

CHAPTER IV

DECISION MAKING AND CHOICE OF RICE VARIETIES

Decision making process is a complicated issue, dealing with which calls for substantial evidences to support the notions. In general, qualitative techniques, such as preference rankings, farmers' own perceptions and attitudes etc. facilitate our understanding of the decision making process. However, qualitative analysis alone cannot be considered as complete. Econometric techniques, on the other hand, reconfirms conclusions and enable us to predict on the farmers' responses, hence, their decision making with respect to economic variables through testing various hypotheses developed from *a priori* knowledge of the situation. Therefore, one strategy to analyze the issues is to use a combination of qualitative and quantitative methods. The present chapter attempted to highlight some qualitative features associated with the production and marketing of Khao Dawk Mali and glutinous varieties while the next chapter is devoted to quantitative analysis of the decision making process at the farm-level.

4.1 Factors Influencing Variety Selection Decision

Respondents were asked to rank among seven selected factors believed to influence the rice variety selection decision. The factors selected for questions were obtained from the questionnaire pre-test session conducted at Fang district in the

upper northern Chiang Mai. These are, *high price and profit motive, ready market for the output, low cost of production, resistance to drought, short maturity period of the crop* (this might have implication on choice of second crop after wet rice), *resistance to insect and disease attack* (which have direct effect on profitability as well as food security), and *producing for consumption*. For analysis, respondents were grouped into three, those who grew only Khao Dawk Mali, those who grew only glutinous variety, and those who grew both. This was done in order to identify whether a variation in perception on these varieties exists between categories of growers.

Table 11 presents the farmers' ranking of the factors influencing variety selection decision. It was noted that, the single variety growers ranked only for the varieties they grew, and skipped answer for other varieties. High price and higher profits came up as the major influencing factor to chose Khao Dawk Mali, while ready marketability of the product is ranked second. It was believed that Khao Dawk Mali is a drought resistance variety and as such can be grown in relatively dry areas. The respondents also ranked drought resistance between third and fourth across categories of growers.

Glutinous varieties are grown mainly for consumption. However, profit motive of growing this variety was ranked second and resistance to disease and insect attack ranked third. The ranks for other factors are mixed among categories of growers.

Table 11. Ranking of factors influencing farmers' rice variety choice

Factors	Only KDML rice growers		Only glutinous rice growers		Both			
	Percentage of farmers responding according to rank		Percentage of farmers respon- ding according to rank		Percentage of farmers responding according to rank			
	(%)	Rank	(%)	Rank	for KDML		for glutinous	
				(%)	Rank	(%)	Rank	
High price and profit	89.74	1	39.89	2	80.00	1	29.52	2
Ready market	46.15	2	38.89	5	41.90	2	28.57	6
Low cost of production	30.77	5	44.44	4	41.90	6	27.62	7
Drought resistance	23.08	3	33.33	6	31.43	4	40.00	4
Short maturity	38.46	4	-	-	35.23	5	30.47	5
Disease resistance	25.64	6	47.22	3	18.09	3	29.52	3
For consumption	-	-	77.78	1	-	-	63.81	1
Multiple responses	n = 39		n = 36		n = 105			

Note: These percentages are computed on the basis of the number of times that a given factor was chosen for a corresponding rank across respondents

Source: Survey

4.2 Incidence of Changing Rice Varieties

The present study was intended to identify whether farmers response to prices by adjusting their variable inputs as well as switching seed varieties for a more optimal adjustment. One qualitative investigation would be to enquire whether the farmers had changed seed varieties over the production period of about 10 years. Fifty five percent of the farmers' were found to change varieties for at least one or more times over the past decade (Table 12).

