



Food Sufficiency, Tariffication Policy, and Business Strategy: A New Business Model for the Rice Milling Industry in the Philippines

ABSTRACT

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Rice is a primary commodity in the Philippines and a staple food for Filipino families. Climate change, low yield, and decreasing number of Filipinos engaged in agriculture lead to the instability in the supply of rice and fluctuation in market price affecting local farmers, rice millers, and consumers. In an attempt to address rice shortage and lower retail prices, Republic Act No. 11203 or Rice Tariffication Law was promulgated. Given the contribution of Nueva Ecija province in the rice economy of the country, it is vital to analyze the impact of the policy in the province, specifically, on the operations of 82 registered rice millers using descriptive method of research. Results indicate that the rice millers observe the traditional practices in trading milled rice. Most of them are not engaged in importation and are facing challenges related to the sudden policy reform. From the findings of the study, a new business model is recommended to help rice millers increase the scope of their operations and acquire necessary funding from banking institutions. The new model is seen to help the rice millers gain income from different ventures, allowing them to expand, grow and help the economy in the long run. Thus, raising sustainable investments in the rice industry in the province and in the Philippines.

Keywords: Rice Sufficiency, Tariffication, Policy, Reform, Philippines

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INTRODUCTION

The Philippines is a highly agricultural country and agriculture plays a significant role in its economy (Cororaton and Corong, 2009). Rice crop is its primary agricultural product (Dawe, Moya, and Casiwan, 2005) and rice is considered a staple food for Filipino families (David and Balisacan, 1995). Rice consumption levels differ according to the age and occupation of the consumers but on the average, consumption reaches 2.2 kilograms for every person per week or 114.27 kilograms per year (Philippine Statistics Authority, 2018). Rice production alone contributes 20 percent to the Gross Domestic Product (GDP).

However, while the demand for rice increases, the agriculture sector for the last decade has been faced with significant decrease in productivity, high production costs, and low government support (Canadian International Development Agency-Philippines-Canada Local Government Support Program or CIDA-LGSP, 2003; Kikuchi, 2014; Lambert). The production of palay is also dwindling due to the conversion of agricultural lands into residential and commercial spaces, as well as, into roads and highways for public use (Rondhi, 2018; Bankoff, 1996).

The high demand coupled with unstable supply has been the cause of frequent fluctuation in the market price of palay and milled rice (Sobrevinas, 2009; Dawe, 2010). Available statistical data for 2017 to 2018 pointed to the upsurge in the farm gate prices of rice for about 7% or from 17.79 pesos (0.35 US Dollar) per kilogram in 2017 to 19.01 pesos (0.38 US Dollar) per kilogram in 2018 (Cororaton et al., 2018).

Marginalized Filipinos who rely on government's financial subsidy are forced to buy commercial rice with relatively higher price due to the limited supply of low-priced milled rice in the market and from the National Food Authority (NFA), the government agency given the function of ensuring the food security, stability of supply, and low price of staple grain rice in the Philippines (nfa.gov.ph). Two of the immediate solutions recommended to address the problems arising from insufficient supply of rice are the importation from other rice-producing countries and enactment of Republic Act No 11203 entitled, "An Act Liberalizing the Importation, Exportation, and Trading of Rice Lifting for the Purpose and The Quantitative Import Restriction on Rice and for other Purposes".

The Quantitative Restrictions on rice and imposition of tariffs have long been implemented in the Philippines as policy instruments for the regulation of international trade of goods (PhilRice, 2012) under the ASEAN Free Trade Area Common Effective Preferential Tariff (AFTA-CEPT) scheme (Batausa, 2003). The restrictions on the one hand come in the form of quota or licensing requirements to limit the volume of commodities entering the country (Tolentino and Dela Peña, 2020). Tariff on the other hand is the tax being paid to the government for the imported or exported goods (Moutos, 2001). But, recently, trade liberalization has pushed through, easing the flow of goods and services by loosening the restrictive measures (Batausa, 2003).

The Republic Act No. 11203 or the Rice Tariffication Law approved on February 14, 2019 by President Rodrigo Duterte (Tobias, 2019) liberalized rice imports but imposed a tariff of 35% on shipments of grains from Southeast Asian regions. The imposition of tariff intends to generate Rice Competitive Enhancement Fund (RCEF). Through the RCEF, the government aims to finance the modernization of the farming industry and provide funds for farmers, farming business, financial institutions and rice cooperatives (National Economic Development Authority, 2019).

Typically, the price of rice increases when there is inadequate supply to cater to increasing demand. However, during the first quarter of 2019, the farm gate price of

palay have declined by 1.12 percent (Bautista, 2019) reflecting how government interventions seemingly are falling short in addressing the demand and securing the supply of rice in the market (David & Balisacan, 1995). Contrary to what was expected, the law's immediate effect includes less income for local farmers due to inadequate safety nets. The price of palay has been greatly affected due to importation and the presence of large volume of imported grain in the market which were sold at much lower price. In some provinces, the price of palay reached as low as seven pesos (0.14 USD) per kilogram. Far less than the estimated return of investment.

The Central Luzon (Region III) in the Philippines which is an agricultural area also experienced the negative effect of tariffication and lifting of quantitative import restriction on rice. The province of Nueva Ecija alone dedicates 249.9 thousand hectares for its rice crops (Philippine Statistics Authority, 2019) but, the sudden decline in palay prices has forced the local farmers to sell their agricultural lands so they can finance other needs. Many rice millers meanwhile experienced financial drought that has led to the temporary or permanent closure of their milling businesses. Many families in the province depend on agriculture so are the 82 rice mills in the locality (National Food Authority, 2019) whose operation lies in the processing of harvested rice and selling of its by-products.

