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Research Article

Baseline Assessment of Rice Production Practices in Selected Barangays of Cawayan, Masbate, Philippines

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ABSTRACT

This descriptive study was conducted to obtain baseline data on the rice production practices in the identified barangays of Cawayan, Masbate for the government to offer real-time intervention. A structured survey questionnaire was used to gather information on the socio-demographic characteristics and rice production practices of the farmers. Aging farmers in the three barangays of Cawayan were observed with an age ranging from 50–60 years old. About 61% of them are classified as small-scale farmers and been tilling the land for more than 31 years. Despite the years they have been in farming, they still belong to the poorest sector with a monthly family income of PHP 800.00. About 96% of the farms in the identified barangays are rain-dependent. Majority of the farmers find difficulty in identifying the variety they are using, and 73% of them used seeds from their previous harvest as planting materials. Land preparation is done through the use of animal-drawn plows and employs direct seeding to minimize expenses. The manual method of controlling weeds, insect pests, and harvesting was practiced by the farmers. The application of fertilizer employed by the farmers is not based on the recommended rate. In totality, farmers obtained breakeven or negative income from their production. The gaps in the farming practices of the farmers can be filled through a holistic and sustainable extension program like Mag-Uma Kaupod ang Pamilya (Farming Together with the Family) in which family members are involved in agricultural production to achieve sufficient and sustainable food for all.

Keywords*: Mag-uma Kaupod ang Pamilya, Production Practices, Socio-demographic Characteristics*

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Introduction

Agriculture is the reservoir of all resources needed by all living organisms. It is considered as the backbone of the economy that makes the nation progressive if managed properly. Philippines is an agricultural country with a land area of 30 million hectares in which the majority of the Filipinos reside in rural areas and support themselves through various agricultural activities. As of 2020, there is a decline in land area devoted to farming, from 13.48 Mha in 2018 to 13.32 Mha (PSA, 2021). Despite this contraction, the agriculture sector remains the main driver of the Philippine economy, generating about 1.78 trillion pesos of gross value added that constitutes a 10.2% share of the country's GDP (Statista Research Department, 2021). The agriculture sector also occupied a large portion of employment among all sectors. However, it's a contribution to the country's total employment decreasing to 22.9% as of 2019 (PSA, 2020). Despite being an agricultural country, Philippines continues to import basic commodities like rice from the neighboring ASEAN nations like Indonesia, Vietnam, and Thailand.

Agriculture plays a significant role in providing food for the table. Farmers are considered unsung heroes in that their efforts are not recognized, but they continue to provide and produce food just to feed the whole world. The COVID-19 pandemic brought difficult challenges to all sectors, specifically in agriculture. Due to the limited movement of farm inputs and farm products, farmers were forced to stop farming and sell their products at the lowest price possible in order to recoup their investment. One good effect of a pandemic is that the government's attention is now focused on capacitating the farmers with the latest technologies and practices in producing sustainable agricultural commodities to minimize importations. The reasons for the importation are that the country won't be able to produce the large volume of agricultural products demanded by its population due to aging farmers; obsolete production practices employed by the farmers, anchored on traditional beliefs and principles in producing crops, and low technology adoption due to poor educational background. Proper and good agricultural practices are the

In the Bicol region, Masbate ranks 2nd in terms of farm area, measuring 207.5 thousand hectares with an average farm size of 3.5 hectares (PSA, 2004). The municipality of Cawayan has a total land area of 32,000 ha, of which 61.5%, or 19,667 ha, is identified as agricultural land. The majority of the people of Cawayan are leaving in rural areas, and farming is their primary source of income. Food sufficiency in the municipality is not impossible to achieve considering that more than half of its land area is allotted to agriculture. The adoption of new practices and technologies is one of the steps towards progressive agriculture in the municipality and nation as a whole.

DEBESMSCAT as an agricultural school, has a huge responsibility in fulfilling its mandate to improve the lives of the clientele, specifically the farmers. This paper aims to: (1) determine the socio-demographic profile of the farmers in the three barangays of Cawayan; (2) identify the rice production practices of the farmers; and (3) assess the production performance of the farm; and (4) craft long-term and doable extension programs relative to rice production practices.

