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Ex ante assessment on feasibility of Maswangi (MRQ 74) commercialization

[Penilaian *ex ante* terhadap kebolehlaksanaan pengkomersialan Maswangi (MRQ 74)]

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Keywords: ex ante, feasibility study, Maswangi MRQ 74, rice

Abstract

Maswangi (MRQ 74) was licensed to the Area Farmers Organization (PPK) in 2005 which allowed them to plant, process, pack and market the rice, with MARDI providing all the technical support and pure seeds to help to promote it through agricultural expositions and shows. This study was to uncover the possible problems and constraints faced in commercializing Maswangi in the domestic market. A suitable profit margin was analysed for retailers, wholesalers, millers and farmers after consumer acceptance of Maswangi was determined. Market segments for Maswangi were mainly Malays from small-sized households. The suggested price was relatively low, approximately RM2.43/kg. Paddy price of RM680/t was suggested as a suitable price to ensure reasonable profit margin for both millers and farmers. Based on this study, it was concluded that Maswangi could be commercialized. Millers will get RM2,954 net profit when processing 150 t paddy and farmers will receive additional RM158/ha. Commercialization of Maswangi will increase the self-sufficiency level (SSL) especially when substituting Ponny and Basmathi rice from Pakistan.

Introduction

BERNAS (2008) estimated that about 20% of the total imported rice was fragrant and basmathi rice (specialty rice). Demand for specialty rice shows an increasing trend. It registered an Average Growth Rate (AGR) of 3.5% during the 2004–2007 period. Maswangi or MRQ 74 is a specialty rice variety officially released by MARDI in February 2005. It possesses special characteristics such as long and slender grain shape, high amylose content, moderate soft gel consistency and moderate alkali spreading value resulting in flaky, non-sticky and aromatic rice which is highly preferred by local consumers (Asfaliza et al. 2008).

Maswangi was licensed to PPK Kangkong, Kelantan and PPK Langkawi, Kedah in 2005. This licensing allows the PPK to plant, process, pack and market the rice while MARDI provides all the technical support and pure seeds to help to promote it through agricultural expositions and shows. Planting activity was contracted out to farmers in Rantau Panjang, Kelantan. PPK Kangkong that operates a rice mill buys paddy from contract farmers and appoints rice traders to market the rice. Presently, PPK Langkawi plants Maswangi on rented land in Kampung Ewa which is under organic cultivation (Othman 2006). Further steps should be taken to penetrate the

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domestic market widely by making the rice competitive and a consumer choice of local high quality rice.

An ex ante study by Qaim (1999) on both virus and weevil resistant sweet potato varieties in Kenya found that yield increased by 18% and 25% respectively with no significant regional differences. An economic surplus model simulation showed that the virus resistant varieties would produce an aggregate annual benefit of USD5.4 million, whereas the weevil resistant technology could create welfare gains of USD9.9 million per year. The total net benefits of adopting insect resistant cotton variety in West Africa seem to be small even after including the innovator surplus which accrued a larger share of the benefits (Falck-Zepeda et al. 2007). The adoption pattern and the length of the adoption period affected the share of benefits earned by producers as compared to that of innovators. Both ex ante studies above can be useful to provide a guidance to conduct this study.

Recently there was a disagreement between farmers and rice miller about the price being offered for the Maswangi. It seemed that the price was similar to that of the normal paddy. On the other hand, miller complained that processing of Maswangi resulted in low graded rice recovery (GRR). Low GRR can contribute to lower profit acquired by millers. A milling test result for GRR by a technology generator gave 67.8% which is quite promising and is higher than that of the normal variety.

This study was to uncover the possible problems and constraints faced in commercializing Maswangi in the domestic market. The study looked into the consumer acceptance of Maswangi and provided a suitable profit margin for each party ranging from farmers to consumers. Suggestions of suitable actions that should be taken to enhance the commercialization level of Maswangi were also illustrated.

Methodology

A survey was carried out on the perceptions and preferences of consumers on Maswangi on visitors to the Malaysia Agriculture, Horticulture and Agrotourism Exhibition (MAHA) 2006. Respondents were provided with a questionnaire and 1 kg of Maswangi for them to experience its quality, and the questionnaire to be returned within a specified period.