Rice mills play important role in food sufficiency as they turn palay into rice that can be sold, cooked, and consumed. However, at least 3,000 rice mills nationwide have stopped their operations due to the influx of cheaper imports. Available records seem to agree as it was reported that only 60% to 70% out of 10,000 rice mills nationwide were able to continue their operations following the implementation of Rice Tariffication Law (Co, 2019).

The untoward situation has prompted the government to intervene through the local government units by allotting fund for the direct purchase of local farmers' harvests, maximizing the use of public funds to establish "fair" palay price. The government also conceptualized a 1.5-billion-peso (30 Million USD) loan assistance program for farmers in cooperation with the Department of Agriculture (DA), Agricultural Credit and Policy Council (ACPC) and Land Bank of the Philippines (LBP) to roll out the Expanded Survival and Recovery Assistance Program for Rice Farmers. The measure is expected to provide immediate assistance to continuously finance domestic agricultural activities.

Nevertheless, the rice millers found certainty amidst the uncertain situation since several of them have taken advantage of the newly-implemented law. Rice mill businesses with enough capital have shifted to importing rice, particularly higher value rice with significant local demand. In spite the 35% import tariff, they still manage to earn higher margins than the taxes they pay to the government. A manifestation that the reform calls for innovation in existing business models to conform with the mandates of the rice tariffication law while enhancing the resiliency of the rice industry.

There are few literatures focused on assessing the impact of the Rice Tarrification Law in the Philippines. The existing studies found the positive impact of the Law to the families with low income while a negative impact to the rice growers (Balié et al., 2021; Cororaton & Yu, 2019; Vertudes et al., 2020). The novelty of this study is its offering of new business model to the rice millers and growers that could raise sustainable investment and resiliency to the rice industry. With the current situation of businesses, production industry, household income, and the rice industry that are negatively affected by the COVID-19 pandemic (Schmidt et al., 2021), the findings of this study would be a significant baseline data on the field of food sufficiency, tarrification policy, and business strategy.

The study seeks to analyze the operations of rice mills in the province of Nueva Ecija and from the findings devise a new business model out of Drucker's Business Model (Figure 1) that will raise sustainable investments in the rice industry in the province and in the Philippines. Also, the study determines the rice mills' a) profile (number of years in operations, net worth, warehouse capacity, capital, number of retail outlets); b) operations (pricing, buying and selling activities); and c) problems encountered.

LITERATURE REVIEW

The business sector according to Drucker (1994) has the ability to change its strategies, assumptions, and policies to suit the demands of the market, consumers, and technological advancements. The organization's behavior is seen as something that dictates the decisions about what to do and what not to do in order to come up with meaningful results.

According to the theory, even businesses that have enjoyed long-term success at some point hits stagnation, finding themselves incapable of coping with the demands (Drucker, 1994). Therefore, the need to innovate and find new ways of doing business (Lambert, 2013). The diagram below shows the concept contained in the model.

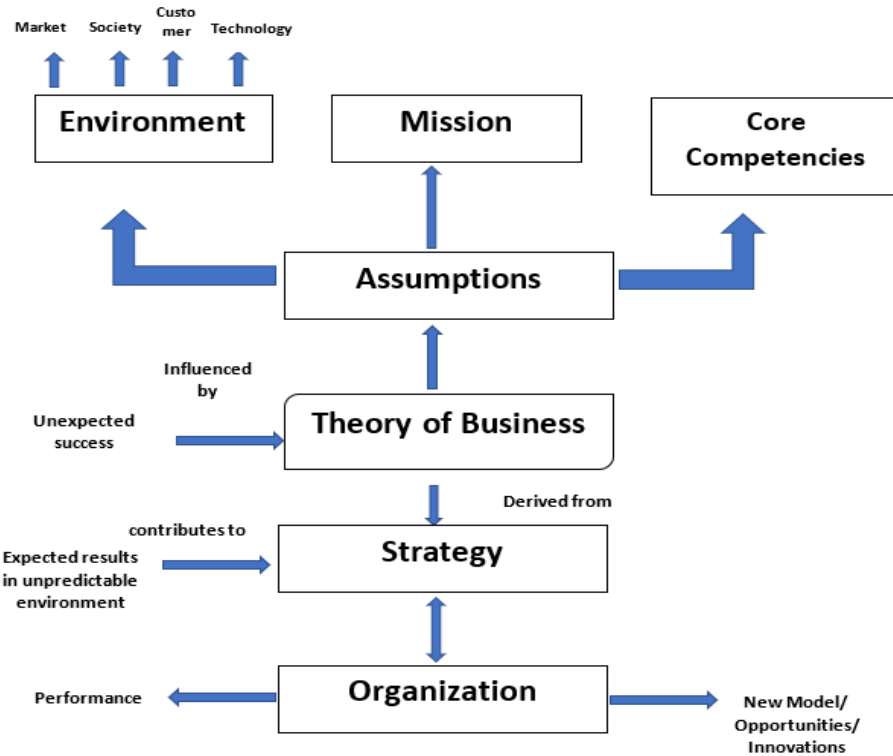


Figure 1. Framework derived from Peter Drucker’s (1994) Theory of Business

In spite of having definite objectives, the organization’s original goals can also become obsolete. The unexpected success and unexpected failures from rapid growth, incongruence between economic globalization, political splintering, or new standards of performance signal the need to come up with new models. The business model concept is useful in analyzing and communicating the essence of business, making predictions, and providing explanations on the new ways of doing business (Lambert, 2013).

The study aims to develop a new model based on the theoretical framework presented to define where the rice mill businesses may devise strategies depending on what the customers value or on what the market trend dictates.

