



Income and Expenditure Analysis of Selected Lowland Rainfed Rice Farmers in Tubog, Cawayan, Masbate

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Abstract: This study investigated the rice income and expenses of lowland rain-fed farmers in Barangay Tubog to ascertain whether these farmers could generate profits. A survey questionnaire was utilized to collect the data. The findings indicated that rice farmers earned an average annual income of P11,571.43. Conversely, their agricultural costs amounted to an average of P15,681.68 per cropping season. The study revealed that farmers needed more awareness regarding the recommended fertilizer application rates for a given farm area. Consequently, they incurred higher expenses on inputs, which harmed their income. Specifically, the average total cost of land preparation was found to be P3,084.09. The labor cost averaged P3,050.00, while the total expenses on fertilizer per cropping season averaged P5,812.42. Furthermore, the average total cost of pesticides per cropping season was approximately P1,258.42, and the average total milling cost amounted to P1,756.75. Overall, the entire agricultural expenses averaged P15,681.68 per cropping season. In terms of household expenses, the average was calculated to be P12,626.47. The researchers discovered that lowland rain-fed rice farmers in Barangay Tubog incurred higher expenses while generating lower income due to limited production output. This is likely due to some factors, including outdated farming practices, lack of access to credit, and the high cost of inputs. These findings suggested a need for government intervention to support lowland rain-fed rice farmers in Barangay Tubog. This could include providing farmers access to improved farming technologies, credit, and market linkages.

Keywords: Expenditure; income; inputs; lowland; rain-fed

1. Introduction

Agriculture is crucial to society because it sustains the local economic system. Also, it offers a large percentage of the population opportunities for employment [1]. Based on the data from Trading Economics [2], workers in the service sector share 58.8 percent of the total employment in the Philippines, followed by agriculture, which shares about 22.5 percent as of 2021. Agriculture is one of the primary sources of income for most Filipinos. 13.73 percent of the total population is the labor force in agriculture, composed of the farming and fishing sub-sector [3].



For most Filipinos, rice is their primary food source and staple crop. 2.5 million families, or 2.1 million farmers, are employed in the rice industry [4]. Rice output in the nation grew between 2018 and 2020, rising to 19.32 million metric tons in 2020 from 19.07 million metric tons in 2018, indicating an average annual rise of 0.7 percent. Central Luzon continuously produced the most rice from 2018-2020, with 19.0 percent of the national annual rice produced or 3.62 million metric tons or 18.8 percent. Irrigated farms, which accounted for 68.5 percent of the total harvest area in 2018, 70.1 percent in 2019, and 68.9 percent in 2020, provided most of the harvest areas across the three years. The share of the rain-fed regions dropped from 29.3 percent in 2018 to 28.8 percent in 2020. In upland farms, harvest areas ranged from 2.0 percent to 2.20 percent in 2018-2020. The Bicol region ranked fifth, having produced the most rice in 2018, amounting to 1.35 million metric tons or 7.1 percent of the share total, ranked sixth in 2019, amounting to 1.19 million metric tons or 6.3 percent, and ranked fifth in 2021, amounting to 1.29 million metric tons or 6.7 percent [20]. Farming is a good source of income; some even get rich because of entering this sector. The average net return for rice farmers is P16,832.00, earning P140.00 for every P100.00 spent. A farm with ten (10) hectares can expect a net income of P 600,000.00 to P 800,000.00 per year [5].

Due to some factors, especially the expenses and demand of the farm, there are some effects on the farm's income. Seeds, fertilizers, pesticides, and labor utilization are some of the most significant expenses the farmers need to provide for the demand of their farms. In rice production, the average quantity of seeds was estimated at 91.94 kilograms. Fertilizer averaged 214.76 kilograms per hectare for inorganic and 11.52 kilograms for organic. The usage of pesticides ranged from 0.03 liters for fungicides to 0.82 liters for insecticides, and the average labor utilization was 61.61 man-days per hectare [6]. But in 2013, the average variable costs of producing rice amounted to P35,675 per hectare or 85 percent of the total cost; 32 percent of the total variable cost was labor, and 15 percent averaged, or P6,386 per hectare, is the fixed cost. In irrigated farms, the average cost of production was P46,513 per hectare, while P33,888 per hectare in non-irrigated farms. There were P20,688 net returns in irrigated rice farms and P9,755 per hectare in non-irrigated rice farms, considering the cash and non-cash expenses of the farms [7]. Based on the recent data of the Registry System for Basic Sectors in Agriculture (RSBSA), there are 179 registered farmers in Tubog, Cawayan, Masbate; 36 of these are just registered but do not engage in farming, and five farmers transfer to nearby municipalities.