Retailers were also surveyed on market positioning of Maswangi among the top rice brands in Malaysia. Comparison was made between normal rice brands and specialty rice brands mainly from Thailand (for fragrant rice), India and Pakistan (for Basmathi rice). Besides that, profit margin was determined among retailers, wholesalers, millers and farmers. Before accepting the profit margin for millers, cash flow analysis was carried out and the breakeven price was determined to ensure millers would still get benefit from the specialty rice production against that of the normal rice. Finally, a partial budgeting analysis was done on farmers to determine whether the new technology (Maswangi) had advantages compared to that of the existing technology (normal rice variety) (*Figure 1*).

Primary data were collected from PPK Kangkong for milling analysis and PPK Rantau Panjang for partial budgeting analysis. PPK Langkawi was not taken into account because Maswangi was planted organically, which was not within the

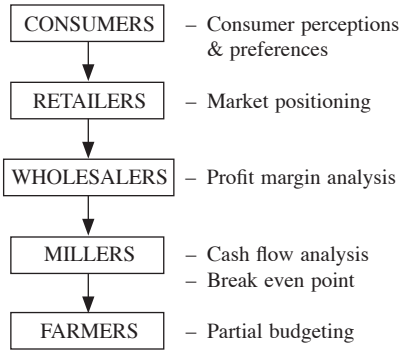

Figure 1. Flowchart of analysis taken and parties involved

scope of the research. Comparison between Maswangi and the normal variety regarding the production cost analysis was done with participating farmers.

According to Kotler and Armstrong (2004), there are three types of general pricing approach: the cost-based approach, the buyer-based approach and the competition-based approach. The buyer-based approach was taken to estimate millers' selling price in this study. This approach sets its target price based on customer perceptions of the product value. Pricing begins with analysing consumer needs and value perceptions, and price is set to match consumers' perceived value which takes into consideration the costs incurred in product development. Thus, a possible price would be generated for each party involved in the planting and marketing of the Maswangi variety.

Secondary data on profit margin for millers, wholesalers and retailers were gathered from the Ministry of Agriculture an Agro-based Industry. The data on rice price in major markets were from personal observations in 2007.

Results and discussion

Consumer perceptions and preferences

There was a good response from Maswangi consumers. About 79% of respondents were willing to shift to Maswangi and a majority of them were normal rice consumers (Syahrin et al. 2008). Market segments for Maswangi were Malays from small-sized households. The suggested price was relatively low, approximately RM2.43/kg. There was a need for the degree of fragrance in Maswangi to be improved based on the consumer needs. The selling points of this rice are the non-stickiness and low starch content. Maswangi can be considered as a substitute for Ponny and Basmathi rice in the market. Respondents also preferred soft, fragrant and long slender grain rice.

Market positioning

High quality rice has a better price than normal rice. Even though market proportion of high quality rice is small, it is increasing every year. Since Maswangi falls under the specialty rice category, its retail price should be higher than that of normal rice. Currently, Maswangi is only sold by agents under the Koperasi Kakitangan MARDI Kelantan for the East Coast region markets, Agro Jernih Sdn. Bhd. for the North region markets, and the Koperasi Kakitangan MARDI (KoMARDI) for the Klang Valley region markets. Recommended selling price printed on the package is RM18.00 for 5 kg which is equivalent to RM3.60/kg.

Profit margin analysis

Analysis on the profit margin for each party needs to be measured when considering commercialization of new product or technology. This is to ensure the commercialization of the technology from farmers to retailers. Normal rice production scenario would be taken as a baseline to determine current profit margin each party would get to produce local rice.

In the current Super Special Tempatan (SST) market structure (Anon. 2004), the retailers' margin is estimated at RM0.15 (7.9%), wholesalers at RM0.35 (20.0%) and the retail price is RM1.90 per kilogramme as practised (*Figure 2*). The low margin per kilogramme is due to the high volume involved in rice trading. Millers get the highest margin to produce local rice at 53.6%, which is acceptable due to the high capital and operating costs required to

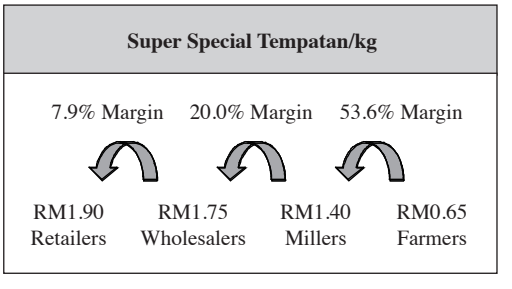

Figure 2. Profit margin in producing SST (Super Special Tempatan)

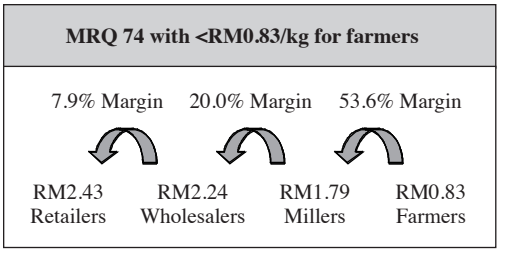

Figure 3. Projected price for Maswangi with RM0.83/kg paddy price

process paddy to rice. This process involves drying, dehusking, milling and packaging.