METHODOLOGY

The study analyzed relevant published researches and literatures and the results of the survey and interview conducted with the operators/owners of 82 rice mills from the 20 municipalities in the province of Nueva Ecija in the Philippines. The data collection was carried out during the first quarter of 2020. The study also employed direct observation to explore how the subject of the study operates and to triangulate the data collected out of the responses made by the operators/owners.

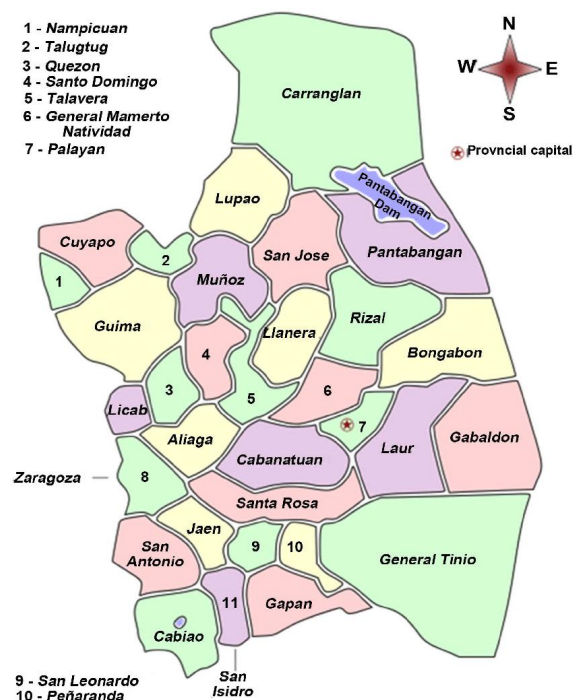


Figure 2. The Map of the Province of Nueva Ecija

RESULTS

The summary of the descriptive statistics of the variables measured are presented in this section. Frequency, percentage, and weighted mean were used to show the distribution of the responses.

Profile of the Rice Mill Businesses

One of the determinants of profitability is the number of years a business has been operating (Burja, 2011) as it signifies good service and good management. The data reflects that the income of the rice mills is substantial to make them survive in the industry. It is also evident that majority of the rice mills in the province have been in existence for more than 20 years having percentage of 40.24%, while 35.37% have been operating for 16 to 20 years, and 13.41% are under 11 to 15 years. Only 7.32% are operating for 6 to 10 years and 3.66% are still under 1 to 5 years operation.

Rice mill business requires large start-up capital to establish. Enough fund must be allotted for the purchase of vehicles, equipment, and machineries to support its operations. The data reveal that 59.76% of the rice mills are classified as “Large” having net worth or asset value of the company at 100,000,000.00 Philippine peso (PHP) or 2 million USD and above. While 40.24% of the rice mills are under “Medium” classification having a net worth of 15 million PHP to 100 million PHP (300,000 to 2 million USD).

Having spacious warehouses is crucial in the operation of rice mills since they serve as the storage for raw and processed products, and buffer stocks. Based on the data gathered, the storage capacity of rice mills in Nueva Ecija ranges from 12,000 cavans to around 100,000 cavans of rice. To finance their operations, rice millers in the Philippines should have a minimum capital of 10,000,000.00 PHP (200,000 USD) to 25,000,000.00 PHP (500,000 USD). This is because they will invest on machineries, manpower resource, equipment, and construction of large storage facility to house raw materials and processed products until they are good for distribution. Based on the results, 52.43% of the respondents invested a capital ranging from 7,000,000.00 PHP (140,000 USD) to 150,000,000.00 PHP (300,000 USD) while 47.56% mentioned that they invested 160,000,000.00 PHP (3.2 million USD) to 300,000,000.00 PHP (6 million USD) excluding the amount expended for fixed assets. As the number of retail outlets increases so with the start-up capital.

In the business sector, consideration is given to the selection of the right location for the business space. It is therefore not surprising that the respondents own several outlets in various municipalities. The data reflects that the competition is tight among the rice millers. Data show that 29.27% have 21-25 retail outlets, 20.73% have 11-15, while 18.29% have 16-20 retail outlets. Moreover, around 17.07% have 26 and above retail outlets and 14.63% have less than 10 retail outlets.

Operations of the Rice Mills

All the Rice Mills included in the study are engaged in the buying and selling of palay and rice. In terms of pricing, data show that rice mills in Nueva Ecija buy palay at the prevailing price directly from the farmers (72 out of 82 respondents). Another option for the respondents is to buy palay from the palay traders at a higher price (69 respondents) followed by hiring a classifier to gauge the quality of palay as a basis in determining its price (60 respondents). Fourth in rank of buying activities is to buy rice from other rice millers who are engaged in rice importation (48 respondents), and still there are rice millers that buy rice from other countries at a lower price compared to locally produced rice (38 respondents).

Meanwhile, in terms of volume, rice mills purchase palay from the palay traders (72 respondents) followed by purchasing the bulk of their palay from the local farmers (68 respondents). The third in rank of the buying activities in terms of volume is that rice mills purchase palay from the different provinces aside from Nueva Ecija (64 respondents), while 48 respondents acquire hauling services in purchasing significant volume of palay from different provinces. The last in rank shows that rice mills purchase significant volume of imported rice from other countries as well as from other rice millers (28 respondents).

When it comes to the selling activities of the rice millers, items pertaining to the selling and delivery of rice to other provinces in a higher price ranked 1st with 66 out of 82 respondents. This is followed by selling well-milled rice to leading supermarkets in the country at a higher price (59 respondents). The third is selling rice to other small retail

outlets with substantial mark-up on its price (58 respondents), while the fourth is that rice mills sell imported rice to other rice millers at a higher price (48 respondents). Lastly, rice mills sell imported and local rice directly to the consumers at a lower price (33 respondents).

