Prospects And Challenges: Rice Tariffication Law's Influence On Region III Philippines Rice Industry

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Abstract

The control of the National Food Authority (NFA) over imports has caused the government to be responsible for its losses, which have kept farmers in poverty and made Filipinos pay more for rice. This led to the enactment of Republic Act No. 11203, also known as the Rice Tariffication Law (RTL), in February 2019. Through this, the limitations, and quotas on the amount of rice importation were lifted, in addition to the 35% import tariff put in place. This has led to a flood of low-priced rice from other countries, which benefits mostly consumers. This paper discusses how RTL affects the costs of producing rice and the earnings of local producers in Region III. The study used a quantitative method to figure out how the variables related to each other and how RTL affected the cost of inputs, the cost of labor, the cost of harvesting, the cost of post-harvesting, cost minimization, and profit maximization. A structured survey questionnaire was used to collect the data. Researchers used the descriptive type of research in this study. The results show that there is a weak but significant relationship

between how the respondents assess the costs of rice production and how the Rice Tariffication Law affects the earnings of local producers in Region III.

Keywords: Rice Tariffication Law, Region III Philippines, Rice producers, Cost Minimization, Profit Maximization.

1. Introduction

Rice is considered the staple food in the Philippines, thus playing a significant role in the economy and Filipino families from the lower income sector. The Philippines imports between 1 and 2 million metric tons of rice annually, which accounts for 10% of the total rice consumption in the country, making it the largest rice importer in the world. Due to the increased rice importation of the country mainly from Thailand and Vietnam further worsened the rice production and industry. Due to the susceptibility of the rice industry to social and political factors, critical intervention points such as agriculture policy are necessary to maintain costs, address agricultural development, and protect rice producers and consumers according to Tobias [22].

According to Palis [16] in 2020, most farmers lack the capital required to operate a rice farm. In addition, most rural farmers have found and raised concern regarding challenges brought by various document requirements to receive financial agricultural assistance. The low returns for the farmers result in a domino effect as it limits their ability to fund the necessary inputs for rice production.

In 2019, the Rice Tariffication Bill was signed by the former president Rodrigo Duterte on February 14, and it became effective on March 5 of the same year. The aim of this law is to fulfill the commitment the nation made when it entered the World Trade Organization (WTO) in 1995. Also, it allows for unlimited rice imports, considering that private sector merchants obtain phytosanitary licenses from the Bureau of Plant Industry and pay the 35% dues for shipments from Southeast Asian neighbors this agree on the study of Claret [4] in 2019.

The National Economic and Development Authority (NEDA) asserts that the rice tariffication act will benefit not only the farmers but also the poor by lowering prices and increasing

agriculture sector subsidies. Moreover, the act can ensure sufficient supply and availability of rice on the domestic market for most of the population due to the capability offered to private rice merchants to engage in the international market. Farmers are protected and given more income opportunities through the imposed tariff rates on rice imports and the preferential assistance provided to rice producers.

Nonetheless, the substantial reduction in palay prices adversely affects the living conditions of farmers. As the income of farmers continues to decline due to rising input expenses, farm gate prices also continue to decline, which further burdens rice producers. The average farm gate price for palay in 2017 was P18.21, with a P12.42 average cost of production per kilogram. Based on these figures, a farmer may earn a profit of P5.79, or a profit margin of 46.62%. Farmers will have to lower their production costs if farm gate prices decline in the upcoming years to retain the same level of profit (Balaria, Cosilet, Musa, Salagubang, & Vertudes, [18], 2020).

Evidently, the limited ability of the farmers to influence the cost of expensive supplies and equipment significantly impacted their harvest and earnings (Rebualos, J. V., Vistal, J. P., Sato, S. M. B., Cano, J. C., Camino, J. R., & Dagohoy, R. G. [18], 2021). Therefore, it is critical to evaluate how this law affects farmers' profits as well as the connection between the perspective of rice producers on the expenses associated with producing rice and the effect of RTL on regional producers' harvest.

2. Materials and Methods

Methods of Research

Quantitative research design was applied by the researchers to incorporate the data received from the research instrument into the study. Quantitative research focuses on the number of responses, which generally uses large sample sizes (Zamboni [27], 2019). In particular, the researchers utilized descriptive research to estimate the relative impact of the Rice Tariffication Law on the cost of rice production and the earnings of local producers in Region III.

The purpose of descriptive research is to define the distribution of specified variables without consideration of causality or other assumptions. This would allow the

researchers to obtain an in-depth knowledge of the respondents and give assessments of the research variables. The design was chosen due to the nature of the information to be gathered, which will only be utilized to systematically describe the data and not to influence the variables involved.

Population, Sample Size, and Sampling Technique

The local producers in Region III based on the latest RSBSA list shall be included in the study. There are 71,580 members of RSBSA around the Philippines based on the updated list on 2018 and was obtain in the official portal of Department of Agriculture. Using the Slovin's Formula, the sample size of 398 was determined. The sample size was allocated according to the population of the local producers in Region III. Simple random sampling was used as the people in the sample has an equal chance of being selected.