Nowadays, farmers do not just focus on one income source but tend to enter other jobs to support their household expenses. According to Hartoyo & Shara [4], the higher the household income, the higher the household expenditure. According to PhilRice, farmers' income depends on the farm yield, labor cost, and farm inputs. The objectives of this study are to (1) Determine the demographic profile of the farmers in Tubog, Cawayan, Masbate; (2) Determine the income of lowland rain-fed rice farmers in Tubog, Cawayan, Masbate; (3) Determine the household and agricultural expenditure of lowland rain-fed rice farmers in Tubog, Cawayan, Masbate, and how it influences the income received by the farmers; (4) To determine whether or not the farms are profitable. There is no significant problem regarding their incomes;

2. Methodology

2.1 Research Design and Sampling

The present study employed a descriptive research approach, aiming to provide a comprehensive description of a specific population's characteristics. Descriptive research gathers data that enables the investigation of various aspects related to the "what," "when," and "how" questions concerning a particular population or group [8]. Data collection involved observations within the research area and structured interviews with the respondents using questionnaires. The study focused on 44 actively engaged lowland rainfed rice farmers in Tubog, Cawayan, and Masbate. The selection of this area was based on the presence of active farming activities and its suitability for the study's objectives. The sample group comprised lowland rice farmers residing in Barangay Tubog, Cawayan, and Masbate. The researchers employed Slovin's formula to calculate this study's required number of respondents. With a population size of 1,265, the researchers determined the appropriate sample size considering the desired percent margin of error, resulting in a sample of 44 respondents. Respondents were selected based on their suitability for providing the sought-after information. Convenience sampling, a non-probability sampling technique, was utilized, whereby the sample units were selected based on the researcher's ease of access [9].

2.2 Data Collection and Statistical Analysis

The data collection process involved a structured questionnaire to gather relevant participant information. The questionnaire was carefully constructed to capture key aspects such as the farmers' sources of income, estimated annual income, production practices, production volume, and estimated expenses. Using a structured questionnaire, the researchers aimed to ensure consistency in data collection and facilitate systematic information collection. The questionnaire was administered to 44 lowland rainfed rice farmers in Barangay Tubog, Cawayan, Masbate. The researchers chose this sample size based on applying Slovin's formula, which considers the desired percent margin of error and the total population size of 1,265. This sample was considered representative of the larger population of interest. The researchers conducted face-to-face interviews, following a structured approach, to gather the required data. This approach allowed for further clarification of questions and ensured that respondents provided accurate and complete responses. The interviews were conducted consistently to minimize potential biases or variations in data collection. After the data collection, the researchers proceeded with the statistical analysis of the collected data. Descriptive statistics were employed to summarize and describe the key variables of interest. Frequency counts were used to determine the number of occurrences of specific responses or categories within each variable. Percentages were calculated to express the proportion of respondents who provided particular answers or fell into specific categories. Mean values were calculated to give an average representation of numerical variables, such as estimated annual income or production volume. These descriptive statistics allowed the researchers to gain insights into the characteristics, patterns, and trends present within the collected data.