The rice millers in the province also supply rice to the retailers from other provinces (66 out of 82 respondents) since most residents in palay-generating areas often leave supply enough for consumption. Meanwhile 59 respondents mentioned that rice millers sell bulk of its rice to small rice retailers in the province, while the third selling activities in rank indicate that rice mills sell significant volume of well-milled rice to leading supermarkets in the country (58 respondents). Rice mills also acquire hauling services in selling significant volume of palay from different provinces (53 respondents), and the least is selling imported rice to other rice millers (34 respondents).

During harvest season, rice millers purchase palay at 16 pesos to 19.50 pesos per kilogram. Their bulk purchase often is within 2 million to 4 million cavans. It was revealed during the interview that the rice millers can sell the milled rice for 32 to 37 pesos per kilogram and 300,000 to 1 million cavans per month.

Challenges Encountered

Rice Tariffication Law

Based on the results, respondents agree that the implementation of the rice tariffication law has put additional burden on them (Average WM=2.94). The respondents strongly agree that they do not have enough capital to purchase imported rice from other countries (WM=3.62). While they slightly agree on purchasing imported rice from other rice millers making the rice milling facility dormant (WM=1.89). A rice miller from Aliaga, Nueva Ecija disclosed that rice importation demands large amount of capital for the payment of the goods, documentation, transportation, additional manpower, and tariff.

Table 1. Challenges encountered related to the implementation of Rice Tariffication Law

Item Statement	Law	
Our Firm...	WM	VI
1. Does not have enough capital to purchase imported rice from other countries.	3.62	Strongly Agree
2. Has lower production of milled rice due to lower production of local palay from farmers.	3.18	Agree
3. Incurs significant amount of tariff due to rice importation.	2.83	Agree
4. Suffers from low prices of local milled rice due to the influx of imported rice.	3.17	Agree
5. Purchase imported rice from other rice millers making our rice milling facility dormant.	1.89	Slightly Agree
Average Weighted Mean	2.94	Agree

Furthermore, rice millers are having problems in acquiring funds from financial institutions to finance importation even though commercial banks such as Bank of the Philippine Islands (BPI) and Banco De Oro (BDO) have allotted 15% to 30% of their total loan portfolio to agriculture-oriented businesses such as rice mills. Other loan applications however are declined by the bank after assessment indicates non-stability or insufficient capacity to repay back the loan once granted.

Volume of local palay production

Rice millers in Nueva Ecija strongly agree that they at times they are left with no option but to buy low quality palay produced by the local farmers especially when stock is limited. However, even after milling, they are having a hard time selling them because of consumers do not like the quality. There are other instances when they cannot purchase significant volume of palay even from other provinces since there are buyers who buy in bulk at an earlier date.

Table 2. Challenges encountered related to the palay production

Item Statement	WM	VI
Our Firm...		
1. Purchases small volume of palay due to low production making it insufficient to continue the rice milling operations.	2.3	Slightly Agree
2. Suffers from palay production instability over the past harvest seasons and cannot utilize the maximum capacity of the rice milling facilities.	2.32	Slightly Agree
3. Buys even low quality palay produced by the local farmers but is having difficulty selling the milled rice because consumers do not want the quality	3.98	Strongly Agree
4. Cannot produce significant supply of rice-by products due to low palay production.	2.65	Agree
5. Cannot purchase significant volume of palay from other provinces since rice millers in the area buy in bulk and come at an earlier date	2.01	Slightly Agree
Average Weighted Mean	2.65	Agree

As stated by the rice miller from Aliaga, Nueva Ecija, farming in the Philippines is labor intensive. In comparison, the Philippines is in the 8th spot in the world among countries with high production cost in a survey conducted in 2013. To lessen the cost, some local farmers tend to use low grade seeds which produce low quality palay.

Experience-wise, rice millers say that the market prefers rice of good quality because it is what the consumers look for. That consumers tend to judge the quality of rice based on texture, color and smell. Hence, the inclination of the market towards imported rice which is whiter, fragrant, looks polished, and retails in much lower price.

Rice importation

While rice importation has become a trend, not all rice millers are capable of participating in the trade. The common challenges encountered by the respondents are shown in Table 3.

Based on the table, the rice millers strongly agree (WM=3.45) that they cannot purchase imported rice in bulk. Although bulk purchasing may minimize the cost due to lesser freight charges, lesser budget required for the transportation of goods, and the like; rice millers in Nueva Ecija are confronted with financial limitations. A rice miller from Sta. Rosa even believes that it is impractical for small-scale milling business due to large capital requirement which is from 800, 000,000 to 1,000,000,000 PHP (16 million-20 million USD). Other factors that prevents the rice millers from importing rice are the lack of necessary requirements or permits (WM=2.77) nor adequate facility, equipment, and vehicle to cater bulk supply (WM=1.85).

Table 3. Challenges encountered in terms of Rice Importation

Item Statement	WM	VI
Our Firm...		
1. Cannot purchase imported rice in bulk	3.45	Strongly Agree
2. Suffers from influx of imported rice and local rice production cannot cope up with the supply of imported rice.	2.93	Agree
3. Cannot purchase imported rice above 350,000 metric tons.	3.29	Strongly Agree
4. Does not have the necessary requirements, permits and other documents to import bulk of rice inventory to be used in our operations.	2.77	Agree
5. Does not have the necessary facilities, equipment and vehicles to cater and handle bulk of imported rice.	1.85	Slightly Agree
Average Weighted Mean	2.86	Agree

Income of the Rice Millers

The Philippines is a country that depends on agricultural products such as rice crops for a living. Aside from the palay and milled rice, the by-products of rice also provide indirect income (Bodie, et al, 2011). The rice bran is sold to livestock raisers since it is used as animal food. The rice hull is also sold for conversion into bio gas for the use of various industries. Over the years, the by-products of rice serve as the key sources of income as they can be used in the animal industry and bio gas industry. Unfortunately, rice millers slightly agree that they experience low income from the sale of rice by-products due to low palay production with a weighted mean of 2.79.