Methods

Setting

The study was conducted in the three barangays of Cawayan, Masbate. The municipality of Cawayan is composed of 37 barangays and it is distributed into eight (8) districts with distinct livelihood activities. Barangay Maihao of district 2 and Barangays Itombato and Pin-as of district III were the sites of the study because there were active farming activities.

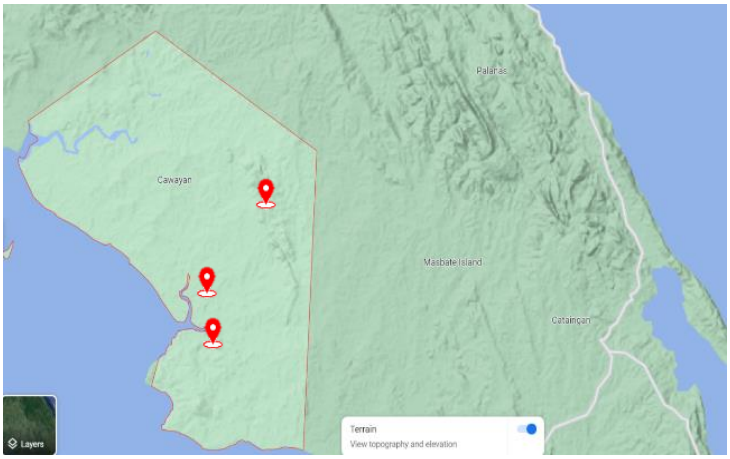

Fig. 1. Map of Cawayan Showing the Location of the Study

Sampling, Data Collection and Analysis

The study employed convenience sampling, in which researchers asked questions of the available farmers at the study site. A total of 60 farmers were interviewed, with 20 representatives per barangay. This study collected primary data through a structured survey questionnaire, informal interviews, and observations. Gathered data will be analyzed to get the mean and percentage of the observations. The data collected included the farmers' socio-demographic profile, farming background, site characteristics, planting material characteristics, pre-planting practices, nutrient management, weed management, insect-pest management, disease management, and income. The data collected was analyzed using descriptive and inferential statistics. The study employed frequency distribution and percentages to determine the production practices of the farmers in the identified barangays.

Results and Discussion

Socio-demographic profile of farmers

Farmers in the three barangays have different characteristics as shown in table 1. The identified characteristics were; age, gender, marital status, educational attainment, occupation and annual income.

Table 1. Socio-demographic profile of farmers with active farming activities in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-As (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Age								
Young (up to 34 years old)	1	5	3	15	2	11	6	10
Middle (35 to 50 years old)	8	40	8	40	9	47	25	42
Old (above 50 years old)	11	55	9	45	8	42	28	48
Gender								
Female	7	35	9	45	1	5	17	29
Male	13	65	11	55	18	95	42	71
Marital Status								
Married	19	95	19	95	15	79	53	90
Widow/er	1	5	0	0	2	11	3	5
Separated	0	0	0	0	2	11	2	3
Single	0	0	1	5	0	0	1	2

Variable	Itombato (n=20)		Maihao (n=20)		Pin-As (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Educational Attainment								
Elementary Graduate	6	30	2	10	0	0	14	14
Elementary Level	6	30	12	60	16	84	58	58
High School Graduate	5	25	0	0	0	0	9	9
High School Level	1	5	4	20	2	11	12	12
College Graduate	1	5	0	0	0	0	2	2
College Level	1	5	2	10	1	5	7	7
Occupation								
Farming	20	100	20	100	19	100	59	100
Annual Income								
10,000 and above	8	40	15	75	13	68	36	61
6,000-9,000	1	5	1	5	4	21	6	10
4,000-5,000	8	40	3	15	1	5	12	20
1,000-3,000	1	5	1	5	1	5	3	5
below 1,000	2	10	0	0	0	0	2	4

