STUDY ON ACTIVITIES OF RICE MILLS IN MEKONG DELTA

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ABSTRACT

The study showed that capacity of rice milling plants ranged from 30 tons to 500 tons per day, average of 170.2 tons/day. There were 20% millers operated over ideal capacity / year, from 130 – 141%. However, almost millers (80%) operated below ideal capacity/year. The paddy inputs among millers were ranged from 6 tons to 500 tons/day, average with 136 tons/day. The percentage of head rice recovery for brown rice was the highest in Winter Spring season (Dong Xuan), followed by Autumn Winter season (Thu Dong), then Summer Autumn (He Thu) with the value of 73.44%, 71.67% and 68.81%, respectively. In case of IR50404, the head rice recovery was the highest among other rice varieties. This was one of the reasons why this variety was grown in large scale area even it exhibited very low quality. For grain moisture, it ranged from 15% to 18% before milling. The ideal moisture content of paddy milled was 14-16%. The status of rice husk consumption was not stable in the output with beneficial to millers, consumers and environment. For the low quality rice varieties such as IR50404, OM576, occupied in total paddy milled range from 10-80%, average of 48%. The varieties with moderate quality occupied 35%, and high quality one was only 20%. The suitable channel for input and output of the millers showed in three processes: rice from farmers and trades were sold to millers at there, rice milled into brown rice which sold to the rice polishing millers and then sold to the exporting companies. This channel indicated the high specialization but it occupied only 33% in the system. The study was also synthesized 11 main constraints, which millers faced in their rice processing activities and 10 important suggestions aimed to improve and develop rice-processing sector for export in the Mekong Delta of Vietnam.

INTRODUCTION

In 2011 rice export obtains 7.19 million tons. Accordingly, the first six months of 2012, it is estimated by VPA with 3.7 million tons (Phạm Anh 2012). Before the achievement on the production and export of rice from Vietnam in recent years, many countries have forecasted that Vietnam from second rank of rice export can replace Thailand to become top ranking in the year 2012 (Singh, 2011). As we know, the rice from production to export has to go through many stages, from farmers, purchasing traders, processing millers to exporting companies.

The study is conducted on the main objects such as farmers, millers and exporters. In the limitation of this article, the focus is on the miller's activities for rice processing for export. The millers have important role in rice processing with suitable quality for the demand of every international market. However, the specific study for this sector is still limited so far. Therefore, the results of this study are very useful for managers, researchers, processors/millers and others relating in rice production and export from Vietnam and international countries for improvement and development of rice export processing sector in particular and for rice production and export in general.

RESEARCH METHODOLOGY

- The interview schedule was designed for the millers including the issues such as: Capacity of plant, real and ideal capacity per year, sources of paddy inputs, channels for input and output, kinds and types of byproducts consumption, head rice recovery, the constraints faced in production and opportunities for improving rice processing for export…

- Component of the surveyed millers: Twenty millers in the country were surveyed, in which Cuu Long Delta had 10 millers in three provinces: Can Tho province with 05 millers (50%) which concentrated in the rice processing areas such as Thoi Lai, O Mon, and Thot Not districts. Followed An Giang province with 3 millers (30%) in Thoai Son district, and Hau Giang province with 2 millers (20%), in Long My district.

- The designation or job title of the millers providing information for the study were mainly directors of the mill (70%), business managers (20%) and only 10% was Head foreman of the millers. Therefore, the confident degree of the information sources for the study was very high.
- The survey data were synthesized and analyzed using SPSS software version 13 and Microsoft Excel. The data analyzed and represented in descriptive statistics, mean values, standard divisions, percentages, etc…
- The research conducted from March 2010 to March 2011.

RESULTS AND DISCUSSIONS

Sketching description on the characters of the rice milling plants

Capacity and real operation of the rice processing plants

Table 1. *Capacity and real operation of the rice processing plants*

Items	Capacity/day (tons)	Ideal capacity/year (tons)	Total paddy milled/year (tons)	Compared to the ideal capacity/year (%)
Mean	170.20	43,401	33,360	71.17
Minimum	30	7,650	2,040	6.67
Maximum	500	127,500	100,000	141.18
Range	470	119,850	97,960	134.51

Capacity/day of the mill during survey was ranged from 30 tons to 500 tons/day, in average with 170.2 tons/day. With these capacities indicated that the sizes of rice processing for export of these plants were relatively large. From the capacity/day, we calculated the ideal capacity/year with the assumption that the number of days operate in a year were 355 days. Total paddy milled in a year range relatively large among mills from 2,040 tons/year to 100,000 tons/year, in average with 33,360 tons/year. There were 20% of the mills operated over ideal capacity/year, from 130 – 141%. Almost the mills (80%) operated below ideal capacity/year. In which, 50% the mills operated below 50% capacity and other 30% of the mills operated below 80% ideal capacity/year. In comparison with ideal capacity, the total paddy milled per year of the plants ranged from nearly 7% up to 141.18%, in average with 71.17%.