Description of Respondents

The relevant data for the study will be collected from three hundred ninety-eight (398) farm owners or local producers of Region III or Central Luzon. Considering the effectivity date of the Rice Tariffication Law, the population that was considered in the study consists of the local producers who started farming before March 5, 2019. Integrating this factor, the population of the study equates to seventy-one thousand five hundred eighty (71,580) local producers or farmers in Region III, which was derived from the latest Registry System for Basic Sectors in Agriculture (RSBSA) list from the Philippine Crop Insurance Corporations and published during 2018. The researchers used this information to reflect the population of the respondents in the locale.

Research Instrument

The researchers made use of a survey questionnaire to gather the data needed as part of the study. The questionnaire is composed of three (3) parts. In the first part, which is the demographic profile, the respondents are asked for their (1) age, (2) sex, (3) highest educational attainment, (4) annual

capital, (5) annual income, and lastly, (6) number of years in farming. The 10-year range in the choices in the last section is based on research conducted by Florencia Palis [16] in 2020 wherein the study assessed the socio-demographic profile of Filipino farmers. On a study conducted in 2015 by Cesar Demayo and Rosanilio Yagos [26] regarding the farmers' discernment of rice management production, it showed that a significant percentage of farmers were already farming for four years and above; hence, the option starts with 4-13 years. Also, the enactment of the Rice Tariffication Law in 2019 is also a factor considered in the first choice of 4-13 years.

On the other hand, the second and third parts assess the effects and impact of rice tariffication on (1) cost of rice production in Region III and (2) earnings of local producers. For the cost of production, the researchers made use of a 5-point Likert scale to measure the impact of the implementation of the law on various factors regarding the cost of production increase over the past three years. The factors provided are (1) the cost of input, (2) cost of labor, (3) cost of harvesting, and (4) cost of post-harvesting.

Data Gathering Procedure

The researchers utilized the use of survey questionnaires as the main tool in gathering data collection. The survey questions were checked by the research adviser, an agriculturist, and a lawyer. After it has been validated and approved, the researchers were permitted to start the data gathering. The survey links were then distributed via Google Forms through social media posting and link distribution, as well as by conducting a face-to-face survey. After the data collection has been achieved, the data gathered were tabulated and submitted to a statistician for data analysis.

Statistical Treatment of Data

After acquiring the information in the survey questionnaire, the researchers tallied, tabulated, and organized the data to analyze and interpret the findings using descriptive statistical methods. The statistical tools used to summarize and interpret

the results were the frequency distribution, the percentage distribution, the weighted mean, the Pearson Association test, the t-test and the performance scale as mentioned by Helb, Lane, Scott, Guerra, Osheron, Zimmer [7].

Table 1. Frequency and Distribution of Respondents

Demographic Variables	Frequency	Percent
Age		
20 years old	7	1.76
21-30 years old	34	8.54
31-40 years old	65	16.33
41-50 years old	111	27.89
51 years old and above	181	45.48
Total	**398**	**100**
Sex		
Male	213	53.52
Female	184	46.23
Prefer not to say	1	0.25
Total	**398**	**100**
Educational Attainment		
Elementary	93	23.36
High School	125	31.4
Postsecondary Training	40	10.05
College Degree	85	21.36
Graduate or Professional Degree	55	13.82
Total	**398**	**100**
Annual Capital		
P100,000 and below	243	61.06
P100,001 - P200,000	75	18.84
P200,001 - P300,000	29	7.29
P300,001 - P400,000	31	7.79
P400,001 and above	20	5.03
Total	**398**	**100**
Annual Income		

P50,000 and below	264	66.33
P50,001 - P100,000	71	17.84
P100,001 - P150,000	27	6.78
P150,001 - P200,000	14	3.52
P200,001 and above	22	5.53
Total	**398**	**100**
Farming Years		
4 - 13	134	33.67
14 - 23	97	24.37
24 - 33	73	18.34
34 - 43	56	14.07
44 and above	38	9.55
Total	**398**	**100**

Table 1 shows the profile of the local producers according to age, sex, educational attainment, annual capital, annual income, and number of years in farming. Three hundred and ninety-eight (398) local producers from the Central Luzon Region or Region III served as the respondents of the study. It also shows that most of the respondents (45.48% or 181 out of 398) belong to those who are 51 years old and above. The second highest percentage, which equals 27.89% was from those who belong to the age bracket of 41 to 50 years old. Next, there were 65 (16.33%) respondents and 34 (8.54%) respondents from those aged 31 to 40 years old and 21 to 30 years old, respectively. Moreover, only 1.76% or 7 of the respondents aged 20 years old.

Palis [16] (2020) stated that the average age of Filipino rice farmers was 53 years old, which is like the results of this study where the age bracket of 51 years old and above had the highest percentage. Moreover, Palis [16] abovementioned study also specified that more than half of the farmers were between the ages of 41 and 60 years old, which is resembling to the results gathered.

In terms of sex, 213 out of 398 respondents (53.52%) are male, which accounted for most of the respondents. Female respondents comprised the other 184 out of 398 respondents

(46.23%), while one (0.25%) respondent opt out to disclose their sex in completing the research instrument. These figures are also indicative of the study conducted by FAO or Food and Agriculture Organization of the United Nations (n.d.) which states that most farm activities were conducted by both sexes, with some exceptions on some tasks like those regarding on preparation of land.