About 48% of the farmers in the three barangays are considered old, ranging from 50–60 years old, followed by middle-aged farmers (42%) and young farmers (10%). Among the three barangays, Itombato had the highest (55%) number of old farmers compared to Maihao (45%) and Pin-as (42%). A similar age finding was recorded as reported by Sarkar, M.D. (2014). Ageing farmers of the identified barangays is a result of the continuous migration and settlement of farmers' children into other parts of the country in search of better jobs and life. Farming activities in the three barangays were dominated by males (71%). The dominance of men in farming activities is attributed to the traditional view that men are superior to women. The female is in charge of pulling seedlings, seeding, harvesting and marketing the harvested produce. However, there was evidence that women's participation in agricultural activities in Maihao is high (45%) compared to other barangays. The majority (90%) of the farmers in the three barangays are married, followed by widows (5%), separated (3%), and single (2%) farmers, respectively. Most (58%) of the farmers obtained only elementary grades, and farming is their primary source of income. About 61% of the farmers had an estimated income of more than PHP 800.00 a month, which is below the national average monthly income of PHP 10, 727 per family per month (PSA, 2018). Among the three barangays, farmers in Itombato have the lowest average income, amounting to PHP 750.00 per month.

Considering the age and level of education of the farmers in the identified barangays, technology adoption offered by private and government agencies is merely impossible. Therefore, the goal to increase agricultural production and self-sufficient country is at stake.

Farming Background of the Farmers

Years in farming, farm size, capital, and system of land ownership were the factors in determining the farming background of the farmers. These factors were presented in table 2.

Table 2. Farming background of farmers with active farming activities in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Year in farming								
0-5 years	0	0	0	0	3	16	3	5
6-10 years	2	10	4	20	2	11	8	14
11-15 years	2	10	1	5	1	5	4	7
16-20 years	6	30	1	5	5	26	12	20
21-25 years	1	5	2	10	2	11	5	8
26-30 years	2	10	2	10	2	11	6	10
31 years and above	7	35	5	25	4	21	16	27
Farm size								
Marginal (below 1 ha)	6	30	3	15	5	26	24	24
Small (1 ha - 3 ha)	12	60	13	65	11	58	61	61
Medium (4 ha - 10 ha)	2	10	3	15	3	16	13	13
Large (10 ha above)	0	0	1	5	0	0	2	2
Sources of capital for farming								
Borrowed	3	15	4	20	4	21	19	19
Owned	17	85	16	80	15	79	81	81
System of Land Ownership								
Owned	15	75	8	40	6	32	49	49
Tenant	5	25	11	55	12	63	48	48
Rented	0	0	1	5	1	5	3	3

Farming is the dominant source of living in the three barangays of Cawayan and it was shown during the actual interview and farm visit. The majority (27%) of the farmers cultivated their land for 31 years or more. About 20% of the farmers ventured into farming for 16–20 years, and some (14%) of them went into farming for almost 6–10 years. It was noticed that there were new players (5%) in agriculture having a farm experience of months to 5 years. As observed, all farmers in identified barangays have been engaged in farming for several years. However, their life status has not changed. Still, they were at the bottom among identified basic sectors (PSA, 2020). One of the reasons for this scenario is the mindset of the farmers living in those barangays because they keep on waiting for the government assistance and when the assistance arrives, they do not head out and practice the recommendations of the government extensionists. They go back to their traditional practice of farming and the cycle continues. In totality, 61% of the farmers in the selected barangays are categorized as small farmers, with a total cultivated land area ranging from one to three hectares. Less than 25% of the farmers are considered marginal farmers, with less than one hectare of land devoted to farming. 2% of its farmers fall into the large category of farmers with a land area of more than 10 hectares. The majority (81%) of the farmers in the three barangays used their own money in financing their agricultural production activities and about 19% borrowed money from the available lending institutions in their area. According to the farmers, the money they invested in agricultural production did not give them an ample return and most of the time they had a breakeven result or sometimes a negative income due to the high cost of production and low price of their harvested produce. In terms of ownership, 49% of the farmers in the identified barangays have

positions on their cultivated land and 48% of them rent the land for them to engage in farming. Among the three barangays, Pin-as (63%) and Maihao (55%) have the highest percentage of farmers who rented the land. As observed, farmers who rent the land are more likely to succeed and have higher farm productivity (Qiu, et al., 2020).