Time of operation and the types of shifts in a day of the plants

The time of operation for rice processing for export in reality is may not same with the rice-growing season. Because of paddy input may come from the late or other seasons. The survey data were big variation among the plants. Therefore, we allocated the operation time of the mills according to the operation months in a year. The data were presented in the picture 1.

The data in the picture 1 showed that in the month of December, the rice processing activity was lowest, only 50% of the plants operating. There were 60% of the plants operated in the October and November. There were 70% of the plants operated in the months of January and September. In the months of February, April and May there were 80% of the plants operating. The highest percentages of operating plants were in the months of March and August with 90%, then June and July with 100% respectively. These months might be due to highest demand of rice in the year for export.

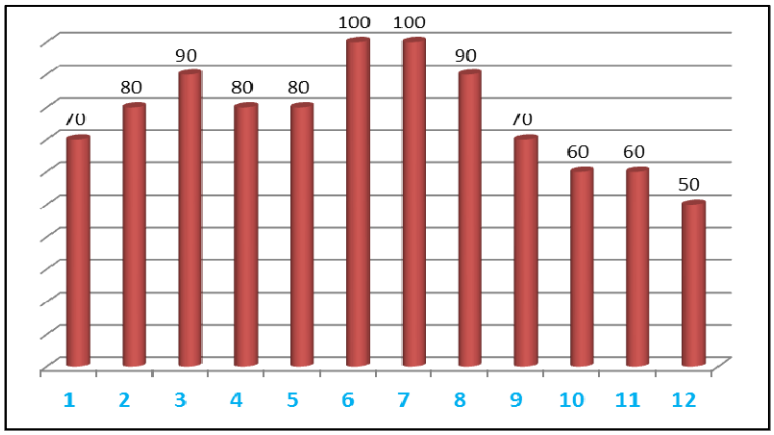


Figure 1. The percentage of the plants monthly operating in the year

According to the millers, the types of shifts depended on the plants' situation such as capacity, available workers, and the demand of paddy input for processing, the number of hours operating in a shift were different among the plants from 4 hours to 24 hours/shift and the shifts per day from 1 to 5 shifts per day. The number of hours/shift and number of shifts/day in the months of HT season less than in the DX season and this tendency was common in 40% of the plants, while 60% of the mills had tendency to operate more shifts/day and more hours/shift in the months of DX season.

There were 20% of the plants operated below the level of capacity in the months of TD season. This reasons may due to milling demand of this time is low, or due to low in total paddy input. Therefore, the paddy price those farmers sold in the TD season usually higher than other season. The same remarks were also reported in the case of Bac Lieu and Hau Giang provinces. In these provinces, the paddy price in the TD season higher than other seasons and the production efficiency of this season was relatively high (Nguyen, 2011 and 2012).

Table 2. Types of shifts operation for rice processing in the mills

Avg. number of shifts in a day	No. of plants	Percentage of plants (%)	No. of hours operation/shift
1	6	60	10, 12, 15, 20, 24
2	1	10	10
3	1	10	6
4	1	10	6
5	1	10	4

Study on the rice processing activities of the millers

Total paddy input per day and the head rice recovery after milling

Table 3a. Total paddy input per day and the head rice recovery after milling

Items	Total paddy input (Tons/day)	Head rice recovery of brown rice (%)			
		Winter Spring	Summer Autumn	Autumn Winer	Average/year
Mean	136	73.44	68.81	71.67	71.21
Minimum	6	65.00	60.00	65.00	60.00
Maximum	500	77.5	75.5	75.00	77.5
Range	494	12.5	15.5	10.0	17.5

The quantity of paddy input/day of the plants was ranged from 6 tons to 500 tons/day, average with 136 tons/day. Head rice recovery was highest in the DX season, followed TD season, and HT season with 73.44%, 71.67% and 68.81% respectively. The head rice recovery for brown rice was ranged from 60% to 77.5%, and average with 71.21%. During the survey, there were 60% of mills which milled paddy into brown rice and 40% milled paddy into white rice for export (including milling and polishing). However, they can mill both kinds of rice according to customer's demand. Almost the plants processed paddy to brown rice for the traders and it was sold to the exporting companies for polishing and exporting.