Table 12. Farmers responses on changing varieties as well as sources for procuring seed in the past five years

Area	Percentage of farmers responding (%)			Percentage of farmers responding (%)		
	Changed variety	Did not change variety	Total	Changed seed source	Did not charge seed source	Total
San Kam Phaeng	54.55	45.45	100.00	59.09	40.91	100.00
Doi Saket	47.22	52.78	100.00	38.89	61.11	100.00
Phrao	35.71	64.29	100.00	45.24	54.76	100.00
Mae Rim	77.27	22.73	100.00	45.45	54.55	100.00
San Sai	58.66	41.94	100.00	35.48	64.52	100.00
San Pa Tong	74.08	25.92	100.00	33.33	66.67	100.00
All area	55.00	45.00	100.00	42.22	57.78	100.00

Source : Survey

The major direction of changes were from local varieties to Khao Dawk Mali and glutinous varieties to Khao Dawk Mali. Changes were also made from local varieties to glutinous varieties as well as among different glutinous varieties, such as RD 6, RD 8, RD 10, Neaw San Pa Tong (Table 13).

Enquiry on farmers' practices on recycling the seed source was also made. Changing seed source here refers to changing the supply source of the seed to be used, such as supplying from own production for three consecutive years and then using purchased seeds from the market. The rationale for changing source is that using the same source of seed depresses the corresponding yield levels and some 42 percent farmers' were found to be aware of this fact and reported that they use to recycle the seed source at least once in five years or every year (Table 12).

Table 13. Percentage distribution of changes in variety in the past five years, 1987 to 1992.

Changed from	Changed to			Row total
	Khao Dawk Mali	Glutinous varieties	Local varieties	
Khao Dawk Mali	-	100	-	100
Glutinous varieties	66	34	-	100
Local varieties	62	35	3	100
Total	60	39	1	100

Source: Survey

Problems encountered in Khao Dawk Mali production was found to be higher than glutinous variety production. Major problems reported was insect and disease attacks, and a combination of insect and disease attacks with lack of water for irrigation and sterility in seeds (Table 14). The response pattern for glutinous varieties were also similar but to a lesser extent.

Table 14. Farmers' responses on types of problems encountered in rice production

Problem categories	Percentage of farmers responding (%)	
	Khao Dawk Mali	Glutinous rice
Insect and disease attacks	27.22	18.33
Insect, disease and lack of water	9.44	7.78
Sterile seed and low production	4.44	5.56
Low and fluctuating price	8.33	3.33
Insect, disease and sterile seed	7.22	2.77
Insect, disease and fluctuating price	11.67	4.44
No problem	31.68	57.79
Total	100.00 n = 180	100.00 n = 180

Source: Survey

4.3 Rice Marketing Practices and Constraints

Apart from the national highway, a well developed feeder road network accessible in all seasons to every village provide adequate access for the farmers to the market for buying and selling operations. Rice marketing system is also facilitated by presence of middlemen who purchases the output at the farmgate and also acts as information dissemination sources for the farmers in some cases.

In the study areas, almost all (94.4 percent) farmers use to sell some or most of their rice crop (Table 15). Majority of them (65.88 percent) sell their paddy at the farmgate to the middlemen, which saves the costs of carrying and transportation to markets. As San Pa Tong hosts a large rice mill and also have favorable proximity to city market, about 96 percent of the farmers sell their paddy at the market (66.67 percent) and rice mill (29.16 percent) which is very different from the other areas. Since the middlemen purchase the products, the marketing costs are also borne by them (67 percent cases).

The average marketing costs (transportation, food, rental charges and carrying costs) was estimated at 124 baht per ton of paddy in cases where the farmer undertakes the marketing operations. This estimate should be taken with caution as the incidence of marketing by farmers themselves is quite small, and the volume marketed is also not very substantial. However, as an indication, this estimate suffice to the need.