other parts of the country in search of better jobs and a better life. Farming activities in the three barangays were dominated by males (71%). The dominance of men in farming activities is attributed to the traditional view that men are superior to women. The female is in charge of pulling seedlings, seeding, harvesting, and marketing the harvested produce. However, there was evidence that women's participation in agricultural activities in Maihao is high (45%) compared to other barangays. The majority (90%) of the farmers in the three barangays are married, followed by widows (5%), separated (3%), and single (2%) farmers, respectively. Most (58%) of the farmers obtained only elementary grades, and farming is their primary source of income. About 61% of the farmers had an estimated income of more than PHP 800.00 a month, which is below the national average monthly income of PHP 10, 727 per family per month (PSA, 2018). Among the three barangays, farmers in Itombato have the lowest average income, amounting to PHP 750.00 per month. They only have a primary school education, and farming is their primary source of income. About 61% of the farmers had an estimated income of more than PHP 800.00 a month, which is below the national average monthly income of PHP 10, 727 per family per month (PSA, 2018). Among the three barangays, farmers in Itombato have the lowest average income, amounting to PHP 750.00 per month.

Characteristics of the Farmers Land

In farming, it is ideal to have a suitable land area where its location conforms to the suggested parameters set by the agriculture technician. Some of the parameters in selecting site for planting are presented in table 3.

Table 3. Site characteristics cultivated by farmers of the three barangays in Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Type o soil								
Clay soil	16	80	15	75	10	53	41	70
Sandy Soil	2	10	4	20	9	47	15	25
Do not know	2	10	1	5	0	0	3	5
Soil color								
Black	13	65	9	45	9	47	31	53
Brown	7	35	9	45	10	53	26	44
Gray	0	0	2	10	0	0	2	3
Sources of water supply								
Impounded water	1	5	0	0	0	0	1	2
Irrigation	1	5	0	0	0	0	1	2
Rainfall	18	90	20	100	19	100	57	96

Soil type is the number one component for successful farming. If a planted crop does not conform to the type of soil available in the area, its growth and development are significantly affected. The study revealed that 70% of the farmer's land in identified barangays was considered clay soil, 24% sandy soil (25%), and 5% of the farmers didn't know the type of their soil. Among those barangays, Itombato had the highest (80%) number of farmlands that fall

under the clay type of soil. Clay-type soil is more productive than sandy soil in terms of yield and panicle number (Dou, 2016). Soil color is the determinant of fertility for the farmers, and the study revealed that more than half (53%) of the land of the farmers is black, 44% brown, and 3% gray in color, respectively. As we venture into farming, another vital resource is water. Agricultural water is used for irrigation, pesticide and fertilizer applications, crop cooling (for example, light irrigation), and frost control. The absence of water generally affects agricultural production. In order to succeed in farming endeavors, farmers must know the source of water that will be used in their production. About 96% of the farmlands in Cawayan are rain-dependent. Noting this scenario in the farmlands of Cawayan farmers, the sustainability of production for various agricultural commodities like rice and the like is impossible to achieve. Government intervention when it comes to managing water or methods of water harvesting should be extended to these barangays to help them in their production.

Characteristics of Seeds Used by the Farmers

One of the indicators of successful production, particularly in agriculture, is the selection of planting materials of excellent quality. Before establishing a farm, farmers should consider the following: the variety of seeds to be used; average and maximum yield; classification; and sources of seeds. The characteristics of seeds used by the farmers in the identified barangays of Cawayan are presented in table 4.