Table 3b. Head rice recovery of white rice after polishing

Head rice recovery for white rice (%)			
Items	**Head rice recovery (%)**	**Broken rice and bran (%)**	**% of husk**
Mean	62.43	15.75	20.5
Minimum	60.00	10.00	20.00
Maximum	65.00	20.00	22.00
Range	5.00	10.00	2.00

Head rice recovery for brown rice usually higher than white rice (range from 5% to 15%, average with 10%). Head rice recovery for white rice (table 3b) range from 60 to 65%, average with 62.43%. The percentage of broken rice and bran were ranged from 10 to 20%, average was 15.75%. Another byproduct is husk range from 20 to 22%, average was 20.5%. In the case of white rice processing with high broken rice up to 25%, the head rice recovery could gain 80% in some plants.

According to IRRI (2012), the maximum milling recovery is 69-70% depending on rice variety, but because of grain imperfections and the presence of unfilled grains, commercial millers are satisfactory when they achieve 65% milling recovery. Some village type rice mills have 55% or lower milling recovery. However, the percentage of head rice (exclusive broken rice) attain from paddy sample after milling in the control condition can reach to 84% compare to total paddy milled.

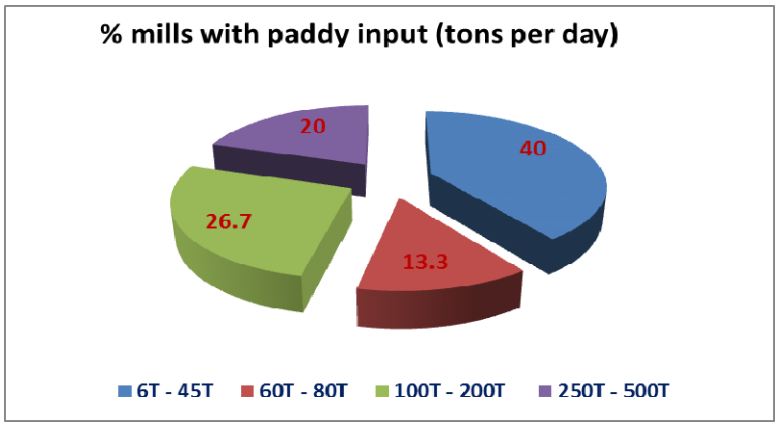
In our data, almost the millers revealed that IR 50404 rice variety gave highest head rice recovery compared with other varieties currently. This is one of the advantages that making this variety grown with high rate in the farmers' field so far, although it is low quality. On the sides of cultivating technology and yield, this variety is also has many advantages. According to the author Tam Phuc (2012), in Dong Thap province, in some districts, the cultivating area of IR 50404 can reach up to 80-90%... In terms of market, the farmers in Dong Thap, Hau Giang... meet

difficulty in the early harvesting time, but in the end of season, it is good sale with the price lower than long grain rice varieties a little bit. At the end of April, 2011, the price of IR 50404 variety were 5,000 - 5,200 VNĐ/kg, while in the same time, those long grain varieties just only higher than IR 50404 from 100 - 200 VNĐ/kg.

Since then, to reduce the area of low quality rice or reduce IR 50404 variety, we need to have the comprehensive strategy of "four-partner linkage". In which, the scientists provide high quality varieties, the managers organize farmers' production in a way of large scale and cooperation, the millers and exporters play important role in contract with farmers in the manner of transparency, favorable price and export orientation.

Distribution of paddy input per day in the different levels of the millers

Based on the survey data on paddy input per day, the data were grouped into four levels. These were from 6 to 45 tons/day; 60-80 tons/day; 100-200 tons/day and 250-500 tons/day. There were 46.7% of the mills had the total paddy input/day at level of 100-500 tons/day, of which, 26.7% at 100-200 tons/day, and 20% at 250-500 tons/day. There were 40% of millers with small quantity of milled paddy from 6-45 tons/day, and 13.3% of at level of 60-80 tons/day (figure 2).



Pigure 2. Percentages of the mills with paddy input per day

Distribution of paddy milled with moisture content

Almost the mill owners purchased paddy from farmers and traders or milling service when paddy had enough moisture content for milling (15-16%). Paddy milled with moisture content range from 15% to 18%. Usually, in the dry season there were large quantity (around 80%) of paddy with low moisture content from 16 – 17% can enough moisture for milling.

