one) while glutinous varieties were produced for consumption alone (ranked one) followed by profit motive (ranked two). However, about 70 percent of the Khao Dawk Mali growers reported various

problems, mainly insect and disease attacks, as compared to 43 percent glutinous variety growers, revealing high profit is also associated with increased risk of yield.

Almost all farmers sell some or all of their rice crops of which majority (67 percent) sell their rice crop at the farmgate to the middlemen. About 43 percent of the farmers reported some problems in marketing, mainly lack of bargaining power, implying less bottlenecks in the marketing system of rice, except price fluctuations.

Fifty-five percent of the farmers seem to be satisfied at their present level of fertilizer application rate of 17.12 kg and 16.32 kg of material per rai for Khao Dawk Mali and glutinous varieties, respectively, while the rest feels that they should apply more in order to raise the productivity. Some farmers expressed concerns about increasing toxicity in soils as a consequence of increased use of fertilizer for higher production. Most farmers from rice-soybean system reported improvement in soil fertility from soybean residues and hence use less fertilizer. Collective purchase is a common feature in the input markets, particularly fertilizer, which helps in cutting the transportation costs.

About 60 percent of the sample farmers are in debt, where BAAC is the major source of lending. The average level of indebtedness of owner operators (14,270 baht per farm) was estimated at 70 percent higher than the tenant farms (8,196 baht per farm).

Agricultural extension officials were the main sources of technological information (ranked one) while co-farmers and neighbors were the next (ranked two). The role of mass media seems to be minimum in information dissemination (ranked three).

Estimation results of the elasticities of probability of planting Khao Dawk Mali from the first stage probit model revealed that seed selection is quite responsive to the fertilizer/rice price ratio as well as labor/rice price ratio. The positive elasticity of probability with respect to land area suggests that plot size is positively related with Khao Dawk Mali adoption.

The second stage estimation of the normalized restricted translog profit function jointly estimated with three factor share equations using Seemingly Unrelated Regression Estimator method revealed that there were significant selectivity bias in estimating equations from a subsample of cultivators in Khao Dawk Mali regime, supporting the hypothesis of the study.

All the own-price elasticities were estimated to be inelastic. The total own-price elasticity of demand after allowing for the seed switching adjustments for fertilizer, labor and tractor power were estimated at -0.81, -0.69 and -0.37, respectively. The impact of seed switching adjustments were about 9, 40 and 17 percent for fertilizer, labor, and tractor power, respectively. This indicates, that allowance of farmers to move along the meta-response surface increased the opportunity of the farmers to raise income from rice production.

All variable inputs were found to be complements, rather than substitutes, because all the cross-price elasticities were negative. The output supply elasticity was estimated at 0.31 indicating a moderate response to output price changes. The output supply with respect to land area and value of fixed farm assets were 0.90 and 0.04 respectively. This indicates that, one percent change in land area will increase output supply by 0.90 percent and one percent improvement in the value of fixed capital will increase output supply by 0.04 percent.

A 10 percent reduction in tractor power price is suggested from the ranking of fifteen policy alternatives according to their cost-effectiveness for the Chiang Mai province calculated on a per rai basis. A 22 baht per rai subsidy for this policy will yield a net benefit of 26 baht per rai to farmer and 4 baht per rai to the country. The rate of return being 18.7 percent. On the other hand, a 10 percent increase in rice price would require a subsidy of 235 baht per rai and will give a substantially higher net benefit of 274 baht per rai to farmer and 39 baht per rai to the country. The yield rate on this output subsidy is 16.7 percent (ranked two). For the combined policy alternatives, tractor power price and rice price subsidy would yield a return of 300 baht per rai to farmers and 42 baht per rai or 16.2 percent to the country (ranked three).

7.2 Conclusion and Recommendation

Thailand being a food surplus country, faces a different set of food policy issues than other developing countries. Food, is the major source of export earnings

in Thailand. For several decades Thailand has been a major world exporter of rice. However, in recent times, Thailand is facing high competition in the already thin world rice market owing to its increasing labor wage and production costs. It is worth noting that, Thailand enjoys a duopolistic competition in the high quality rice market with United States as the sole opponent. In 1992, an additional environmental limitation, that is, shortage of water for dry season rice (which is mainly grown for exports), is posing threat to the future of low quality rice exports. Therefore, exploring the possibilities of expanding high quality rice production seemed urgent. Khao Dawk Mali, a non-glutinous fragrant traditional variety, is considered as the top quality rice of Thailand and has a high demand in export markets as well.