The majority (42%) of the farmers of three barangays were not able to recognize the seed variety they were using. About 31% of the farmers used hybrid seeds and 27% used local seeds. Farmers in Pinas (65%) have the least knowledge and skill in identifying seed varieties of the three barangays. Knowing the seed variety is very important for farmers to prepare the necessary materials and apply the appropriate measures to have an abundant harvest. On the yield aspect, still, a majority (73%) of the farmers don't have knowledge of the expected yield of the seed varieties they are using on a hectare basis.

Table 4. Characteristics of seeds used by the farmers in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Variety used								
Don't Know	6	30	7	35	12	63	25	42
Hybrid	8	40	6	30	4	21	18	31
Local	6	30	7	35	3	16	16	27
Yield quality of variety used								
Low yielding	1	5	1	5	1	5	3	5
Not sure	11	55	18	90	14	74	43	73
High yielding	8	40	1	5	4	21	13	22
Classification of variety used								
Certified Seed	8	40	7	35	5	26	20	34
Good Seed	12	60	9	45	8	42	29	49
Don't Know	0	0	4	20	6	32	10	17
Source of seeds								
Bought	1	5	3	15	1	5	5	8
Given by DA	6	30	1	5	4	21	11	19
Own, from the previous Cropping	13	65	16	80	14	74	43	73

Less than half (49%) of the seeds used by the farmers are classified as good seeds. Others (34%) use certified seeds, and 17% of the farmers really don't know the seed classification. The majority (73%) of the seeds used by the farmers in the identified barangays came from their previous cropping and only 19% came from the Department of Agriculture. The lack of knowledge of the farmers in different aspects of farming activities can be attributed to their old beliefs in farming and their educational background because most of them are elementary graduates.

Farmers Pre-planting practices

Table 5 shows the practices of farmers before crop establishment. The overall basis for crop selection of farmers on their farms is climatic conditions, which accounts for 76% of responses. Barangay Maihao has a 100% response to climatic conditions. This result is congruent with the statement of Obcemea (1996) as cited by Espino and Atienza (n.d) that the cropping pattern is based on the constraints on water, land suitability, and climatic conditions. A number of crops per year were also part of the practices of farmers. It showed in the study that the majority of the farmers planted twice a year and once a year, with responses of 49% and 48%, respectively. Farmers in Itombato and Pin-as, on the other hand, can plant all year round because they can plant three times a year. This is the same practice at the national level where some farmers practice rice during the rainy season and then corn or mungbean after planting rice (Espino and Atienza, n.d). Even though the government is doing its best to mechanize crop production, almost all (93%) of the farmers prepare their soil using carabao-drawn implements, which is a more laborious and expensive method of preparing the soil compared to farm machinery (IRRI, n.d).

Table 5. Pre-planting practices of farmers in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Basis for crop selection								
Climatic condition	11	55	20	100	14	74	45	76
Existing traditional practices	1	5	0	0	1	5	2	3
Household needs	1	5	0	0	0	0	1	2
Market demand	2	10	0	0	2	11	4	7
Recommendation from other farmers	2	10	0	0	0	0	2	3
Seeds availability	3	15	0	0	2	11	5	8
Cropping per year								
Thrice	1	5	0	0	1	5	2	4
Twice	10	50	9	45	10	53	29	49
Once	9	45	11	55	8	42	28	47
Used in land preparation								
Carabao drawn implements	19	95	19	95	17	89	55	93
Hand Tractor	1	5	1	5	2	11	4	7
Duration of land preparation								
1 week	7	35	10	50	11	58	28	48
2 weeks	4	20	7	35	5	26	16	27
3 weeks	9	45	3	15	3	16	15	25
Method of plant establishment								
Both	7	35	2	10	3	16	12	20
Direct Seeding	13	65	15	75	1	5	29	49
Transplanted	0	0	3	15	15	79	18	31

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Do you practice pre-germination process?								
No	5	25	12	60	0	0	17	29
Yes	15	75	8	40	19	100	42	71
Do you synchronize your planting with other farmers?								
No	1	5	1	5	3	16	5	8
Yes	19	95	19	95	16	84	54	92