Table 4. Distribution of paddy milled with grain moisture (%)

Grain moisture	% paddy milled	Note
15 – 16%	From 60 to 100%, average 80%	Nearly 50% of the millers selected the ideal moisture content of paddy for milling with 16%
17 – 18%	From 20 to 40%, average 20%	Higher moisture content needs to dry before milling

Paddy with moisture content below 17% gave good head rice recovery for brown rice and finish products with around 15% of moisture content. According to the mill owners, the ideal moisture content of paddy for milling was from 15-17%, average with 16%. In which, 46% millers selected the ideal moisture content of paddy for milling with 16%; secondly 23% of millers with 17%; thirdly 15% of millers with 15% and lastly 15% of millers with 16.5%.

Quality component of rice varieties milling for export

The data of study showed that there were 100% of millers who milled paddy with low and medium quality. Only 50% millers milled paddy with high quality. There was also 20 % of millers did not care the quality of rice. Paddy varieties with low quality such as IR 50404 occupied 70%, and OM 576 with 10%. In addition, quantity of low quality paddy occupied from 10-80%, (an average of 48%). Paddy varieties with medium quality such as OM 2517, OM 2518, OM 4218, and OMCS 2000… occupied from 15-60% (average of 35%). Paddy with high quality such as Jasmine 85, DS 10, DS 20, OM 4900...were milled with low quantity (average of 20%). This finding is almost coinciding with the situation of rice export quality of Vietnam in the current years. That is, rice export from our country mostly with low quality (Nguyen, 2012).

Table 5. Variety-wise and type wise break up of paddy milled (%)

Kinds of paddy variety	% of plants	% of total paddy milled	Representative paddy varieties
Low quality	100	From 10 – 80, mean 48	IR50404, OM576
Average quality	100	From 15 – 60, mean 35	OM2517, OM2518, OM4218, OMCS2000
High quality	50	From 10 – 30, mean 20	Jasmine 85, DS10, DS20, OM4900
Do not distinguish (mixed)	20	100	

The values of byproducts in the ways of consumption

The byproducts of rice milling are rice hulls or husk. Rice husks are generated during the first stage of rice milling. Common use of rice husks are as source of energy for cooking use and brick production. Hence, some of millers got benefit from selling the husk or other offering. The survey data showed that there were five ways of husk consumption in which the offering with free cost (unmarketable product) to brick production plants at the locality was 30%. The husks were sold with very cheap price was VND 200-300 /kg to plants for making firewood production that used as source of energy for cooking, it accounted for 20%. By selling directly to people with other purposes (VND 240 /kg) accounted for 20% and selling with large quantity as boat unit with very low price of 800,000 VN dong/boat (with boat capacity of 30,000 ton). However, some of millers had to pay for transporting so that the husks were sent to brick plants in case of husk offering that accounted for 10%. There were some cases, the millers threw husk into the rivers creating environmental pollution. Thus, it is no stable output that benefit for millers, consumers and environment. According to Quoc Dung, (2012), stated that in the peak time of harvesting in DX season, the rice processing plants operated noisily, the quantity of discharging husk without consumption have to throw into the rivers, while many brick plants are facing with lack of husk and have to work perfunctorily. In the other case, many plants have to buy husk with increasing price up to 200%, to continue working but it can not work for long time because high input. This explains why some of brick plants stopped in production. From the findings, we need to have strategy for husk consumption with multi-styles such as fertilizer, electricity, grow-medium, brick

production and firewood production… to bring social, economic and environmental efficiencies for the export rice-processing plants in the Cuu Long Delta region.

Table 6. Types of husk consumption currently in the rice processing plants

No.	Types of husk consumption	Price (VNĐ/kg)	% of milling plants
1	Offer to brick plants	Cost free (unmarketable product)	30
2	Sold with very cheap price for firewood production	200 - 300	20
3	Sold for the other needed people	240	20
4	Cost free plus cost of transportation	unmarketable product	10
5	Sole very low price from 700,000-800,000 VNĐ/boat	700,000-800,000 VNĐ/boat	10
6	Plants without husk	-	10

Table 7. Types of bran consumption after milling in rice processing plants

No.	Types of bran consumption	Price (VNĐ/kg)	% of milling plants
1	Sold for raising companies	From 2500 – 5000, mean 4000	80
2	Sold crude bran	300	10
3	Plants without bran	-	10

Compared to husk consumption, the consumption of bran was stable and effective when almost of the millers (80%) sold bran to the companies raising cattle and poultry. The bran prices were ranged from VND 2500 to 5000 /kg, an average of VND 4000 /kg. There were 10% of the plants sold crude bran with the price of VND 300 /kg. 10% remaining of the plants had no byproduct with bran.