The current results revealed that Khao Dawk Mali production demonstrated clear advantage over glutinous varieties when only economics of production is considered. With significantly higher yield, better price incentives and no differences in total variable costs, Khao Dawk Mali production accrued significantly higher profit over the glutinous varieties. The higher average labor productivity, measured as value added per day of labor, was also a positive factor in consideration. However, higher return is not devoid of risk. Higher incidence of insect and disease attacks in Khao Dawk Mali may hinder its rapid expansion in these major growing areas that was observed throughout the past 10 years. It is worth mentioning that, the observations for the present study were drawn mainly from areas not damaged by the widespread disease outbreak that occurred in this region during the crop year 1992, though a few farmers reported some damage.

The bio-physical environment in the study areas appeared to be suitable for growing either varieties, thereby, offering more flexibility in switching varieties for farmers. In fact, in San Sai, Doi Saket and Phrao, Khao Dawk Mali has been grown in conjunction with glutinous varieties for many years. Therefore, in areas with inadequate irrigation and water control, expansion of Khao Dawk Mali can be considered because of its tolerance to drought conditions and relative economic advantage.

Based on the implications drawn from the economic and qualitative analyses and subject to the given condition of higher and more price certainty and favorable move towards increased consumption demand for high quality rice, it can be concluded that, Khao Dawk Mali offers a better alternative cash crop for the rice farmers in Chiang Mai province. However, a number of caveats are in order. Firstly, the disease susceptibility of Khao Dawk Mali should be given due consideration. Secondly, major concern lies in the acceptance of the quality standards of Khao Dawk Mali by the exporters. Finally, in order to balance between the consumption and higher income priorities, farmers could partly allocate their land to glutinous rice for consumption and partly to Khao Dawk Mali for the market.

For policy prescription purposes, cost-effectiveness analysis was performed to determine the effect of fifteen alternative policy instruments calculated on the basis of responses predicted by the estimated elasticities. From the viewpoint of both the cost-effectiveness and distributional considerations for the target beneficiaries, the rice farmers, it can be concluded that, price policies for raising rice yields and

farm incomes in Chiang Mai province should focus on rice prices and tractor power prices.

From the above conclusions, it is hoped that these findings could provide some valuable inputs for a more detailed understanding of the farm-level production structure and dynamics of farmers actions and responses to variable input price changes in Chiang Mai province. However, policy makers should be cautioned that the results obtained in this study are a function of a sample of data. Therefore, the use of these results for a changed environment should be undertaken with caution. Moreover, in order to utilize the results and implications of this study, the following research limitation worth consideration.

Due to some logistic limitations, the scope of the study could not be expanded to northeastern region where Khao Dawk Mali is predominantly grown, which would have enabled us to draw policy recommendations for a larger area or the country as a whole.

7.3 Further Areas of Research

Controversies exists in determining the quality of the Khao Dawk Mali produced in northern Thailand for exports and hence its acceptance by the exporters. For drawing a conclusive policy implication on the potential of expansion of Khao Dawk Mali, a clear understanding of the marketing aspects and quality control is

desirable, which is however, beyond the scope of this study. Therefore, studies on marketing, quality as well as productivity of Khao Dawk Mali should be undertaken.

Moreover, as there are large differences in agro-climatic situation of northern region with the rest of the country, similar studies might be undertaken covering the greater north, northeast and central region to check magnitudes of the parameters and hence the farmers' response patterns.

With respect to methodology, qualitative variables such as marketing aspects, education, agricultural extension, drought and disease resistance of the varieties, etc., which can also be considered as important determinants of seed variety choice can be incorporated in the probit reduced-form seed selection equation for a possible better estimate. However, it should be noted that, the corresponding profit functions for the second stage estimation has to be respecified accordingly.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

Copyright© by Chiang Mai University

All rights reserved