For better plant growth and development, the duration of land preparation plays a good part. As standard practice, three (3) to four (4) weeks are the recommended days for land preparation (IRRI, n.d). The study reveals that there are more farmers (48%) who prepare their land only 1 week before planting. The reason behind this is that farmers in these barangays are irrigated. Nevertheless, there are some farmers who prepare their soil for 3 weeks before planting. On the method of crop or plant establishment, almost half (49%) of the farmers practiced direct seeding for their crop production practice. There were also 31% who transplanted (in upland beds) and 20% who practiced both transplanting and direct depending on the weather conditions. Both methods of crop establishment have advantages and disadvantages, but higher yield and profit always favor transplanted crops (IRRI, n.d). There is what we call the pre-germination process in the practices before sowing seeds for direct planting, and the data shows that there are more (than 71) farmers who pre-germinate their seeds first before planting them on a seedbed or main fields. In addition, an overwhelming response from barangay Pin-as that all of the respondents were practicing the pre-germination process, which is the most recommended practice for rice production to save farm seeds and pests such as birds. With the practice of synchronous planting, 92% of the farmers are planting together with their neighboring farms.

Farmers Crop Nutrient Management

The study reveals that not all, or 5%, of the farmers in the two barangays do not apply fertilizer on their farms for their crops. Fertilizer is a substance added to the soil to increase soil fertility for crop nutrition, which is very essential for good or high production (Lantican, 2001). However, it is not just in Cawayan that farmers don't apply fertilizer since, according to the study by Quddus and Kropp (2020), about 16% of the farmers do not apply fertilizer on their farms. For those who apply fertilizer, 75% responded that they apply synthetic fertilizer only, 17% apply organic only and 8% apply both synthetic and organic fertilizers.

Table 6. Crop nutrient management of farmers in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Did you apply fertilizers on your crops?								
Yes	20	100	18	90	18	95	56	95
No	0	0	2	10	1	5	3	5
Type of fertilizers applied								
Both	4	20	1	5	0	0	5	8
Inorganic/Synthetic	12	60	17	85	15	79	44	75
Organic	4	20	2	10	4	21	10	17
Number of bags of organic fertilizer applied								
1-3 bags/ha.	3	15	2	10	3	16	8	14
4-6 bags/ha.	1	5	0	0	1	5	2	3

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Type of synthetic fertilizer used								
Ammonium Phosphate (16-20-0)	1	5	3	15	2	11	6	10
Complete (14-14-14)	10	50	10	50	2	11	22	37
Urea (46-0-0)	1	5	4	20	11	58	16	27
Number of bags of synthetic fertilizer applied								
1-3 bags	10	50	13	65	15	79	38	64
4-6 bags	2	10	3	15	0	0	5	8
7-9 bags	0	0	1	5	0	0	1	2

In applying fertilizers, the amount of application also affects crop performance. In the study of Azarpour et al. (2014), the growth and the grain yield of rice are significantly related to the increase in fertilizer application, particularly nitrogen fertilizer. In the case of Cawayan, Masbate, it shows that out of the 10 farmers who apply organic fertilizer, only three of them apply 4-6 bags per hectare. In terms of synthetic fertilizer, there are more farmers (64%) who apply one-to-three bags compared to higher fertilizer applications. Furthermore, the most common fertilizers used in Cawayan were complete fertilizer (T14) and urea, accounting for 37% and 27%, respectively, resulting in low productivity.

Farmers Crop Protection Problems and its Management

Pests and diseases are one of the limiting factors in crop production (Oerke, E.C. 2006). Data were collected and analyzed in terms of percentage and frequency in order to understand the practices and scenarios in selected barangays of Cawayan in terms of pests and diseases. Based on the data gathered, the majority of the farmers (86%) declared that they have problems with weeds in their farmland; this is true for the three barangays under survey; this is true for all other parts of the crop production area (Oerke, E.C. 2006). In addition, almost all (97%) of the farmers practice traditional yet environmentally friendly weed management methods, such as manual weeding, which is a laborious and expensive method of weed management.