Based on the price recommended by consumers, which was RM2.43/kg, the margin for each party involved was determined by using the same margin as SST rice produced in a backward estimation with the same profit percentage for all parties. Retailers would obtain RM0.19 and it was RM0.45 for wholesalers. In this case, millers could sell the rice to wholesalers at RM1.79/kg which was RM0.39 higher than that of normal rice (*Figure 3*).

In the market structure for Maswangi, each party receives a higher value compared to producing SST even when using the same profit margin. It is an advantage for retailers, wholesalers, millers and farmers to commercialize Maswangi. However, the final decision cannot be determined as the financial analysis on millers has not been done. This is needed to ensure the crucial part that is, processors/millers will get optimum profit when producing Maswangi.

Millers cash flow analysis and break even price

From 2005 to 2007, Maswangi was processed only three times by single millers except in Langkawi. A total amount of 66.6 t graded rice was sold by the three agents stated earlier from 2005 to 2007 which accounted for 47.3% of the total graded rice produced. Total gross weight and net weight for Maswangi paddy were 413.6 t and 334.6 t respectively. About 17.6% of the gross weight of paddy was made up of impurities, unfilled grain and unwanted moisture. The total graded rice recovery produced was 40.5%, broken rice 18.8%, bran 8.5% and chips 3.33%. The graded rice recovery kept increasing with the best result at 45.2% with 16.8% broken rice, 8.9% bran and 2.3% chips (*Table 1*).

Normal variety graded rice recovery was usually 55–60%, with 9% for bran and only 1% for chips. Two possibilities contribute to the lesser milling performance: variety and millers. Maswangi possibly has high broken rice rate due to low grain width, that is 1.84 mm (MR 219 grain width is 2.01 mm) (Alias et al. 2001).

However, a milling test result by a technology owner showed that milling recovery was 67.8% which was a big difference from the milling result of the PPK Kangkong miller. Low graded rice recovery and high percentage of chips could be due to the poor handling and inefficient machinery used by the PPK Kangkong. This could be

Table 1. Milling result for Maswangi

Season	1/2005	2/2005	1/2006	Average	Total
Paddy					
Gross weight (t)	98.75	146.1	168.74	137.86	413.59
Deduction (%)	16.0	17.2	19.5	17.6	–
Offered weight (t)	82.95	120.99	135.8	113.25	339.74
Net weight (t)	74.65	122.27	137.66	111.53	334.58
Recovery					
Graded rice (%)	31.3	45.1	45.2	40.5	–
Broken rice (%)	22.6	17.3	16.6	18.8	–
Bran (%)	9.3	7.3	8.9	8.5	-
Chips (%)	5.0	2.7	2.3	3.3	–

Source: PPK Kangkong, pers. comm. (2007)

Table 2. Graded rice recovery vs paddy price for Maswangi

Graded rice recovery (%)	Net income/RM150 t				
	Paddy price (RM/t)				
	650	680	697	742	830
40	529.17	–4,470.83	–7,304.17	–14,804.17	–29,470.83
45	7,954.17	2,954.17	120.83	–7,379.17	–22,045.83
50	15,379.17	10,379.17	7,545.83	45.83	–14,620.83
55	22,804.17	17,804.17	14,970.83	7,470.83	–7,195.83

seen from the production of 2.3% chips for PPK Kangkung as compared to the normal 1% of other millers. Lack of technical skills and improper paddy handling in the mills can also lead to poor quality of rice.

It was assumed that fixed cost for millers was RM 95/t and operating cost was RM110/t (Anon. 2004). Other costs including grading incentives estimated at RM70–90/t will depend on paddy price. The price of rice would then be RM1,790/t as previously suggested. If millers produced rice with 45% recovery and RM830/t paddy price, negative cash flow estimated at RM22,045/t would be incurred taking into account fixed cost and operating cost involved in rice milling (*Table 2*). Therefore, paddy price should be adjusted lower for the millers to make some profit.