Table 15. Rice marketing practices and the average marketing cost of the sample farms

Area	Percentage of farmers selling rice (%)	% of farmers selling at			Who pays for marketing costs (%)		Average marketing cost per ton of paddy sale (baht/ton)
		Farm-gate	Rice-mill	Market	Farmer	Middlemen	
San Kam Phaeng	90.91	70.00	10.00	20.00	20.00	80.00	96.61
Doi Saket	100.00	97.22	2.78	-	11.11	88.89	204.56
Phrao	95.24	57.50	17.50	25.00	35.00	65.00	134.65
Mae Rim	86.36	78.94	10.53	10.53	10.53	89.47	100.00
San Sai	100.00	70.97	12.90	16.13	32.25	67.74	78.71
San Pa Tong	88.89	4.17	29.16	66.67	91.67	8.33	130.29
All area	94.44	65.88	13.53	20.59	32.94	67.06	124.14

Source: Survey

An open question was placed to the farmers to react on any problems encountered in the marketing process. Low output price and lack of bargaining power was the main problem of the farmers (21 percent) in these areas (Table 16). However, 58 percent of the farmers seems to be quite satisfied with the existing marketing systems, as they felt there were no problem. Cheating in measurement was another problem, so was the low quality of rice (i.e., high moisture level, low grain weight, sterile grain etc.).

Table 16. Farmers responses on types of problems encountered in rice marketing

Problem categories	Percentage of farmers responding (%)						
	San Kam Phaeng	Doi Saket	Phrao	Mae Rim	San Sai	San Pa Tong	All area
Bargain in price	22.74	25.00	11.90	13.64	32.26	22.22	21.11
Cheating in measurement	13.64	2.78	9.53	4.54	3.23	11.11	7.78
Low quality of rice	9.09	2.78	7.14	4.54	3.23	11.11	6.11
Bargain in price and low quality	4.54	5.55	9.53	4.54	12.90	3.70	7.22
No problem	49.99	63.89	61.90	59.10	48.38	51.86	57.78
Total	100.00 n = 22	100.00 n = 36	100.00 n = 42	100.00 n = 22	100.00 n = 31	100.00 n = 27	100.00 n = 180

Source: Survey

4.4 Farmers' Perception on Input Use

Manipulation of the levels of variable inputs in response to price changes leads to the economic optimization. Fertilizer is one of the major input that contributes to increased productivity for fertilizer responsive varieties coupled with adequate water control. Therefore, knowledge of farmers' perception on the use levels of this particular input as well as purchasing practices and problems encountered in input markets seems desirable.

Table 17. Input purchasing practices and perception of the sample farmers on the extent of fertilizer use

Grower category	Percentage of farmers responding (%)					
	Use enough fertilizer	Do not use enough fert.	Total	Buy inputs collectively	Do not buy collectively	Total
Only Khao Dawk Mali growers (n = 39)	56.41	43.59	100.00	48.72	51.28	100.00
Only glutinous rice growers (n = 36)	61.11	38.89	100.00	47.72	52.78	100.00
Both variety growers (n = 105)	51.43	48.57	100.00	44.76	55.24	100.00
Total (n = 180)	54.44	45.56	100.00	46.11	53.89	100.00

Source: Survey

About 54 percent of the farmers perceive that their present fertilizer application rate (17.12 kg and 16.32 kg of material per rai for Khao Dawk Mali and glutinous variety at the sample means, respectively) is sufficient (Table 17). The rest 46 percent considers the present rate to be not enough. The reasons cited by the both groups as a whole were, consequent increase in the cost of production at higher level of use, fear of increasing toxicity to the soil, positive residual affects from previous soybean crop (under rice-soybean system), use of manures, rice straw and soybean by-product for mulching. It was found that 21 percent of the farmers used manures and majority of the farms used straw and other residues in addition to fertilizer for mulch. Only, less than five percent of the farms did not use fertilizers.

About 46 percent of the farmers use to purchase fertilizer and other inputs collectively (Table 17). The main reasons cited were, cheaper transportation costs, and membership obligation in agricultural groups. As more purchases were made in the cooperatives, the farmers ultimately reap the benefits of higher dividend at the year-end.