Study on the channels of input and output of rice processing plants

Sources of paddy inputs for export rice processing plants

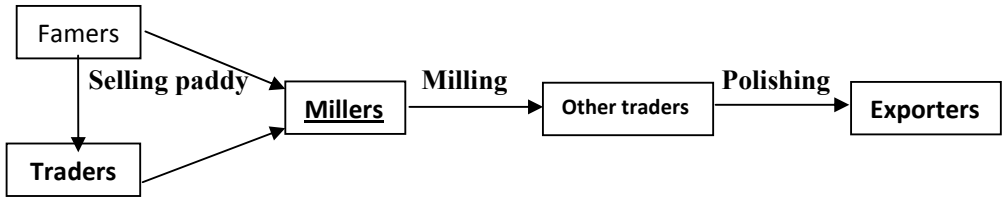
The inputs for rice processing of the plants included in two steps. Firstly, paddy was milled into brown rice. Secondly, the brown rice was polished to white rice. Inputs from traders occupied 60%, and from the farmers occupied 30%. Of which, there were small number of farmers that had a package from rice producing, rice transportation and paddy milling into brown rice then sold this brown rice to the millers to get more return instead of selling paddy directly. In addition, there were 10% of the plants had inputs from other companies or agencies according to contracts.

Table 8. The inputs for export rice processing plants (%)

Sources	Mean	Minimum	Maximum	Range	Note
Farmers	30	0	100	100	
Traders	60	0	100	100	
Others	10	0	10	10	Milling for other companies/enterprises according to contracts

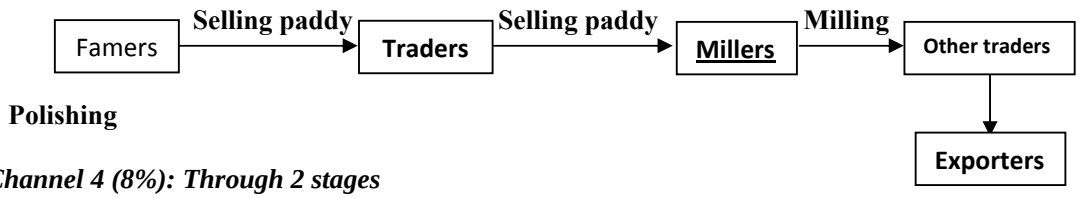
Channels of inputs and outputs of the export rice processing plants

Channel 1(42%). via three stages



Channel 2 (33%): Through 3 stages

Channel 3 (17%): Through 4 stages



Channel 4 (8%): Through 2 stages

Figure 3. Four channels of inputs and outputs of the rice processing plants

Based on the survey data, we clustered them into four channels of input and output of the rice processing plants (see in figure 3).

Channel 1: This channel was relatively popular due to nearly (42%) of the plants operated. This channel included 3 stages: Millers bought paddy from farmers and traders, after that paddy milled into brown rice, then sold brown rice to other traders. From these traders, brown rice were polished and sold white rice to exporters.

Channel 2: Channel 2 was less popular compare with channel 1 (33%). However, it is short and sustainable with only 3 stages: The traders bought paddy from farmers, this paddy then milled into brown rice and sold it to millers. In this case, brown rice were polished into white rice and sold to exporters by millers

Channel 3: This channel was operated with 17% of plants and it through 4 stages: Farmers sold paddy to traders, then traders continuously sold paddy to the millers. At there, the paddy were milled into brown rice by millers and they sold it to other traders. These traders polished brown rice into white rice and sold it to exporters.

Channel 4: This channel was occupied only 8% of the plants. Channel 4 applied in cases of farmers have transportation condition (boats), and they know how to gain more profit. Instead of selling paddy directly. In this case, the paddy were transported to the plants to mill paddy into brown rice, then sell this brown rice to the millers. The millers polished brown rice into white rice and sold it to the exporters.

In the evaluation of four channels of input and output of rice processing plants, we concluded that, channel 2 is the best one for sustainable and efficient production for entire the system,

and enhances the high specialization of every component.

Profit in rice processing activities of the millers

The study had only 60% of millers who informed about cost and profit in the process of rice processing for export as follows:

- Cost of milling paddy into brown rice was VND 75,000 /tons.

- Profit for milling paddy into brown rice was ranged from VND 70,000 to 400,000 /ton.

- Profit for milling white rice was ranged from VND 140,000 to 300,000 /ton.

- In addition, there were 10% of the plants gained 3% of profit comparing to total cost.

Paddy drying details in some rice processing plants

Drying paddy apply only for milling brown rice if the moisture is still high. Seventy percent of the plants were not dry paddy due to paddy input from farmers and traders were already dried or they milled brown rice into white rice with suitable moisture content.