In addition, 140 out of the 398 respondents had graduated from college, which is equivalent to 35.18%. Of these 140 local producers, 55 of them also had a graduate/professional degree. This is followed by those who had completed high school, which equates to 31.40% of the total respondents. Next are those who had only completed elementary school, which comprises 23.36% of the respondents and a low percentage of those who had only some form of college education and/or postsecondary training (10.05%). Acosta [1] in 2015 found that higher levels of education were associated with higher productivity in rice farming. In addition, Adriano [2] in 2014 found that farmers with at least a high school education had a 23% higher yield than those with less education as access to education is a key determinant of rice farming productivity in the Philippines. Tertiary education was also more likely to adopt modern agricultural practices and technologies, leading to higher yields and income.

Subsequently, in terms of annual capital, 243 (61.06%) rice producers in Region III have an annual capital of P100,000 and below. This is followed by 18.84% who have annual capital ranging from P100,001 – P200,000. A mere 7.79% have an annual capital of P300,001 – P400,000 and 7.29% of those ranging from P200,001 – P300,000. There were only 5.03% of the respondents who have an annual capital of P400,001 and above. According to the 2013 Costs and Returns of Palay Production report published by the Philippine Statistics Authority in 2015, the cost of producing palay in Central Luzon was on average P48,822 per ha. Cash outlays made up 49% of the overall cost of production, while imputed costs and non-cash expenses made up 33% and 18% of all expenses, respectively. In that same year, it was published by the PSA that

the average cost of production was P12.39 per kg. The average cost of producing rice in the country has already climbed by P3.13 per kg in 2022. The Philippine Statistics Authority estimated the price of producing palay at P11 as of the end of 2020.

Moreover, 264 of the respondents (66.33%) had an annual income of less than P50,000. Based on the data presented above, rice producers had a lower annual net income this year as well (2022). It is possible to argue that the expenditure incurred by the producers is responsible for their low incomes. The following 71 respondents (17.84%) reported an annual income between P50,000 and P100,000, 27 respondents (6.78%) reported an annual income between P100,000 and P150,000, whereas 22 respondents (5.53%) reported an annual income between P150,000 and P200,000. And the lowest number of respondents, 14 (3.52%), reported an annual income between P100,000 and P200,000. According to PSA's report from 2021, gross earnings amounted to a total of P68,519 per ha, while net returns were P21,430 per ha.

Lastly, in terms of the number of years in farming, 134 respondents (33.67%) claimed to have between 4 to 13 years of farming experience. The group of producers who had worked in the fields for 14 to 23 years comprised 97 responses (24.37%). Then, 73 respondents (18.34%) claimed they had been producers for 24 to 33 years. The following producers had greater farm experience: 56 respondents (14.07%) claimed 34 to 44 years of agricultural experience, while 38 respondents (9.55%) reported 45 years or more of farming experience.

Table 2 displays the impact of the Rice Tariffication Law on the costs of rice production in Region III in terms of the cost of input. Based on the data, the mean for cost of gasoline for machinery is the highest at 4.79. The cost of seeds is the lowest at 4.45. Moreover, most of the respondents experienced a severe increase in the cost of input at an average mean of 4.62

Table 2: Respondents' Assessment on the Impact of Rice Tariffication Law on the Cost of Input

Items	**Mean**	**Interpretation**
Cost of seeds	4.45	Moderate
Cost of fertilizers	4.61	Severe
Cost of pesticides	4.47	Moderate
Cost of crude oil for irrigation	4.78	Severe
Cost of gasoline for machinery	4.79	Severe
GRAND MEAN	**4.62**	**Severe**

The production costs of rice have increased, according to the Samahang Industriya ng Agrikultura, better known as SINAG (2022), and they are expected to rise further if oil prices continue to rise, which is expected given the Russia-Ukraine conflict and the high level of inflation in the Philippines. The PSA reports that the pace of commodity price hikes exceeded the target range of 2% to 4% set by the BSP for the ninth consecutive month in 2022, with inflation surging to a 14-year high of 8.1% last December, the highest since the global financial crisis's year of 2008, which was 9.1%. Moreover, the Tax Reform for Acceleration and Inclusion (TRAIN) law greatly contributes to the increasing cost of fuel due to high excise taxes imposed. An excise tax of P2.50 per liter was imposed on diesel in 2018, P4.50 in 2019, and P6 in 2020. While gasoline is getting a fuel excise of P7 in 2018, P9 in 2019, and P10 from 2020 onwards.

The RCEF will be allocated and disbursed annually, and 30% of it will be for rice seed development, propagation, and promotion that helps lessen the farmers' cost of seeds. As of January 2023, out of 230,798 seeds allocated to Central Luzon, 228,325 have already been distributed to farmers in the region. Despite this, the cost of seeds still significantly rises, and the free seed distribution is not enough for them to cover all their farmland. Some local producers cannot afford these high-priced seeds, especially the high-quality ones since their earnings have reduced due to international competition. It has dramatically

changed the policy landscape in the rice sector and generated heated debates on how it would affect food security and poverty according to Balie, Minot and Valera [3] in 2020.

Table 3 shows the impact of the Rice Tariffication Law on the costs of rice production in Region III in terms of the cost of labor. Based on the data, the mean for seedling planting, labor for fertilization and nutrient cycling, and meal allowance of laborers are the highest at 4.28. The labor for flooding and seeding is the lowest at 4.21. Moreover, most of the respondents experienced a moderate increase in the cost of labor at an average mean of 4.26.