3. Results and Discussion

3.1 The Characteristics of Farmer Respondents

The characteristics of farmer respondents in this study were sexual identity, quantity of families, marital status, level of education, and employment status. Based on the data gathered, most farmers were male (52%) and were the head of the family, responsible for cultivating the land to provide food for their families. It is consistent with Velza et al.'s study that the male does the direct farming operation [10]. The same table (Table 1) shows that 39% of the households had between one and three children, 43% had four to six children, 16% had seven to nine children, and 2% had ten or more children. It was noted that the average number of persons in a household was 4.2; number of household members is one of the determinants of the ability of the family to support their members in all aspects of their needs; thus, it is necessary for the farmers to carefully plan their family size base on their financial ability [11]. Moreover, the size of the farmers' families influenced their expenditures, and if the size of a family is large, its expenses will be higher [12].

Based on the marital status, 98% of the farmers were married, while 2% were widows. Regarding education, 68% of the farmers were elementary graduates, 14% completed secondary education, 11% had incomplete primary education, and only 3% reached high school. The lack of formal education among farmers may impact their productivity, particularly in adopting modern agricultural technologies [13]. Low education levels, large family size, and limited access to agricultural inputs were identified as factors affecting rice production [14]. Thus, providing informal education, such as training and seminars, could help improve farmers' knowledge and encourage the adoption of new technologies [15]. Regarding farming experience, 39% of farmers had cultivated their land for 11-20 years, followed by 16% farming for 0-10 years. Additionally, 14% of the farmers had dedicated 41-50 years to agriculture, while 11% had experience ranging from 31-40 and 51-60 years. Only 9% of the farmers had been farming for 21-30 years. The length of farming experience is one of the determinants of the success or failure of farming; thus, farmers must gain more experience and insights in their agriculture to learn more and be more productive. Regarding the farm size, most farmers (57%) had a farm size of 1-3 hectares, with an estimated average rice harvest of 19.8 sacks per year. The farmers' yield from their production is much lower because, according to PhilRice [16], an average yield of 3.29 metric tons of rice is expected per hectare. The study identified 16% of the farmers as small, while others were considered significant, with land holdings of 4-10 hectares or more. It was found that larger farms tend to generate higher income [14], and the size of the farm is a key factor affecting the farmer's income; moreover, economic of scale is one of the limiting factors for economic production in rice farming and in this location, it seems that agronomic production (rice) is small. [18]. Regarding farming capital, 57% of the farmers borrowed

money from various sources, while 43% used their funds to support rice production. Regarding land ownership, 57% of the farmers owned their land, 30% were tenants, and 14% rented the land for agricultural activities.

In general, the characteristics of farmer respondents, including their family size, marital status, education level, farming experience, farm size, capital sources, and land ownership, were identified in this study. These characteristics are significant in farmers' decision-making processes and overall farming activities. The findings highlight the need for educational interventions and support to enhance farmers' knowledge and productivity, particularly in adopting new technologies.

Table 1. Socio-demographic profile of farmers in barangay Tubog

Variable	Frequency (44)	Percentage (%)
Gender		
Male	23	52
Female	21	48
Number of children		
1-3	17	39
4-6	19	43
7-9	7	16
10 and above	1	2
Marital Status		
Single	0	0
Married	43	98
Separated	0	0
Widow	1	2
Educational attainment		
Graduate of Elementary	30	68
Primary level	5	11
Secondary Level	3	7
Graduate of high school	6	14
Occupation		
Farming	44	100
Year in farming		
0-10 years	7	16
11-20 years	17	39
21-30 years	4	9
31-40 years	5	11
41-50 years	6	14
51-60 years	5	11
Farm size		
Below 1 ha	16	36
1 ha – 3 ha	25	57
4 ha – 9 ha	2	5
Above 10 ha	1	2
Sources of capital in farming		
Borrowed	25	57
Owned	19	43

System of Land Ownership		
Owned	25	57
Tenant	6	14
Rented	13	30

3.2. Economic Analysis of Agricultural Production

The analysis of farmers' yields and income on their rice production is shown in Table 2. The findings revealed that 66% of the farmers harvested only 1-20 bags of rice per cropping, while 25% harvested 21-40 bags per cropping, 7% of the farmers gathered around 41-60 bags, and only 2% of the farmers achieved a harvest of 81-100 bags. It is shown that most of the farmers' respondents are low-yielding or low-production, which will be converted into cash. It shows that farmers in barangay Tubog will earn a low income because of their low production. The table below indicates farmers received P10,500 for every 1-20 bags harvested, P30,500 for every 21-40 bags harvested, P50,000 for every 41-60 bags harvested, P70,500 for every 61-80 bags harvested, and P90,500 for every 81-100 bags produced. These results demonstrated that the amount of yield harvested directly impacted the income received by the farmers since the higher the yield, the higher the revenue [19].