- There were only 30% of the plants dried by sun or used dryers when paddy input having high moisture content. Usually, these plants dried paddy via sunshine-power in the Winter-Spring season, and use dynamical dryers in the Summer-Autumn and Autumn-Winter.

- For milling brown rice with different moisture content into white rice, the millers dried down with suitable moisture content using drying part combine in the milling system of the plants.

Table 9. Paddy drying details in some rice processing plants

Season	Place where dried	Drying technology (dryer/sun)	How long (days/hrs.)	Initial moisture content (%)	Final moisture content (%)
Winter-Spring season	Yards inside the plants (20%): Roads (10%)	Sun	2-3 days	17.5-20	16-17
Summer-Autumn & Autumn-Winter season	Dryers at companies	Dryer	5-9 hrs.	18-20	15-17

The situation of 30% of the plants needed to dry paddy was as follows: Dried by sun inside the plants (20%) and dried by transportation roads with 10%. Time consume for dry by sun about 2 – 3 days. In case of used dryers, time consume from 5 – 9 hours. The initial moisture content of paddy before applied to mill range from 17.5 to 20% in the DX season and from 18 to 20% in the HT & TD seasons. The final moisture content in paddy for milling range from 16 to 17% in the DX season and from 15 to 17% in the HT & TD seasons. The final moisture content in white rice was ranged from 12 to 13%. Thus, paddy moisture content in the raining season was higher than in the dry season, however, this variation on moisture content of paddy was not so clear.

Table 10. Distribution of paddy milled with moisture content

Moisture content range of paddy	% paddy milled	Final moisture content for finish products (%)
17.5 – 20% (DX season)	60-100	Brown rice 15%
18 – 20% (HT & TD season)	20-40	
Moisture content range of brown rice	-	
16-17% (DX season) 15-17% (HT&TD season)	-	White rice 12 – 13%

Evaluation on electricity supply for rice processing of the plants

In general, the millers have rated electricity supply are good. Usually, every plant still reserved electric generator in anticipation of blackout. The prevailing prices in the 2010 – 2011 Winter-Spring was VND 1,000 /kW. Electricity cost informed from some millers ranged from VND 15 – 20 million /month, and from VND 40 – 50 million /month; it depends on size of the plants. Almost millers revealed that they have received information of no-current time to arrange their activities and to strengthen their electricity generators.

The results in interview of the millers to rate electricity service for rice processing in the region revealed that here were five levels from very good to very bad. The results presented in the figure 5. In which, the level of "very good" with 30%, "good" with 50%, and still 20% of the millers rated with "not good". The reasons for this are increasing electricity price (from VND 50,000 to 75,000 /ton), unstable electricity supply, and blackout from 2 – 4 days/month.

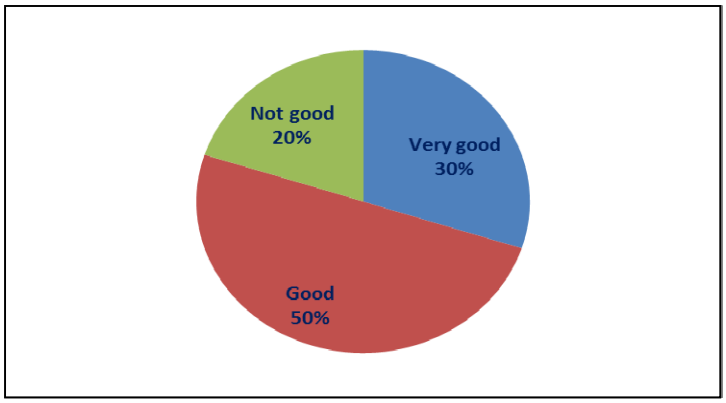


Figure 4. Evaluation on electricity supply for rice processing

Major constraints faced by the millers for rice export processing in Cuu Long Delta region

Table 11. Major constraints faced by the millers for export rice processing

1	Lack of production capital and enlarge size of the plants
2	Small and scattered plants, backward means, and not invest for enhancing and modernization yet
3	Product price is low and unstable
4	Lack of exporting markets and unstable outputs
5	Lack of storehouse, drying yards, and dryers
6	Electricity and fuel prices are high
7	Lack of paddy input in the middle of seasons
8	Unstable in working labours everyday
9	Difficulty in the transportation by rivers and canals
10	Electricity supply for rice processing is unstable
11	Fees for money transfer through interbank and to other companies are still high

From our study, we synthesized into 11 main constraints which faced by the millers in rice processing for export. According the important levels, these main constrains were arranged as follows: Lack of production capital and enlarge size of the plants; Small

and scattered plants, backward means, and not invest for enhancing and modernization yet; Product price is low and unstable; Lack of exporting markets and unstable outputs; Lack of storehouse, drying yards, and dryers… (see in table 11). In addition, some millers revealed that they equipped plant with modern equipment such as color sorter (the machines use to classify rice grains, to reject different color and different size of grains, to make rice grains become uniform). However, many of millers not yet use the color sorter or not demand for equipment this machine. This meant that the rice export products from Vietnam mostly come to the countries with demand of low quality rice and with low value.