Table 3: Respondents' Assessment on the Impact of Rice Tariffication Law on the Cost of Labor

Items	Mean	Interpretation
Labor for field preparation	4.24	Moderate
Labor for flooding and seeding	4.21	Moderate
Labor for seedling planting	4.28	Moderate
Labor for fertilization and nutrient cycling	4.28	Moderate
Meal allowance of laborers	4.28	Moderate
GRAND MEAN	**4.26**	**Moderate**

The average cost of producing rice rose by 4.52% in 2021 due to higher wage rates and fertilizer costs. This increase in agricultural wages holds back the government's mechanization program, which aims to reduce labor costs by utilizing farm machinery. In addition, palay farmers spent P10,794 per ha for hired labor in 2021, 5.4% higher than the P10,241 recorded in 2020. One of the major components of RTL is the Mechanization Component to reduce production costs using an effective and complete system of mechanized production technologies. Nevertheless, the respondents' assessment

showed that local producers still spend a lot on labor because machinery and equipment are not available. As a result of rising rice imports and trade liberalization, farmers in the Philippines would need to either increase their rice production to be competitive or look at new crops according to Dawe, Moya and Casiwan [5, 12].

Table 4 shows that the Rice Tariffication Law (RTL) had the most impact on the cost of hauling rice with a mean of 4.35 while harvesting machinery and equipment has the lowest with 4.02 in terms of cost of labor.

One of the objectives of the Rice Competitive Enhancement Fund (RCEF) was to allocate 50% of the annual rice fund to RCEF-Mechanization Component to provide appropriate agricultural machinery and postharvest facilities to eligible and registered rice-based farmer's cooperatives and associations (FCAs) or Local Government Units (LGUs) but the results show that local farmers are still experiencing a moderate increase in terms of cost of harvesting machinery and equipment.

Table 4: Respondents' Assessment on the Impact of Rice Tariffication Law on the Cost of Harvesting

Items	Mean	Interpretation
Harvesting machinery and equipment	4.02	Moderate
Harvesting tools and supplies	4.13	Moderate
Labor for harvesting	4.32	Moderate
Cost of hauling rice	4.35	Moderate
GRAND MEAN	**4.21**	**Moderate**

Rural solar electrification is seen as a solution to further help the local producers in lowering the costs for machinery maintenance and facilities by including this to the RCEF's goals which was proven helpful in the agriculture sector in India wherein water pumping is mainly sourced from solar electricity.

Table 5: Respondents' Assessment on the Impact of Rice

Tariffication Law in terms of Cost Minimization

Items	Mean	Interpretation
Cost of Milling	4.17	Moderate
Cost of Threshing	4.3	Moderate
Cost of sales and marketing	3.99	Moderate
Labor for post-harvesting	4.2	Moderate
GRAND MEAN	**4.17**	**Moderate**

Table 5 depicts that the Rice Tariffication Law had the most impact on the cost of threshing with a mean of 4.30, in terms of the cost of post-harvesting, which means that costs of running and acquiring machinery have increased. On the other hand, the cost of sales and marketing is the lowest at 3.99.

According to the data reflected in the Table 7 above, the Rice Tariffication Law (RTL) has only had a mild effect which was reflected at 2.14 on local producers' cost minimization, with "free distribution of inbred certified seed and fertilizers" ranking the highest out of the five presented, receiving a weighted mean of 2.88 and "access to rice storage and drying facility" garnering the lowest with a weighted mean of 1.70. The Department of Agriculture (DA) reports that more than one million rice farmers have received over 8.6 million bags of certified inbred rice seeds since RTL's enactment, but only about half of the local farmers have received free seeds and fertilizers. Furthermore, almost 71% of the respondents do not have access to drying facilities, and even with RTL's support, mechanical dryers are usually not available, leading to poor-quality dried paddy due to the use of pavements or solar dryers. In terms of the degree of technological usage, including machinery and automation, agricultural production methods vary between industrialized and developing countries as stated in the study of Marinoudi, Sorensen, Pearson, and Bochtis [8] in 2019.

Table 6: Respondents' Assessment on the Impact of Rice

Tariffication Law in terms of Cost Minimization

Items	Mean	Interpretation
Free distribution of inbred seed and fertilizer	2.88	Mild
Free training in the development of rice crops, modern rice farming methods, seed production, or farm mechanization	2.18	Very Mild
Free use of rice farm machinery and equipment	1.95	Very Mild
Expanded rice credit assistance made with minimal interest rates and minimum collateral requirement	2	Very Mild
Access to Rice Storage and Drying Facility	1.7	Very Mild
GRAND MEAN	**2.14**	**Very Mild**

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This is mainly due to high fuel costs and a lack of knowledge about mechanical drying technology.