Other Problems Encountered

Insufficient fund to engage in rice importation, lack of capital, low quality of palay produced by farmers, high cost of production for local rice, low price of rice due to influx of imported rice, and low income from by-products of rice due to African Swine Flu are some of the problems common to the rice millers included in the study.

A rice miller from San Jose City, Nueva Ecija narrated during the interview that the conversion of agricultural lands into industrial, commercial, or residential lots contributed to low production of palay not only in the Province but in the entire Philippines. He believes that the situation may aggravate other societal problems since the population of the country continue to increase but the number of arable lands is declining at a faster rate. From his statement and the available literatures, it can be said that rice self-sufficiency might be harder to achieve in the near future because of the growing population of the Philippines and conversion of agricultural lands into industrial, residential, and commercial areas. The rice millers also stated that the Philippines has

now lesser capacity to supply the needed rice for consumption of the public, hence the need to import rice from other nations. The once rice exporter is now relying on its neighboring countries not merely because of limited supply but because of the higher domestic production cost.

Table 4. Challenges encountered in terms of Income

Item Statement	WM	VI
Our Firm...		
1. Deals with the continuous decline in terms of our overall income every harvest season.	2.2	Slightly Agree
2. Incurs more operational expenses rather than sales of rice products.	2	Slightly Agree
3. Experiences low income from the sale of rice by-products due to low palay production.	2.79	Agree
4. Deals with low sales earned from selling local milled rice due to lower prices in the market.	2.43	Slightly Agree
5. Experiences overall losses as we cannot utilize the maximum capacity of our rice milling facilities.	2.2	Slightly Agree
Average Weighted Mean	2.32	Slightly Agree

Food Sufficiency, Tariffication Policy, and Business Strategy

To triangulate the data collected from the rice millers, secondary data were collected from the National Food Authority (NFA) as shown in Table 5.

Table 5. Comparison of figures Gathered from NFA and Rice Millers. (January to March of the year 2020)

NO.	Factors	Based on the NFA (National Food Authority)	Based on the respondents (rice millers)
1	Milling capacity	60 to 100 cavans per hour	50 to 100 cavans per hour
2	Warehouse capacity	100,000 to 120,000 cavans	70,000 to 100,000 cavans
3	Capitalization used	10 million to 25 million PHP (200,000 to 500,000 USD)	7 million to 300 million PHP (140,000 to 6 million (USD)

It can be noted from the table that the milling capacity, warehouse capacity, and capitalization used by the rice millers in Nueva Ecija are almost the same with the data given by the National Food Authority. The result not only validates the responses of the rice millers but also reveals the situation in the province and the challenges confronting the rice millers. It also denotes that the government truly has knowledge about the situation on the ground and the plight of the Filipino farmers, rice millers, and business ventures related to the rice industry.

Ranking of the Problems encountered by the Rice Mills

Table 6. Ranking of the Problems of the Rice mill Businesses

Problems	AWM	VI
Rice Tariffication Law	2.94	Agree
Volume of Rice Importation	2.86	Agree
Volume of Local Palay Production	2.65	Agree
Income of Rice millers	2.32	Slightly Agree
General Weighted Mean	2.69	Agree

Based on the result, the main problem of the millers is indeed the sudden imposition of the rice tariffication law. Secondary to it are the problems arising from difficult competition between local and imported rice due to the influx of imported rice, the decreasing local yield, and lastly, the reduced income of rice millers that threatened their operations. The rice milling industry is having problems adjusting to the new practices brought by the new trends in buying and selling rice and its by-products. Importation further affected the other aspects of their operations including income generation. All of them agree that there is a need to lower the prices of the locally-produced rice to compete with the influx of the imported rice. However, it will compromise the labor force and the local farmers.

Proposed New Business Model for Rice mills

The development of new technology for food production is essential to sustain man's needs for survival (Pascual et al., 2018). This includes new models for technology or business. The following are future plans and changes in the Rice Mills operations input

to new business model, to wit: 1) Pooling of funds of different rice millers for rice importation; 2) Contracts between rice millers; 3) Diesel generators instead of using regular electricity; 4) Own power plant using Rice Husk; 5) Community stores/retail outlets; 6) Improvement of milling machineries; 7) Focusing on rice processing of imported rice; 8) Upgrade of drying facilities to cater the demands of palay farmers; 9) Aggressively opening new branches and bring closer the rice industry to the market, to lower cost and eliminate middle men, FARM TO TABLE CONCEPT; and 10) Upgrade or inclusion of rice polishing machineries to increase the quality of rice to be sold to the market.

Based on the interview, the rice millers have provided several proposals in order to enhance their existing operations and to cope up with the changes and trend in the rice industry. The challenges, experiences, suggestions, and recommendations of the rice millers included in the study are incorporated and carefully considered by the researchers in formulating a business model patterned after Ducker’s original Model but modified according to the needs of the time and the prevailing market demands.

The components of the model are illustrated in Figure 3. The modified business model is aimed at improving or current rice mills’ operations by considering the needed innovations at different levels of the operations.

Meanwhile, the proposed procedural changes and potential stakeholder collaborations to achieve the end-goal are illustrated in Figures 4 to 6.