Some millers revealed that they had no constraint due to they have enough staffs and workers, and facilities to operate rice processing smoothly. Another advantage in some millers are in the side of income tax and VAT. These taxes in the initial time was 28% of net profit after tax, but after that, there was a subsidy from local government, this tax has reduced at 15% creating the favorable condition to the millers.

Table 12. The crucial suggestion for improvement and development of paddy milling sector

1	Credit investment with low rate for production and upgrade the plants
2	Modernization from rice processing, packing, storage to transportation systems
3	Upgrade and improve small, scattered and backward plants; develop modern and large plants
4	Organize and promulgate stimulating policy for farmers to grow high quality price in the way of large scale, cooperative and consumption for export
5	Provide good and comprehensive equipment for white rice processing
6	Improve and develop warehouses, drying yards and dryers
7	Keep stable, and high price of outputs
8	Decrease fuel price, and stable supply
9	Need the support from local governments
10	Need to take part in the exporting food association

From our results, we synthesized 10 suggestions for improving and development the export rice processing sector. These suggestions have arranged according to their importance mentioning in the table 16. These included that

(1) Investing credit with low rate for production and upgrade the plants;

(2) Modernization from rice processing, packing, storage to transportation systems;

(3) Upgrading and improving small, scattered and backward plants;

(4) Developing modern and large plants;

(5) Organizing and promulgating to stimulate policy for farmers to grow high quality price in the way of large scale, cooperative and consumption for export;

(6) Providing good and comprehensive equipment for white rice processing...(see in table 12)

CONCLUSION

The millers have the important role in the rice processing for export in the Cuu Long Delta region. Therefore, the findings from this study are very useful for the all-relating peoples. Data shows that the capacity/day of the plants ranged from 30 tons to 500 tons/day, average with 170.2 tons/day. Total paddies milled in a year among the plants were ranged with the big quantity, from 2,040 tons/year to 100,000 tons/year. Almost the plants have been operated below the ideal capacity/year. The paddy input/day of the plants is ranged from 6 tons to 500 tons/day, average with 136 tons/day. The percentages of head rice recovery get highest in the DX season,

followed TD season and lastly with HT season. In case of IR50404 rice variety gives highest head rice recovery as compared with other varieties. This is one of the advantages that this variety is grown in the large areas in the Cuu Long Delta, although it is low quality. The ideal moisture content for paddy milling according to the millers. The situation of byproduct consumption such as husks is not stable yet. In some cases, the millers throw husks into rivers due to no way for consumption and result in water pollution. For the quality of rice processing, most the plants that give low and medium paddy quality in milling. Only 50% of the plants give high quality of paddy and some plants do not concern about rice quality in milling. The low quality of paddy varieties (such as IR50404 and OM576) occupied from 10 to 80%. The medium quality of paddy occupied of 35% and high quality of paddy is only 20%. These findings are coincided with current rice quality export from Vietnam. The popular channel of input and output in summary by: channel 1 with 3 stages that paddies are bought from farmers and traders then milled into brown rice, and sold to other traders. The brown rice from these traders are polished and sold white rice to the exporters. However, the channel 2 is the best one with sustainable and efficiency production for entire system as well as enhance the high specialization of every component. For the efficiency of electricity supply, the millers rated at "very good" level with 30%; at "good" level with 50% and still 20% of the millers rated with "not good" due to increasing in electricity price, unstable supply and blackout from 2 – 4 days/month. The study have synthesized into 11 main constrains faced by the millers in rice processing for export and 10 suggestions from millers' expectation to improve and develop rice processing sector for enhancing quality and value of rice export.

REFERENCES

Akanksha Singh. 2011. Vietnam may replace Thailand as the biggest rice exporter in 2012. Dec 26th, 2011. www.thailand-business-news.com.

Nguyen Cong Thanh. 2011. Provincial project report on Building models of diversified, sustainable and effective agricultural production in Phong Thanh Dong A village, Gia Rai district, Bac Lieu province (in Vietnamese).

Nguyen Cong Thanh. 2012. Provincial project report on Building a model of combine agricultural production to help reducing poverty farmers in Long My District, Hau Giang province (in Vietnamese).