Table 7: Respondents' Assessment on the Impact of Rice Tariffication Law in terms of Profit Maximization

Items	Mean	Interpretation
The implementation of the rice tariffication law significantly increased average palay production.	1.9	Very Mild
Rice harvested are sold immediately as it became LGUs priority to buy domestic rice.	2.08	Very Mild
Rice harvests are sold immediately since lower rice prices have made it more affordable for many individuals to buy in bulk.	2.46	Very Mild
Palay prices increased after the enactment of the Rice Tariffication Law.	1.85	Very Mild
GRAND MEAN	**2.07**	**Very Mild**

Table 7 presented above shows how the Rice Tariffication Law affects the profits of local rice producers. "Rice harvests are sold immediately because lower rice prices have made it more affordable for many individuals to buy in bulk" is the factor that most likely maximizes profit, with a weighted mean of 2.46, while "Palay prices increased after the enactment of the Rice Tariffication Law" has the least chance of maximizing profit with a weighted mean of 1.85. Overall, the average weighted mean for all indicators is 2.07, indicating a mild effect of the law on profit maximization. The Rice Competitiveness Enhancement Fund (RCEF) aims to increase palay production to five MT per hectare up from 3.64 MT per ha in 2019, and farmers' income by 30% for those using RCEF facilities.

However, respondents reported only minor changes in the factors that increase local producers' income, after three years of the law's implementation. In the first year, the law had adverse effects on rice producers, contradicting the predictions of its proponents. The law lowers rice producer and consumer prices, which affects households on both sides. The poorest income brackets have favorable effects, while the richest brackets are either unchanged or marginally worse off, causing adverse effects on rice producers. Movements in real interest rates also significantly explain fluctuations in food prices according to Taghizadeh-Hesary, Rasoulinezhad and Yoshino [20] in 2019.

Table 8: Relationship between Cost of Input and Impact of Rice Tariffication Law on the Earnings of Local Producers in Region III

Correlation Coefficient (r)	-0.2367
Correlation Interpretation	Weak Correlation
Sample Size	398
Test Statistic	-5.4411
P-Value	0.0000
Interpretation	Significant

Table 8 demonstrated above shows a weak negative correlation (-0.2367) between the earnings of local producers in Region III and the cost of inputs, such as seeds, fertilizers, pesticides, crude oil for irrigation, and gasoline for machinery. A p-value of 0.0000, which is less than the significance level of 0.05, indicates that the cost of inputs is significant in determining the level of earnings for local producers. High production costs force local rice producers to lower the price of their rice, leading to decreased income as they cannot compete with countries like Thailand and

Vietnam that have lower production costs. According to reports of BPI in 2021, Vietnam is the top supplier of imported rice, accounting for 82% of the total volume at 2.46 million MT,

followed by Myanmar with 203,879.28 MT and Thailand with 150,416.37 MT. Low income from high input costs discourages local producers from harvesting, and if the government does not address this issue, it could lead to a rice crisis according to Mendoza[9].

Table 9 shows that there is a weak negative correlation (-0.1604) between the assessed impact of RTL on the earnings of local rice producers in Region III and the cost of labor, which implies that a higher cost of labor results in lower earnings. While the relationship is significant, the p-value of 0.0013 indicates that it is very weak.

Table 9: Relationship between Cost of Labor and Impact of Rice Tariffication Law on the Earnings of Local Producers in Region III

Correlation Coefficient (r)	-0.1604
Correlation Interpretation	Very Weak Correlation
Sample Size	398
Test Statistic	-3.2332
P-Value	0.0013
Interpretation	Significant

The high cost of producing palay in Nueva Ecija, a province known for its high-yield rice production in the Philippines, is due to the high labor requirement in manual transplanting, harvesting, and threshing according to a study by Jino Nicolas in 2017 titled "Rice farming can be profitable". This is in contrast to neighboring countries like Vietnam, which uses direct seeding and combine harvesters resulting in higher productivity and efficiency. Despite the promise of the Rice Tariffication Law through the Rice Competitiveness Enhancement Fund (RCEF) to enhance the competitiveness of the Philippine rice industry through farm mechanization, the cost of labor for producing local rice in 2021 remained high compared to neighboring countries. One million farmers were supposed to receive 15

billion worth of farm machinery and equipment (DA Communications Group, 2021), but the results of the study show that this was not materialized, and the Philippines is still lagging behind in terms of reducing production costs compared to our other neighboring countries as the cost of labor for producing local rice in 2021 was P12.72 per kg compared to P6.22 per kg in Vietnam and P8.86 per kg in Thailand. The government carries out this mandate through the RCEF, which is the collecting of rice import tariffs. When RTL is put into effect, RCEF is required to have an automatic fund of P10 billion every year until 2024, Miraflor [10] in 2021.

Table 10 demonstrates relationship between the cost of harvesting and the impact of RTL on the earnings of local producers. The study found that there is a negative correlation (-0.1175) between the cost of harvesting and the impact of RTL on earnings but is very weak. This indicates that there is an inverse relationship between these two variables. Crop establishment method significantly affects the amount of seed used per square meter. While direct seeding is more costly, it also saves time and money. Larger data sets should be utilized to examine the overall impact on farm profitability and production costs. Although transplanting is still the most popular technique in the Philippines for crop establishment, there are lessons to be learnt from other nations on how to utilize fewer seeds and produce rice more economically

Table 10: Relationship between Cost of Harvesting and Impact of Rice Tariffication Law on the Earnings of Local Producers in Region III

Correlation Coefficient (r)	-0.1175
Correlation Interpretation	Very Weak Correlation
Sample Size	398
Test Statistic	-2.3544
P-Value	0.0190
Interpretation	Significant

Table 11 presents how the RTL has affected local farmers' post-harvest earnings. It shows that a weak negative correlation (-0.2385) exists between cost of post-harvesting and the impact of RTL on the earnings of the local producers. The negative correlation indicates that when post-harvesting costs are high, then the impact of the RTL on earnings of the local producers is low. In other words, the cost of harvesting and the impact of RTL on the earnings of the local producers have a significant relationship but has a minor impact on the earnings of Region III's local producers. Although the technologies have a wide range of efficiency scales, systems of components operating at specific locations are highly desirable, especially at the farmer level where economic considerations are more important as mentioned by Tallada [21] in 2019.