Furthermore, the table provided information on farmers' annual incomes. It revealed that most (100%) farmers generated their income from farming. Notably, 27% of the farmers had an income of P20,000 and above, equivalent to a monthly income of P1,666.67. On the other hand, 23% earned P5,001 to P8,000 and P17,000 to P20,000. Additionally, two or 5% of the farmers earned P8,001 to P11,000, and two earned P14,001 to P17,000. Based on the study by Reyes [20], farmers in the research location were considered poor for having an income of less than P10,957.

Based on these results, it was evident that the farmers in barangay Tubog belonged to 31.6% of farmers experiencing poverty, as per the data from the PSA in 2018 [7]. Furthermore, the income derived from rice harvests in barangay Tubog, Cawayan, Masbate fell significantly below the average base salary of farmers in the Philippines, which averaged to P9,833 monthly [21].

Table 2. Economic analysis of harvested produce of farmers in barangay Tubog

Variables	Income	Frequency (44)	Percentage (%)
<i>Estimated yield per cropping</i>			
1-20 bags	10,500	29	66
21-40 bags	30,500	11	25
41-60 bags	50,500	3	7
61-80 bags	70,500	0	0
81-100 bags	90,500	1	2
<i>Annual Income</i>			
5,000 and below		8	18
5,001-8,000		10	23
8,001-11,000		2	5
11,001-14,000		0	0
14,001-17,000		2	5
17,001-20,000		10	23
Above 20,001		12	27

3.3. Estimated pre-planting and planting expenses

The results of the study on pre-planting and planting expenses of rice farmers are presented in Table 3. Based on the farmers' estimates, the cost of land preparation varied among respondents. Most farmers (61%) reported an estimated cost of land preparation ranging from 501 to 2,500. A smaller percentage of respondents

(14%) indicated a higher estimated cost of land preparation, falling within the range of 4,501 to 6,500. Another 11% of farmers reported their land preparation cost around 2,501 to 4,500, while 7% stated a cost of 8,501 to 10,500. Only 2% of farmers mentioned a land preparation cost of 500 and below. Therefore, the Philippine government implemented the Rice Competitiveness Enhancement Program to compete with neighboring countries regarding rice production. The cost of production for their rice is relatively low compared to the cost of rice in the country.

Table 3. Pre-planting and Planting Expenses of rice farmers

Variables	Frequency	Percentage (%)
<i>Estimated cost for land preparation</i>		
500 and below	1	2
501-2,500	27	61
2,501-4,500	5	11
4,501-6,500	6	14
6,501-8,500	2	5
8,501-10,500	3	7
<i>Estimated labor cost/cropping</i>		
5,000 and below	39	89
5,001-8,000	0	0
8,001-11,000	3	7
11,001-14,000	0	0
14,001-17,000	1	2
17,001-20,000	0	0
Above 20,000	1	2
<i>Estimated total cost of fertilizer</i>		
5,000 and below	28	64
5,001-8,000	7	16
8,001-11,000	4	9
11,001-14,000	0	0
14,001-17,000	4	9
17,001-20,000	0	0
Above 20,000	1	2
<i>Estimated total cost of pesticides</i>		
Not practicing	6	14
500 and below	11	25
501-1,000	15	34
1,001-1,500	2	5
1,501-2,000	1	2
2,001-2,500	0	0
2,501-3,000	6	14
3,001-3,500	2	4
3,501-4,000	0	0
4,001-4,500	0	0
4,501 and above	1	2

Regarding labor costs, 89% of the farmers reported a cost of 5,000 and below. The frequency distribution in Table 3 shows that most respondents (39%) had an estimated labor cost below or equal to 5,000.