Nguyen Van Son. 2012. Rice export: mathematical problem of value. The Doanh nhân Sài Gòn Cuối tuần magazine (in Vietnamese), 22/09/2012.

Phạm Anh. 2012. Six months, rice export from Vietnam gained 3.7 million tons, www.tienphong.vn, 3/9/2012.

Quoc Dung. 2012. The husk price is increasing, and the brick plants are stop working. NhanDan online, 16/3/2012.

Tam Phuc. 2012. Headache with the rice variety IR 50404! www.baomoi.com. Online 31/05/2012.

IRRI. 2012. . Estimation of postharvest losses of rice (*Oriza sativa*) from harvesting to milling. www.knowledgebank.irri.org,

NGHIÊN CỨU HOẠT ĐỘNG CHẾ BIẾN LÚA GẠO CHO XUẤT KHẨU Ở ĐỒNG BẰNG SÔNG CỬU LONG

Kết quả nghiên cứu về công suất/ngày của các nhà máy biến thiên từ 30 tấn cho đến 500 tấn/ngày, trung bình là 170,2 tấn/ngày. Lượng lúa xay chà thực tế/năm biến thiên khá lớn giữa các nhà máy từ 2.040 tấn/năm cho đến 100.000 tấn/năm. Trung bình là 33.360 tấn/năm. Có 20% nhà máy hoạt động vượt công suất lý thuyết/năm, từ 130 – 141%, trong khi có đến 80% nhà máy hoạt động dưới mức công suất lý thuyết/năm. Lượng lúa xay chà hàng ngày của các nhà

máy biến thiên từ 6 tấn – 500 tấn/ngày, trung bình là 136 tấn/ngày. Tỷ lệ gạo lức thu hồi cao nhất trong vụ ĐX, kế đến vụ TĐ và sau cùng là vụ HT (tương ứng là 73,44%; 71,67% và 68,81%). Đối với giống lúa IR50404 cho tỷ lệ gạo nguyên thu hồi cao nhất trong các giống hiện nay. Đây là một trong những ưu điểm làm cho giống này được trồng với tỷ lệ cao hiện nay, mặc dù chất lượng gạo kém. Độ ẩm lúa khi đưa vào xay chà biến thiên từ 15% đến 18%. Độ ẩm lý tưởng cho lúa đưa vào xay chà theo ý kiến của các nhà máy dao động tứ 15-17%, trung bình là 16%. Trong đó, có 46% nhà máy cho rằng độ ẩm lúa lý tưởng đưa vào xay chà là 16%. Hiện trạng về tiêu thụ sản phẩm phụ trấu chưa có đầu ra ổn định và có lợi cho môi trường. Về chất lượng gạo xay chà, có 100% nhà máy chà lúa có chất lượng thấp và trung bình. Chỉ có 50% nhà máy chà lúa có chất lượng cao. Ngoài ra còn có 20% nhà máy không quan tâm phân biệt chất lượng lúa. Đối với loại giống lúa có chất lượng thấp (ví dụ IR50404, OM576), có tỷ lệ từ 10-80%, trung bình là 48%. Đối với loại giống lúa có chất lượng trung bình có tỷ lệ trung bình là 35%. Loại giống lúa chất lượng cao đưa vào xay chà còn rất thấp, trung bình chỉ 20%. Nghiên cứu này phù hợp với hiện trạng chất lượng gạo xuất khẩu của nước ta những năm gần đây. Kênh đầu vào và đầu ra phổ biến có 42% nhà máy áp dụng gồm có 3 công đoạn: Nhà máy mua lúa từ nông dân và thương lái, rồi chà thành gạo lức, bán gạo lức cho doanh nghiệp khác đánh bóng, sau đó, doanh nghiệp này bán cho công ty xuất khẩu. Tuy nhiên, kênh thích hợp là thương lái mua lúa từ nông dân, chà lức bán cho nhà máy, nhà máy đánh bóng, bán cho công ty xuất khẩu nhằm chuyên môn hóa cao. Nghiên cứu đã tổng hợp thành 11 khó khăn chính đối với nhà máy trong quá trình hoạt động chế biến lúa gạo cho xuất khẩu và 10 kiến nghị nhằm kêu gọi sự quan tâm của các nhà quản lý và những ơ quan liên quan quan tâm giúp các nhà máy khắc phục những khó khăn nhằm cải thiện và phát triển tiến lên hiện đại hóa hoạt động chế biến lúa gạo đạt chất lượng và giá trị xuất khẩu ngày càng gia tăng, góp phần cải thiện đời sống người nông dân.

Pigure 1. Study on site rice processing of the plants in Long My district, Hau Giang