Table 11: Relationship between Cost of Post-Harvesting and Impact of Rice Tariffication Law on the Earnings of Local Producers in Region III

Correlation Coefficient (r)	-0.2385
Correlation Interpretation	Weak Correlation
Sample Size	398
Test Statistic	-4.8868
P-Value	0.0000
Interpretation	Significant

In RTL's entire six-year term, RCEF seeks to reduce production costs by P2 per kg to P3 per kg and postharvest losses by 2–3%. According to Yacub [23] post-harvest losses of agricultural products in the Philippines represent a significant loss of 10-50% of production output in developing nations. This indicates that 10-50% of all the resources used to manufacture the goods are wasted. The Priorities and Constraints of Post-Harvest in the Philippines also states that there are several constraints in the local post-harvest industry which can effectively limit the benefits that can be derived from them. Furthermore, the inability of producers to sort their

commodities according to size and quality results in multiple handling and, as a result, greater loss.

Table 12: Relationship between respondents' assessment on the costs of rice production and the impact of Rice Tariffication Law in terms of Cost Minimization

Correlation Coefficient (r)	-0.1847
Correlation Interpretation	Very Weak Correlation
Sample Size	398
Test Statistic	-3.7402
P-Value	0.0002
Interpretation	Significant

Table 12 depicts the relationship between the costs of rice production and the impact of the Rice Tariffication Law in terms of cost minimization. The study found that there is a negative correlation (-0.1847) between the two variables, indicating that rice prices fall when production costs rise and vice versa. It has a significant relationship but a very weak correlation as the p-value, which was calculated at 0.0002, is less than the level of significance of 0.05. The RTL generated P46.6 billion in rice import duties in the first three years of its implementation, directly benefiting palay farmers through a P10 billion annual fund. According to Karl Chua, Socioeconomic Planning Secretary of NEDA, all the P18.9 billion tariff collections from 2022 were given to the farmers as part of RTL's goal of minimizing the production cost. However, according to the respondents' assessment, the local farmers continue to face rising production costs even after the implementation of the law. Based on the data shown by PSA, the average cost of producing palay last 2021 increased to P12 per kg. It was the highest palay production cost since 2014. The increase in total costs incurred by palay farmers outpaced the 1.57% annual increase in gross revenues per hectare.

Table 13: Relationship between Respondents' Assessment on the Costs of Rice Production and the Impact of Rice Tariffication Law in terms of Profit Maximization

Correlation Coefficient (r)	-0.2671
Correlation Interpretation	Weak Correlation
Sample Size	398
Test Statistic	-5.5158
P-Value	0.0000
Interpretation	Significant

Table 13 demonstrates the relationship between the costs of rice production and the effect of the Rice Tariffication Law in terms of the profit maximization of the local producers. The results of the study gathered from the respondents showed that there is a negative weak correlation (-0.2671) between the aforementioned variables. This means that there is an inverse, but weak relationship between the variables. Furthermore, there is a significant relationship between the variables because the calculated p-value of 0.0000 was less than the 0.05 value for the level of significance. Maximizing profit is one of the objectives of the local producers in their pursuit, in which the optimal output and pricing levels are both the key variables. Khondoker, Mottaleb and Samarendu [11] in 2015 claims that rising input costs and agricultural wage rates have been decreasing overall profitability, which has created disincentives for rice growers. The same study also noted that because small farms require more manpower and other inputs than large farms do, in order to generate higher rice income and profit, the loss in profitability is typically greater for small farms than for large ones. This implies that even after the implementation of the RTL, the impact of the law remained at a disadvantage for the local producers in terms of their increased production costs and decreasing profit.

3. Conclusions and Recommendations

Based on the preceding findings, the following conclusions

were drawn:

1. Most of the respondents present a greater possibility that they are not leaning more on technological advancements apparently offered under the RCEF through one of its key programs, rice farm machinery and equipment. Furthermore, numerous criteria and technical requirements are necessary for the eligibility of the farmers for the subsidies granted by the provisions of the RTL, which can be tedious on their part as various resources are needed, like the time and costs they will allot for requesting these.
2. Local producers are hesitant to invest more because of the low level of returns they have earned related to the capital they invest. The costs of input for farming are also affected by inflation, and the producers' market share became limited because of the presence of more rice imports, preventing them from maximizing their income. Furthermore, inherent risks related to farming itself, like catastrophic events, climate crisis, and production risk also pose as probable reasons for the low amount of capital utilized by the local producers.
3. The cost of crude oil for irrigation and the cost of gasoline for machinery are highly affected by the overall increase in fuel prices in the Philippines due to inflation and excise taxes. In addition, local producers still must pay higher prices for seeds despite the free seed distribution provided by RCEF, so they opt to purchase and use ordinary seeds instead of high-quality ones.
4. The researchers believed that RCEF's goal of farm mechanization to reduce labor costs was not fully materialized as it is being constrained due to small-sized and inaccessible rice fields and abundance of rural labor. It will not be possible for our local producers to be competitive in rice production in terms of high yield if the cost of labor is not reduced due to insufficiency of integration of modern rice technology, which will result in a bigger labor differential and cost disadvantage in

comparison to our neighboring and rice-exporting countries like Vietnam and Thailand.