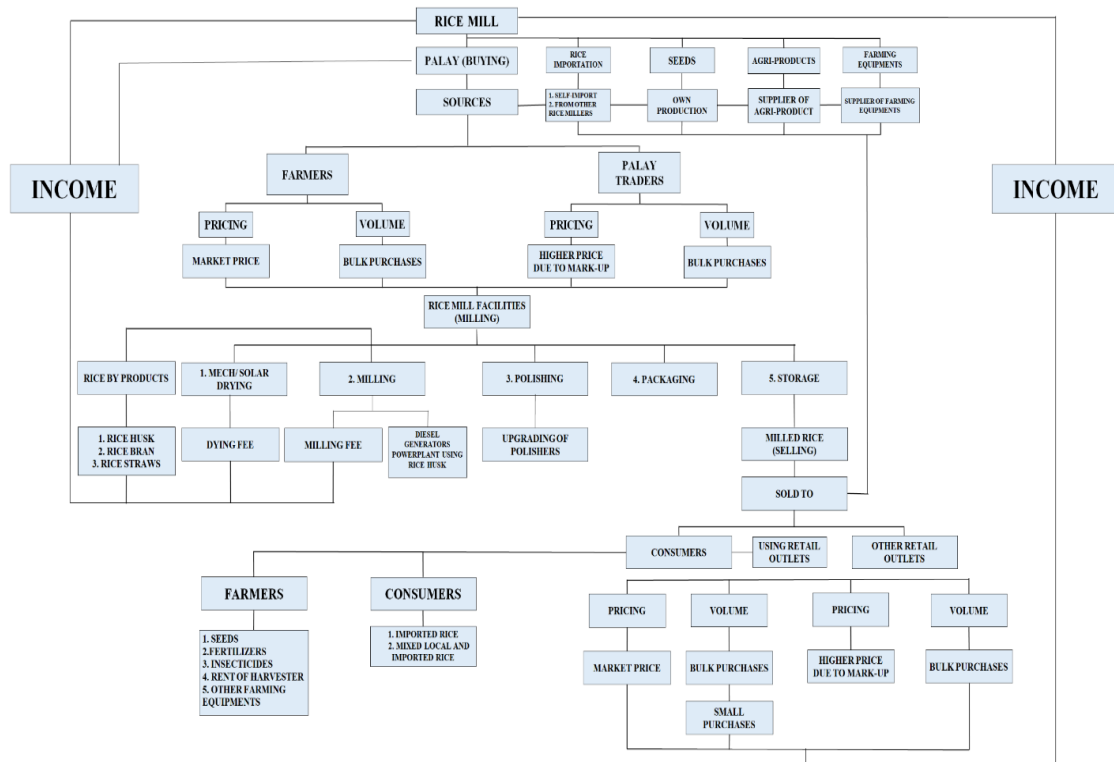


Figure 3. Modified Business Model

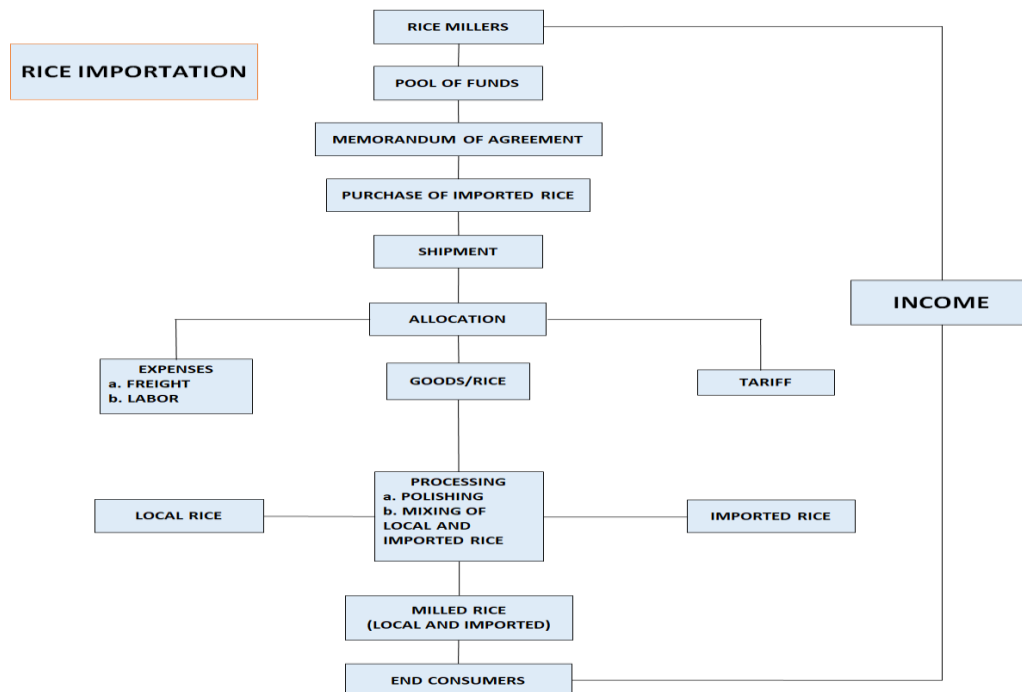


Figure 4. Rice Importation Process

It was suggested that rice millers can maximize resources by combining available funds. To illustrate, a rice miller who is not capable of importing rice because of limited resources may outsource from fellow rice miller and propose that they combine resources by entering into memorandum of agreement. For bank financing, rice millers may venture into other business still related to the agricultural industry to generate income that will be suffice to make him/her eligible to be granted loan by financing institutions such as banks and credit facilities.