A small percentage of farmers (7%) reported a labor cost ranging from 5,001 to 8,000. No respondents reported labor costs falling within 8,001 to 11,000, 11,001 to 14,000, 14,001 to 17,000, 17,001 to 20,000, or above 20,000. Labor cost is the cost in rice production that most farmers responded to with high cost, similar to the study of Bordey [19]. Regarding fertilizer expenses, the study found that most farmers used synthetic fertilizers, particularly Complete fertilizer, Urea, and Ammonium phosphate. Despite the increasing price of Urea, it remained the most commonly used fertilizer among farmers. More than half (64%) of the farmers reported a fertilizer cost of 5,000 and below. The estimated total cost of fertilizer varied among respondents, with 16% stating a cost range of 5,001 to 8,000, 8,001 to 11,000, and 14,001 to 17,000, the same percentage (9%), while 2% of farmers reported a cost above 20,000. On average, the estimated cost of fertilizer was approximately 5,812.42 pesos. Regarding pesticide costs, the study found that 14% of farmers did not practice the application of pesticides on their farms. Among those who used pesticides, the cost varied. The majority (34%) reported a cost range of 501 to 1,000, followed by 25% who said a cost of 500 and below. The same percentage (14%) of farmers had a cost range of 2,501 to 3,000. A smaller percentage (5%) reported a cost of 1,001 to 1,500, while 4% stated a cost range of 3,000 to 3,500. Additionally, 2% of farmers reported costs of 4,001 to 4,500 and 4,501 and above for purchasing pesticides. The study's findings highlight that fertilizer expenses constitute the highest costs for farmers. This aligns with the results of a previous study by Turlley [6] and corroborates the data from the PSA in 2021, which indicated that farmers spent more on labor followed by fertilizer [22]

3.4 Estimated post-harvest expenses

In the study, the post-harvest expenses of rice farmers were examined (Table 4). The table presented the variable frequencies and percentages of estimated transport, milling, and drying costs per cropping. Regarding estimated transport costs per cropping, most farmers (84%) reported expenses of 500 and below. A smaller portion (14%) spent between 501 and 4,500, while only 2% of farmers had expenses of 4,501 and above. This result is opposite to the situation published by DA, in which the cost of transportation is high. Concerning estimated milling and drying costs per cropping, a mere 9% of farmers incurred expenses of 500 and below. The majority (89%) paid between 501 and 5,001, while there were no reported costs for the ranges of 5,001-10,000 and 10,001-15,000. However, 2% of farmers had high expenses of 15,001 and above. It is worth noting that the milling cost was estimated to be P2.50 per kilogram. The findings indicate that the majority of farmers (89%) paid within the range of 501-5,001 for milling. Meanwhile, a smaller proportion (9%) had lower costs of 500 and below, and a mere 2% faced higher charges of 15,001 and above in Tubog. These results suggest that rice farmers still allocate significant money for transportation and milling costs, which can impact their overall income. This is consistent with Bordey's study, which found that milling costs significantly affect rice production expenditures [19].

Table 4. Post-harvest Expenses of the farmers

Variables	Frequency	Percentage (%)
<i>Estimated transport cost/cropping</i>		
500 and below	37	84
501-4,500	6	14
4,501 and above	1	2
<i>Estimated milling and drying cost/cropping</i>		
500 and below	4	9
501-5,000	39	89
5,001-10,000	0	0
10,001-15,000	0	0
15,001 and above	1	2

3.5 Farmers household expenditures

A study showed that most farmers' household expenses were allocated to various categories, including food, electric bills, water, education, health, vices, clothes, and other miscellaneous items. However, the largest household expenses were spent on production costs and food. Table 5 summarizes the average monthly expenses for each expenditure category. Food accounted for an average expenditure of P2,122.73,

representing 17% of the total household expenses. The electric bill amounted to an average of P817.41, accounting for 6% of the expenses. Water expenses were relatively lower, with an average of P313.33, representing 3% of the total. Education expenses constituted the highest percentage, with an average of P4,225.00, accounting for 33% of the expenses. Health expenses averaged P607.04, representing 5% of the total. Vices, including alcohol and cigarettes, accounted for an average of P502.08, comprising 4% of the expenses. Clothes expenses totaled P788.88, also representing 6% of the total. Lastly, other expenses, including feed for farm animals and other miscellaneous items, averaged P3,250.00, accounting for 26% of the total [23].