5. The researchers concluded that the rise in fuel and electricity increases the cost of labor in transporting rice and other maintenance costs. A strong connection between local producers and the market is also lacking, which limits the opportunity for producers to increase their income because merchants and benefit greatly from it.
6. Due to the high demand for rice, imported rice is cheaper than local rice, making it hard for local farmers to compete, thus lowering local rice prices. The policy reform decreases the price of rice, which is favorable to most households as they are net purchasers of rice. However, because of declining rice prices, the law has an adverse impact on the profits of local rice producers. The country's rice supply could be impacted by farmers' decisions to maintain rice production in the face of falling farmgate prices.

The researchers made the following recommendations after thorough evaluation and considering the foregoing findings based on the conclusion drawn.

1. A portion from the Rice Fund may be allocated to the LGUs to reach greater inclusivity to remote or rural areas about the programs of the RCEF and the eligibility criteria for its subsidies. Awareness of the details of the program can aid the local producers in maximizing the various benefits specified under the RCEF. Moreover, the process of requesting for requirements of the local producers may be revisited by the local government units of the region by conducting efforts to extend awareness and accessibility about these processes to its intended beneficiaries.
2. The local producers should maximize their participation in the Rice Competitiveness Enhancement Fund - Rice Extension Service Program (RCEF-RESP), where the Agricultural Training Institute (ATI), Technical Education and Skills Development Authority (TESDA), PhilRice, and PhilMech offer training and strategic communication

services to help them understand the scientific principles of rice farming and improve their decision-making capacity.

3. Farmers' cooperatives and associations (FCAs) may initiate talks with their LGUs to enter into a marketing agreement with the National Food Authority to ensure that the agency assists the local producers in marketing their product by linking them with prospective buyers who can offer them a higher price. It could also include buying more palay from local farmers to push them to increase local production as rice imports in the country continue to rise. If the volume were overseen, the farmgate prices and the earnings could be compelling for the local producers to invest higher capital, which in turn, generates higher yields for the needs of the consumers.
4. For the gasoline and electricity costs concerns, the Department of Energy can have an active participation in the RCEF Mechanization Program's future renewable energy goals. Rural solar electrification may be studied regarding its feasibility in reducing the cost of agricultural mechanization and rice harvesting, and price. Through maximizing the use of renewable energy in the Philippines, this will significantly lead farm owners in attaining greater levels of technology-driven productivity at lower costs.
5. Local producers are recommended to join in cooperatives to engage in programs offered in RCEF Mechanization Component that enhances local rice producers' access to suitable postharvest and production technology and equipment through DA-accredited cooperatives. With the help of intensive technological development, fabrication, and manufacturing, the local agricultural machinery manufacturing industry will be strengthened.
6. Cooperatives are encouraged to utilize the credit assistance program offered by RCEF. These organizations can offer lower interest rates to local producers, which can help them fund their agricultural expenditures.
7. The RCEF-Rice Extension Services Program (RCEF-RESP) is suggested to expand existing programs such as farm schools and cooperate with more cooperatives on

enterprise development to increase the competitiveness and income of local producers. Additionally, reasonable incentives, which may include immediate compensation (e.g., seeds or fertilizers) every after-training attendance, can be allotted through the services program to push more local producers to participate in the series of trainings.

8. For future researchers, the ideas presented may be used as a reference for future studies that may be related to this research. This study will also serve as their cross-reference, providing them with background information or an overview of the impacts of the Rice Tariffication Law on costs of rice production and local producers' earnings. As it was presented in this study that credit assistance plays a big role in local producers sought for capital, they could also identify the impact of the RTL on different elements like cooperatives and other financial institutions. They could also tap into LGU's perspectives on the initiatives they could employ to help local producers achieve better yields. Lastly, they could also measure the perceived success of the law after six years of being signed into law as the yearly funding of P10 billion through RCEF will run for six years that started in 2019.

REFERENCES

[1] Acosta, Z. (2019, September 6). Imported rice are more common now than ever-to the detriment of our rice farmers. NOLISOLI. Retrieved May 7, 2022, from https://nolisoli.ph/67124/rice-liberalization-law-zacosta-20190906/

[2] Adriano, F. (2022, March 24). Rice tariffication law: Three years after. The Manila Times. Retrieved May 16, 2022, https://www.manilatimes.net/2022/03/24/business/agribusiness/ricetariffication-law-three-years-after/1837336.

[3] Balié, J., Minot, N., & Valera, H. G. A. (2020, December 8). Distributional impacts of the Rice tariffication policy in the Philippines. Economic Analysis and Policy. Retrieved May 16, 2022, from

https://www.sciencedirect.com/science/article/pii/S0313592620304525/.

[4] Clarete, R. (2019, September 25). Finding our balance in modernizing our rice industry. Per SE. Retrieved February 5, 2023, from https://econ.upd.edu.ph/perse/?p=7448.