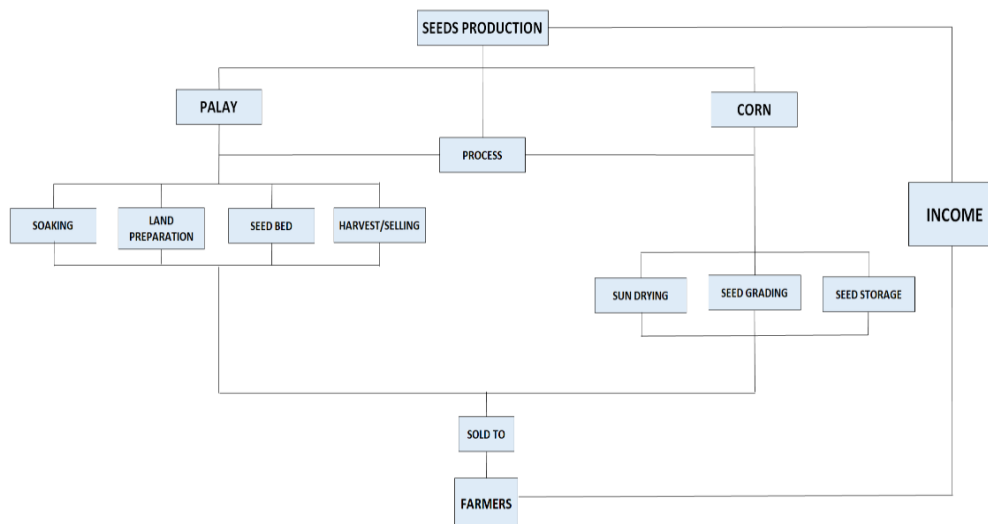


Figure 5. Seed Production Process

The rice millers can produce and sell quality seeds as another source of income. Aside from palay, they can also consider corn seeds. Around 1 million to 5 million pesos (20,000 to 100,000 USD) worth of start-up capitalization is needed depending on the area of land to be cultivated. Equipment and machineries to be used as well as the establishment of the physical store is needed for this type of business venture. To lessen the documentation costs and processes, registration as sole proprietor at the Department of Trade and Industry is necessary.

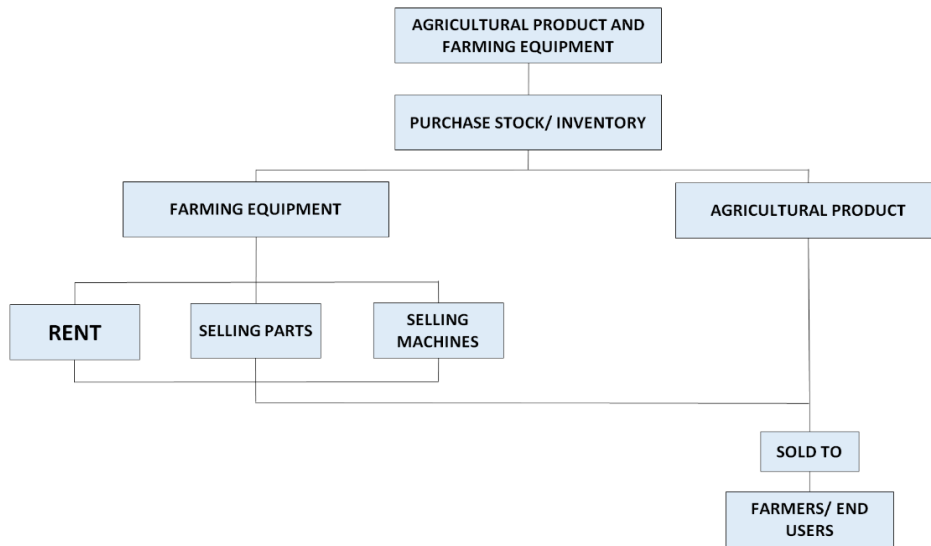


Figure 6. Agricultural Products and Farming Equipment Process

The rice millers may also engage in the sale of agricultural products such as fertilizers, insecticides, and other agri-based products needed by the farmers. Start-up capital is around 1 million pesos to 5 million pesos (20,000 to 100,000 USD). Agreements from the suppliers of agricultural products must be acquired in order to gain credit terms. In this way, it can easily bulk-up supply without paying cash.

Another activity that may be considered as another source of income is the rental of farming equipment and machineries (e.g., harvesters) and other farming tools and equipment. This will benefit the local farmers as they do not need to purchase their own farming equipment. Start-up capital is around 30 million to 50 million pesos (600,000 to 1 Million USD) due to the different costs associated with this business such as establishment of physical store which requires a wide land area for storage and display of farming equipment and machineries. Also, products to be sold are ranging from 1 million to 50 million pesos (20,000 to 100,000 USD).

From manufacturers that buy palay and sell rice, they may consider being merchandisers that import rice, sell seeds, agricultural products, and farming equipment. They can also engage in Service Industry by offering farming machineries and equipment to local farmers for rent.

Additional income generation activities mentioned may increase the income of the rice millers and allow business expansion. This will also help the labor force since increase in manpower demand also means increase in the employment rate.

Farmers may avail the rice millers' products through credit instead of availing loans from other money lenders with high interest rates. Overall economic impact may be observed due to the increased employment, increased tax to be collected from new ventures of the rice millers, and modernization of rice mill industry.

DISCUSSION

In countries like Nigeria and Uganda, analysis of the profitability of rice mills revealed great potential in the market with net present value of 27,781.52 dollars (Inuwa et al., 2011). Contributing factors include the quantity of rice mill and milling fee rate (Kikuchi, 2014). The supporting information provided by the respondents during the interview revealed that there are rice mills that do not perform formal audit but are capable of allotting budget for the equipment, and other operating costs by segregating income from circulating capital. That way, they were able to sustain business operation for couple of years.