4.5 Farm Indebtedness

Sixty percent of the farmers are in debt (Table 18). Institutional source, particularly the Bank of Agriculture and Agricultural Cooperatives (BAAC), was the major source of loan. Only 6.11 percent of borrowers borrowed from non-institutional sources. Incidence of being indebted to both sources were negligible (about 1 percent). Between category of growers, about half of the Khao Dawk Mali growers are in debt as compared to 64 percent in the remaining two categories. Across tenancy status, no large difference in indebtedness of farms was observed. Distribution across areas reveals that, about 87 percent of farmers in San Kam Phaeng (nearest to the city centre) are indebted followed by 74 percent in Phrao (farthest from the city centre with inadequate infrastructure and low productivity).

Table 18. Percentage distribution of farmers who were indebted in crop year, 1992

Variety/ Area/ Tenancy	Non- indebted (%)	Indebted to institutional lenders (%)	Indebted to non-institu- tional lenders (%)	Total
<u>By variety</u>				
Only KDML growers	51.28	41.03	7.69	100.00
Only glut. growers	36.11	55.56	8.33	100.00
Both	36.19	57.14	6.67	100.00
<u>By tenancy status</u>				
Owner operators	43.01	52.69	4.30	100.00
Tenants	37.93	54.02	8.05	100.00
<u>By area</u>				
San Kam Phaeng	13.64	68.18	18.18	100.00
Doi Saket	55.55	38.89	5.58	100.00
Phrao	26.19	64.29	9.52	100.00
Mae Rim	40.91	50.00	9.09	100.00
San Sai	61.29	38.71	-	100.00
San Pa Tong	33.33	66.67	-	100.00
All Area	39.44	54.45	6.11	100.00

Source : Survey

The mean level of indebtedness was estimated at 11,336 baht per farm of which 95 percent (10,793 baht) was from institutional source (Table 19). However, when tenancy status was considered, the discrepancy in amount indebted was found to be very large. The average level of indebtedness of owner operators (14,270 baht per farm) was 74 percent higher than the tenant operators (8,196 baht per farm). This might be because of the opportunity to provide more collateral by the owner operators as compared to the tenants.

Table 19. Average level of indebtedness of rice farms by area and tenancy

Area/Tenancy	Institutional source (baht/farm)	Non-institutional source (baht/farm)	Total (baht/farm)
<u>San Kam Phaeng</u>	15,664	1,792	17,456
Owner operated	18,940	1,828	20,768
Tenant operated ^a	8,644	1,714	10,358
<u>Doi Saket</u>	6,722	209	6,931
Owner operated	9,250	-	9,250
Tenant operated	3,563	471	4,034
<u>Phrao</u>	12,833	1,119	13,952
Owner operated	19,778	-	19,778
Tenant operated	7,625	1,958	9,583
<u>Mae Rim</u>	10,250	164	10,414
Owner operated	12,269	46	12,315
Tenant operated	7,333	334	7,667
<u>San Sai</u>	7,258	-	7,258
Owner operated	10,357	-	10,357
Tenant operated	4,706	-	4,706
<u>San Pa Tong</u>	13,576	-	13,576
Owner operated	13,042	-	13,042
Tenant operated	14,071	-	14,071
<u>All area</u>	10,793	542	11,314
Owner operated	13,969	301	14,720
Tenant operated	7,397	799	8,196

^a Tenant includes both pure tenant and part tenant operators.

Source: Survey

However, the pattern of indebtedness is largely a reflection of the characteristics of the rice farmers drawn in the sample and may not necessarily be

as a consequence of growing glutinous rice or Khao Dawk Mali rice.

4.6 Incidence of Extension Support

Factors such as education and agricultural extension are considered as important determinants of seed variety choice (Pitt, 1983). Investigation was made in order to understand the farmers' perception on various technology and relative contribution of technological information from different sources. As such, farmers were asked to rank between three selected sources of information and the type of information received from them. The sources are, co-farmer, agricultural extension officials (both at district and subdistrict levels) and mass media. These selections were made from the result of questionnaire pre-test sessions. Enquiry was also made on whether the farmer received any agricultural training over the past periods (as long as he/she can recall) and, if any, the types and duration of them.