Farmers had to divide their income to cover these household expenses. Education became the highest routine expenditure, constituting 33% of their income. Additionally, farmers allocated P3,250.00 per month, or 26% of their income, for other expenses such as farm animal feed and miscellaneous items. Farmers also utilized their income to supplement their food supply to purchase goods not produced on their farms. On average, they spent around P2,122.73 on food, representing 17% of their income. In addition to food, farmers allocated a portion of their income towards paying the monthly electric bill, averaging P817.41 or 6% of their income. The same proportion (6%) was dedicated to purchasing clothes for their children and themselves. Due to limited income, farmers could only allocate an average of P607.00 per month or 5% of their income for health expenses. Furthermore, farmers used a portion of their income, approximately P502.00 per month or 4%, to cover their vices, which included alcohol and cigarettes. Based on farmers' expenditures, the income from rice alone is not enough to cover their family's monthly expenses, making them sort from other sources of income and mostly leave rice farming to focus on other sources of income.

Table 5. Farmers household expenditure

Expenditure Category	Average Household Monthly Expenses	Percentage (%)
Food	2,122.73	17
Electric bill	817.41	6
Water	313.33	3
Education	4,225.00	33
Health	607.04	5
Vices	502.08	4
Clothes	788.88	6
Other	3,250.00	26
TOTAL	12,626.47	

The table below (Table 6) provides insights into the profitability of farms. The average annual income of farmers was reported to be P11,571.43. However, this income fell short of meeting household expenses, which averaged P12,626.47, and agricultural expenses, which averaged P15,681.82. These findings indicate that farming alone cannot satisfy a family's basic needs. As a result, farmers must seek alternative livelihoods to ensure their survival [24]. The study demonstrates that farmers' household expenses primarily consist of production costs and food. Education became the most significant routine expenditure, followed by other miscellaneous expenses. The need for additional income sources beyond farming alone highlighted the fact that the average annual income of farmers was not enough to cover both household and agricultural expenses.

Table 6. Profitability of the farmers' farms

Income in Farming	Amount
Average Income	11, 571.43
Expenditures	
Household Expenses	12,626.47
Agricultural Expenses	15,681.82
Total Expenditures	28,308.29

4. Conclusions

Most farmers in barangay Tubog were male, married, and served as the head of the family. They had a relatively low level of education, with most having only completed elementary school. Farmers had large families, and the size of the family influenced their expenditures, as larger families required more financial resources. Farmers in barangay Tubog had significant farming experience, with most cultivating their land for 11-20 years. Most farmers had a farm size of 1-3 hectares, and their average rice harvest was significantly lower than the expected average yield per hectare. Small farmers constituted 16% of the respondents, while the rest were considered large farmers with land holdings of 4-10 hectares or more. Farmers primarily relied on borrowed capital, and a majority owned their land. However, significant percentages were tenants or rented land for agricultural activities. The yield of their rice harvest directly influenced the income of farmers. The higher the yield, the higher the income. The annual income of farmers in barangay Tubog fell significantly below the average base salary of farmers in the Philippines, indicating that a substantial portion of farmers were experiencing poverty. The cost of land preparation varied among respondents, with the majority reporting an estimated cost ranging from 501 to 2,500 pesos. Labor costs were relatively low, with most farmers reporting 5,000 pesos and below. Fertilizer expenses constituted the highest costs for farmers, followed by labor costs. Synthetic fertilizers, particularly Urea, were commonly used by farmers. Pesticide costs varied among farmers, with a significant portion not practicing the application of pesticides. Among those who used pesticides, most reported costs ranging from 501 to 1,000 pesos.

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