The breakeven point for millers was at RM697/t for 45% GRR (*Figure 4*). At RM680/t, millers could get RM2,954 profit when processing 150 t paddy for the production of rice. This shows that RM680 paddy price is appropriate to secure millers profit instead of RM830 estimated from the profit margin analysis which was done previously. Therefore, millers should get a minimum margin of 61.1% for their efforts to be profitable, with the paddy price higher than that of the current normal paddy price (*Figure 5*). It should be the best suggested price for each party to ensure profit and benefit in commercializing Maswangi.

Another way to fix paddy price at RM830/t is to increase the GRR rate. As previously mentioned, the highest GRR rate for Maswangi was 45% which was much lower than normal variety. If it can be

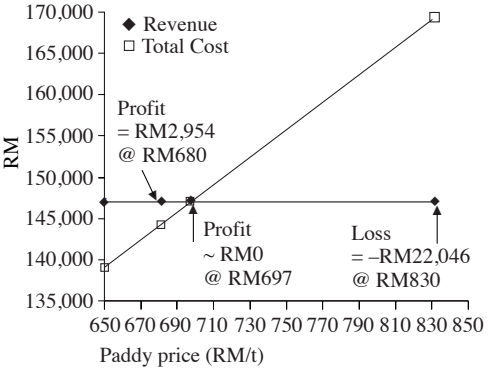

Figure 4. Break even price for millers processing Maswangi when recovery result was at 45%

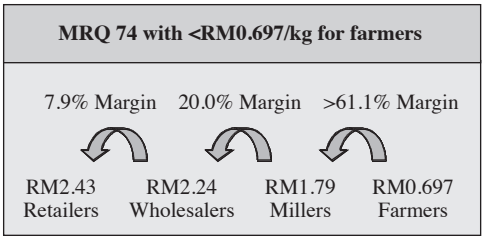

Figure 5. New gross profit margin producing Maswangi when paddy price was set to RM0.697/kg

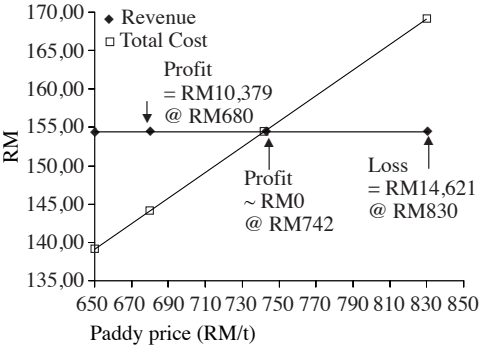

Figure 6. Break even price for millers processing Maswangi when recovery result was at 50%

increased by 5%, millers would get a profit of RM10,379/t, followed by 10% which is RM17,804 profit per 150 t of paddy *(Figure 6)*.

Production cost

The difference in production cost between Maswangi and the normal rice variety (farmer was previously planting MR 219 variety) had slightly decreased with pesticide and herbicide applications. It could potentially change input use by farmers due to its resistance to blast (Asfaliza et al. 2008) especially in planted areas (Rantau Panjang, Kelantan). The production cost of Maswangi was estimated at RM1,483 including ploughing (28.8%), seeds (17.9%), fertilizers (9.3%), herbicides and pesticides (4.2%), labour (7.3%), harvesting (13.5%), PPK commission (1.6%), transportation (6.1%) and land rental (11.3%) (*Table 3*).

The normal variety had involved higher costs for herbicides and pesticides which led to higher labour cost. However, Maswangi seeds were more expensive. Normal variety seeds were priced at RM28/bag while Maswangi seeds (registered) were at RM35/bag. The estimated production cost of normal rice variety was RM1,551 consisting of ploughing (27.6%), seeds (13.7%), fertilizers (8.9%), herbicides and pesticides (8.8%), labour (9.9%), harvesting (12.9%), PPK commission (1.5%), transportation (5.9%), and land rental (10.8%). Herbicides and pesticides cost difference of RM74.40 effects on labour cost for chemical spraying. Other costs remained the same by assuming that there was no effect in using a different variety.

The minimum paddy price for Maswangi is RM650/t, which was equivalent to the Guaranteed Minimum Price (GMP). However, this would increase with the increase in paddy quality produced by farmers. The off season 2005 record showed that the highest yield (5.2 t/ha) was from a contract farmer in PPK Rantau Panjang. Good farmers' attitude and efficient farm management are the major factors contributing towards high production.

The average yield of Maswangi is 3 t/ha. Total paddy area for the 16 farmers was 34.8 ha. A profit for each hectare of Maswangi is approximately RM1,211 for paddy price set at RM650/t and RM1,301 for paddy price set at RM680/t. The profit for normal variety is RM1,143/t.