Table 20 presents the ranking of the technological information sources by the farmers. As a whole, agricultural extension officials were ranked as the most important source of technological information, such as fertilizer use, choice of seed varieties, planting methods, weed and water control, land management, and general agriculture other than rice. For insect and disease control measures, co-farmers or neighbors were ranked first followed by the agricultural extension officials. It was interesting to note that, the mass media played a very rudimentary role in technological information dissemination except for providing the prices and market information of various crops (ranked first) and some general agricultural news (ranked second).

Table 20. Ranking of the sources for technological information received

Type of technology	Co-farmer		Kaset official		Mass media		n
	Percentage of farmers responding according to rank (%)	Rank	Percentage of farmers responding according to rank (%)	Rank	Percentage of farmers responding according to rank (%)	Rank	
Insect and disease control	19.86	1	33.56	2	46.58	3	n = 146
Fertilizer Use	40.84	2	32.39	1	26.77	3	n = 71
Rice Variety	37.25	2	29.41	1	33.34	3	n = 51
Planting method, land, water and weed management	41.07	2	28.57	1	30.36	3	n = 103
Price and market information	53.85	2	-	-	46.15	1	n = 13
General agriculture	29.63	3	15.79	1	50.53	2	n = 95

Note: These percentages are computed on the basis of the number of times that a given factor was chosen for a corresponding rank across respondents

Source: Survey

Majority of the farmers did not receive any training (Table 21). Only 17 percent farmers received some training on planting techniques and input usage in rice production and fisheries development ranging from one to three days duration conducted by relevant government agencies.

Table 21. Incidence of training in agricultural production technology of sample farms

Option	San Kam Phaeng	Doi Saket	Phrao Rim	Mae Sai	San Tong	San Pa	All area
Received training (%)	18.18	13.89	16.67	18.18	16.13	18.52	16.67
Did not receive training (%)	81.82	86.11	83.33	81.82	83.87	81.48	83.33
Total	100.00 n = 22	100.00 n = 36	100.00 n = 42	100.00 n = 22	100.00 n = 31	100.00 n = 27	100.00 n = 180

Source: Survey

About 78 percent of the farmers had affiliation in at least one social organization (Table 22). The majority (57.44 percent) were the members of the BAAC, from where they borrowed credit and purchased fertilizer and other chemicals.

Table 22. Membership in social organizations

Area	Percentage of farmers (%)		Membership in (% of all members)		
	Having membership	Not having membership	BAAC	Agricultural cooperatives	Agril. Group and others
San Kam Phaeng	77.27	22.73	82.35	11.76	41.18
Doi Saket	80.56	19.44	41.67	33.33	8.33
Phrao	85.71	14.29	66.67	19.44	33.33
Mae Rim	59.09	40.91	76.92	23.08	-
San Sai	67.74	32.25	47.62	42.86	9.52
San Pa Tong	92.59	7.41	32.00	52.00	16.00
All area	78.33	21.67	57.44	32.62	26.95

Source : Survey

4.7 Highlights

From the ranking of factors influencing rice variety selection decision, high price and profit motive were reported as the main influencing factor for farmers to chose Khao Dawk Mali (ranked one) while glutinous variety is mainly produced for consumption (ranked one) followed by profit motive (ranked two). Over the past five years, the main direction in seed switching were directed to Khao Dawk Mali from other varieties.

Majority of the Khao Dawk Mali growers (70 percent) reported problems in production, mainly, insect and disease attack as compared to glutinous variety growers (43 percent). Almost all farmers sell some or all their rice crops, msajority (67 percent) selling them at the farmgate.

Fifty-five percent of the farmers reported that their present level of fertilizer application is satisfactory (17.12 kg and 16.32 kg for Khao Dawk Mali and glutinous variety, respectively). About 60 percent of the farmers are in debt. 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).

From the ranking of main source of technological information, agricultural officials were ranked one followed by co-farmer and mass media ranked two and three, respectively.