[5] Dawe, D. C., Moya, P., & Casiwan, C. B. (Eds.). (2006). Why does the Philippines import rice?: meeting the challenge of trade liberalization. Int. Rice Res. Inst. p. 3-7.

[6] De Lima, D. V. M. (2011). Research Design: A Contribution to The Author. Redalyc.Org. https://www.redalyc.org/articulo.oa?id=361441674011.

[7] Hebl, M., Lane, D., Scott, D., Guerra, R., Osherson, D. & Zimmer, H. (2013). Introduction to Statistics, Online Statistics Education, 9(1), 694, doi:10.5038/1936.4660.9.1.9.

[8] Marinoudi V., Sorensen C.G., Pearson S. and Bochtis D. (2019). Robotics and labour in agriculture. A context consideration. Biosystems Engineering, 184: 111-121.

[9] Mendoza T C 2002: Comparative productivity, profitability and energy use in Organic, LEISA and Conventional rice production in the Philippines. Livestock Research for Rural Development. Volume 14, Article #57.

[10] Miraflor, M. B. (2021, October 31). Rice farmers urgently asking for dryers. Manila Bulletin. Retrieved January 14, 2023, from https://mb.com.ph/2021/10/31/rice-farmers-urgently-asking-for-dryers/.

[11] Khondoker Abdul Mottaleb & Samarendu Mohanty (2015) Farm size and profitability of rice farming under rising input costs, Journal of Land Use Science, 10:3, 243-255, DOI: 10.1080/1747423X.2014.919618.

[12] Moya PF, Bordey FH, Beltran JC, Manalili RG, Launio CC, Mataia AB, Litonjua AC, and Dawe DC. 2016a. Costs of Rice Production. In Bordey FH, Moya PF, Beltran JC, Dawe DC, editors. Competitiveness of Philippine Rice in Asia. Science City of Munoz (Philippines): Philippine Rice Research Institute and Manila (Philippines): International Rice Research Institute. pp. 99-118.

[13] Nicolas, J. (2017, July 31). Rice farming can be profitable. BusinessWorld Online. Retrieved January 18, 2023, from https://www.bworldonline.com/opinion/2017/08/01/20868/rice-farming-can-profitable/.

[14] Ocampo, K. R. (2020, February 14). Ph still world's biggest rice importer. INQUIRER.net. Retrieved February 7, 2023, from https://business.inquirer.net/290438/ph-stillworlds-biggest-rice-importer.

[15] Oxfam International. (2019, March). Unfair Harvest: The state of rice in Asia. Oxfam GB. https://doi.org/10.21201/2019.4184.

[16] Palis, F. (2020). Aging Filipino Rice Farmers and Their Aspirations for Their Children. Philippine Journal of Science. Retrieved May 14, 2022, from https://philjournalsci.dost.gov.ph/images/pdf/pjs_pdf/vol149no2/aging_filipino_ rice_farmers_.pdf.

[17] Patil, B. (2019, June 6). Importance of Seed/Planting Material in Crop production. Research Gate. Retrieved January 16, 2023, from https://www.researchgate.net/publication/334273419_Importance_of_SeedPlanting_Material_in_Crop_Production.

[18] Rebualos, J. V., Vistal, J. P., Sato, S. M. B., Cano, J. C., Camino, J. R., & Dagohoy, R. G. (2021). Rice Tariffication Law through the Lens of the Farmers: A Case in the Municipality of Carmen. International Journal of Research and Innovation in Social Science, 05(08), 195–203. https://doi.org/10.47772/ijriss.2021.5813.

[19] Rosegrant, M. W. (2010). Rice Price Crisis: Causes, Impacts, and Solutions. AgEcon Research. Retrieved February 6, 2023, from https://ageconsearch.umn.edu/record/199086/files/AJAD_2010_7_2_1Pande y.pdf.

[20] Taghizadeh-Hesary, F., Rasoulinezhad, E., & Yoshino, N. (2019, February 8). Energy and Food Security: Linkages through price volatility. Energy Policy. Retrieved February 26, 2023, from https://www.sciencedirect.com/science/article/pii/S0301421518308486.

[21] Tallada, J. G. (2019, August). Precision agriculture for rice production in the Philippines. In International Workshop on ICTS for Precision Agriculture (p. 79).

[22] Tobias A, Molina A, Valera HG, Mottaleb KA, Mohanty S. 2012. Handbook on rice policy for Asia. Los Baños (Philippines): International Rice Research Institute. 47 p.

[23] Vertudes, M. F., Musa, C. D., Cosilet, M. A., Salagubang, R., & Balaria, F. (2020). Impact of Rice Tariffication Law in selected Rice Farmers in NuevaEcija, Philippines. International Journal of Advanced Engineering, Management and Science, 6(3), 147–153. https://doi.org/10.22161/ijaems.63.7.

[24] Yacub, C. A. (2019, April 6). Rice tariffication law still protects farmers. Retrieved from https://opinion.inquirer.net/120589/rice-tariffication-law-still-protects-farmers.

[25] Yagos, R., & Demayo, C. (2015, January). Farmer's Perceptions on Rice Production Management. https://www.researchgate.net/figure/Number-of-years-farmersengaged-in-farming_fig2_305956405.

[26] Zamboni, J. (2019, March 2). The Advantages of a Large Sample Size. Sciencing.https://sciencing.com/advantages-large-sample-size-7210190.html.