In analysing the production cost for Maswangi using partial budgeting approach (Kay and Edwards 1999), two scenarios have been chosen: 1) paddy price remaining the same at RM650/t,

Table 3. Differences in production cost between normal and Maswangi variety (off season 2005)

	Normal variety (Paddy price at RM650/t)	Maswangi variety	
		Paddy price at RM650/t	Paddy price at RM680/t
Yield (t)	~ 3	~ 3	~ 3
Subsidy (RM)	248.10	248.10	248.10
Total sales (RM)	2,694.30	2,694.30	2,784.30
Seeds (RM)	212.04	265.05	265.05
Herbicides & pesticides (RM)	136.34	61.94	61.94
Labour (RM)	154.09	107.59	107.59
Cost of fertilizers, harvesting, PPK commission, transportation, plough and land rental are similar for both varieties (RM)	1048.46	1048.46	1048.46
Total cost	1550.93	1483.04	1483.04
Profit/(Loss)	1,143.37	1,211.26	1,301.26

Table 4. Partial budgeting analysis if paddy price remains the same

Additional cost		**Additional revenue**	
Seeds	RM53.01		
Reduced revenue		**Reduced cost**	
		Herbicides & pesticides	RM74.40
		Labour	RM46.50
A. Total additional cost and reduced revenue	RM53.01	B. Total additional revenue and reduced cost	RM120.90

Net change in profit: (B – A) = RM67.89

Table 5. Partial budgeting if paddy price is increased to RM680/t

Additional cost		**Additional revenue**	
Seeds	RM53.01	Paddy price	RM90.00
Reduced revenue		**Reduced cost**	
		Herbicides & pesticides	RM74.40
		Labour	RM46.50
A. Total additional cost and reduced revenue	RM53.01	B. Total additional revenue and reduced cost	RM210.90

Net change in profit: (B – A) = RM157.89

and 2) paddy price is increased to RM680/t (based on the breakeven price analysis for miller). This is to show that even when paddy price is set to a minimum, farmers can still get extra benefit when planting Maswangi, especially in areas prone to blast disease. The additional benefit acquired by using Maswangi is rather small and needs to increase so that the variety can be commercialized and be a substitute for other specialty rice consumed by Malaysians. The profit advantage of Maswangi when paddy price is set at RM680/t is RM157.89 and RM67.80 when there is no difference in the prices of both varieties (*Tables 4* and *5*).

Conclusion and recommendation

Maswangi (MRQ 74) can be commercialized as indicated by the study. Each entity (farmers, millers, wholesalers and retailers) involved in the commercialization will get extra benefit. Millers need to increase paddy price from RM650 to RM680 per tonne based on the profit margin analysis. This is to ensure that farmers will still be in favour of planting Maswangi and attract others to join them. Commercialization of Maswangi will assist the government mission to increase the self-sufficiency level (SSL) especially in substituting Maswangi for the Ponny and Basmathi rice from Pakistan. The results of this study are useful for the industry on the production of Maswangi on a large scale.

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Abstrak

Maswangi (MRQ 74) telah dilesenkan kepada Pertubuhan Peladang Kawasan (PPK) pada 2005 untuk aktiviti menanam, memproses, membungkus dan memasarkan beras, dan MARDI akan menyediakan bantuan teknikal, benih sah dan mempromosikannya melalui pameran dan ekspo pertanian. Kajian ini merungkai masalah dan halangan yang dihadapi dalam proses pengkomersialan Maswangi di pasaran tempatan. Margin keuntungan yang sesuai bagi setiap pihak yang terlibat ditentukan daripada harga yang ditetapkan pada peringkat kajian pengguna. Segmen pasaran ditumpukan kepada pengguna bangsa Melayu dan mempunyai saiz isi rumah yang kecil. Harga yang dicadangkan agak rendah iaitu sekitar RM2.43/kg. Harga padi bernilai RM680/t dicadangkan untuk memastikan margin keuntungan yang berpatutan untuk pengilang dan petani. Daripada hasil kajian ini, Maswangi boleh dikomersialkan. Pengilang akan mendapat untung bersih sebanyak RM2,954 setiap 150 tan diproses dan petani mendapat lebihan keuntungan sebanyak RM158/hektar. Pengkomersialan Maswangi akan dapat meningkatkan tahap sara diri terutamanya untuk menggantikan beras Ponni dan Basmathi dari Pakistan.