Legally, the rice mills are allowed to pile up cavans of rice in their warehouses as long as they secure the required certification or permit to operate warehouse business. It is stipulated in Section 3B of Republic Act (RA) No. 3018 entitled, "An act limiting the right to engage in the rice and corn industry to citizens of the Philippines, and for other purposes" that, "those engaged in the milling and/or warehousing of rice and/or corn and the by-products thereof shall be allowed to continue to engage therein for a period of three years...". Therefore, as long as a miller bears a certificate and abides to the policies governing the practice, he/she is allowed to pile up cavans of rice in a warehouse.

With the guidance of the policies, the experience, and the knowledge of the rice millers, they are devising ways and strategies to increase their profit and become sustainable. A rice miller from Sta. Rosa, Nueva Ecija, a municipality in the province stated that they want to establish many retail outlets to implement the "FARM to TABLE" concept that eliminates the use of middlemen. Through it, products will be made available to consumers at their own convenience and at the lower price (Zia & Nuruzzaman, 2013). Likewise, a rice miller from San Leonardo, Nueva Ecija mentioned that they also cater to other provinces to gain additional income. Rice millers in Central Luzon usually deliver tons of rice to Metro Manila. When the market share of rice millers in the province increases, the price of rice and income increases. This is because of the additional costs allocated for the transportation and manpower.

Operations of the Rice Mills

The buying activities of the rice millers indicates that more provinces in the northern part of the country are now engaged in the rice value chain and direct purchase of palay from farmers. A rice miller from San Jose City, Nueva Ecija said that they purchase palay in bulk from traders to augment the stock that will be milled and eventually sold at higher price. Palay traders purchase newly-harvested palay from the farmers and subject them to drying before selling to the rice millers at higher price than the original. The practice allows some rice millers to operate even without drying facilities.

Rice millers in the province also supply rice to the retailers from other provinces since most residents in palay-generating areas often leave supply enough for consumption.

Challenges encountered

To conform to all requirements, one should produce a capital of 800 million pesos to 1 billion pesos each shipment (World Bank, 2014). The price of rice from other ASEAN countries as mentioned by the rice millers from San Leonardo, Nueva Ecija is around 7 to 14 pesos per kilo with each shipment ranging from 100,000 to 200,000 metric tons. Seeing that to keep pace with the importers would be impractical and costly, the rice miller in Nueva Ecija opted to focus instead on selling of local rice rather than imported one.

In order to improve the volume and thus the profit, it translates to the quality of grains. Rice millers have to use polishers that inflict mists of water. The process gives the grains shine and whiter appearance. The additional equipment required for the process translates to additional cost of production; making the price of local rice higher as compared to imported rice.

The milling capacity, warehouse capacity, and capitalization used by the rice millers in Nueva Ecija are comparable with the data given by the National Food Authority. The result not only validates the responses of the rice millers but also reveals the situation in the province and the challenges confronting the rice millers. It denotes that the government has the information and the knowledge about the situation on the ground, the plight of the Filipino farmers and those related to the rice industry. However, there is much to be done to improve this condition.

Proposed New Business Model for Rice mills

The development of new technology for food production is essential to sustain man's needs for survival (Pascual et al., 2018). With the proposed future plans and changes in the Rice Mills operations, the policies, mechanisms, technology, system, and mindset are needed for it to take effect. Rice millers can maximize resources by combining available funds. They can produce and sell quality seeds and other alternative seeds. They can

seek trainings and source out various government and non-government programs and assistance.

Strategies such as registration as sole proprietor at the Department of Trade and Industry could lessen the documentation costs and processes. Rice millers may also consider other ways to create income such as rental of farming equipment, tools, and machineries. It would increase their income as well as help the farmers by engaging in service industry.

The modified business model would support the rice millers as they increase their scope of operations and acquire necessary funding from financial institutions. Although it incurs higher cost, it will increase the income from different ventures. This expansion would benefit not only the rice millers, but the farmers, and the economy as well.

CONCLUSION

Most of the rice mills in Nueva Ecija have been in the operations for 21 years and above making them as among the oldest business industry in Nueva Ecija in the Philippines. Most of them are classified as large enterprise, with warehouse capacity of 12,000 to 100,000 cavans, capitalization of around P7 million to P300 million (140,000 to 6 Million USD) and with 21 to 25 retail outlets. They still implement traditional operations such as buying and milling palay and selling milled rice. Most of them are not yet engaged to importation and do not have other facilities such as generators and polishers. Rice millers are having problems in the importation of rice due to lack of funding; low quality of local palay; influx of imported rice that affects their income generation as imported rice is cheaper than the locally produced rice. Other problem mentioned by the rice millers was the shrinkage of rice lands due to urbanization. The modified business model will improve the income generation of rice millers while taking advantage of the newly-enacted law.

The implementation of the modified business model will help the rice millers increase their scope of operations and acquire necessary funding from banking institutions as they can present sources of repayment for the loan applied. Although the modified business model incurs more cost and capital, it will help the rice millers gain income from different ventures, allowing them to expand, grow and help the economy in the long run.

Backward integration strategy can be used in securing their own source of supply to sustain their operations. The rice millers may finance the operations of the farmers by directly buying the palay at a pre-determined price immediately after the rice crops are harvested from the farm. In this way, the farmers may have income while providing enough supply to the rice millers. Improvement of the rice milling facilities like polishers will improve the quality of local rice. It can be mixed with the imported rice to compensate the difference in terms of its cost of production and market price. Rice millers may also invest in diesel generators or rice husk power plants to supply electrical

power as alternative to crude-based electrical supply needed to run the machineries. This will cut the cost and allow rice millers to continuously operate their rice milling facilities 24/7 during harvest season without relying on the unstable electric power. Rice millers may also add retail outlets to eliminate middle men. They may hire sales officers to market the by-products of rice. Selling of rice bran to backyard hog raisers and the other by-products of rice may also help generate additional income.

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