Table 7. Weeds, insect pests, and diseases management of farmers in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Are weeds a major problem in your field?								
No	1	5	1	5	0	0	2	3
Sometimes	2	10	3	15	1	5	6	10
Yes	17	85	16	80	18	95	51	86
Methods of controlling weeds								
Applied herbicide	1	5	0	0	1	5	2	3
Manual weeding	19	95	20	100	18	95	57	97
Is insect-pest a major problem in your field?								
Sometimes	4	20	5	25	4	21	13	22
Yes	16	80	14	70	15	79	45	76
No	0	0	1	5	0	0	1	2
Can you identify insect-pest?								
No	4	20	3	15	1	5	8	14
Yes, all	3	15	0	0	0	0	3	5

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Yes, some	13	65	16	80	17	89	46	78
Not sure	0	0	1	5	1	5	2	3
Methods of controlling insect-pests								
Applied pesticides	11	55	5	25	4	21	20	34
Biological control	1	5	0	0	0	0	1	2
Crop Rotation	1	5	0	0	0	0	1	2
Hand picking	5	25	10	50	12	63	27	46
Synchronous planting	2	10	5	25	3	16	10	17
Type of insecticides used								
Cymbush	7	35	3	60	3	16	13	22
Karate	3	15	1	20	1	5	5	8
Lannate	1	5	0	0	0	0	1	2
Bushwak	0	0	1	20	0	0	1	2
Frequency of pesticide application								
Once	7	35	1	20	3	16	11	19
Twice	4	20	3	60	1	5	8	14
Thrice	0	0	1	20	0	0	1	2
Are kuhols a major problem in your area?								
No	3	15	3	15	0	0	6	10
Sometimes	5	25	7	35	5	26	17	29
Yes	12	60	10	50	14	74	36	61
Methods of controlling kuhol								
Applied chemical	3	15	1	5	1	5	5	8
Picking	17	85	19	95	18	95	54	92
Are plant diseases a major problem in your area?								
No	2	10	2	10	2	11	6	10
Sometimes	9	45	8	40	11	58	28	47
Yes	9	45	10	50	6	32	25	42
Do you practice IPM (Integrated Pest Management)?								
No	7	35	2	10	6	32	15	25
Not Sure	5	25	15	75	11	58	31	53
Yes	8	40	3	15	2	11	13	22

According to Palis (1998), farmers believe that all insects are destructive to their crops, and chemically produced insecticides are very effective in controlling this pest, aside from being readily available on the market. In the municipality of Cawayan, 76%, or 45 farmers, stated that insects are always a major problem in their field. However, 22%, or 13 farmers, declared that insect pests are a problem sometimes. Further, there are only 5% or 3 farmers who said that they can identify all insect pests, which is a very small number of farmers who know their enemies in the field. With regards to the method of control, a higher percentage (46) of farmers stated that they handpick insect pests in order to control them, and a significant 34% applied insecticide as a mode of insect-pest management, and the most common insecticide they applied was the cymbush with active ingredients Cypermethrin, Aromatic Solvent oil, and emulsifier. In terms of the frequency of application, there are more farmers (19%) who apply once compared to twice and thrice, which are 14% and 2% respectively.

Golden apple snail (*Pomacea canaliculata*) which is known to be one of the destructive pests of rice also causes damage/problem in some of the community in the Municiaplity of Cawayan. 61% of the farmers stated that Golden apple snail is major pest in their field

while there are some stated that it just occurs sometimes (29%) and 10% stated that it is not a problem in their farms. To control this pest, 92% of the farmers practice the natural and laborious method of managing the Golden apple snail which is the hand picking, only 8% or 5 farmers practicing chemical control.

For crop diseases encountered by the farmers, 47% of the farmers stated that it occurs sometimes, 42% declared that it is a major problem in their field and only 10% stated that they do not have problem with crop diseases and it is almost equally experienced by the three barangays in Cawayan, Masbate. However, according to Mathulaprangsan (2020), rice diseases recognition is hard specially to the farmers.

Harvest and Post-Harvest Practices of the Farmers

One of the reasons for crop production losses is through harvesting and post-harvest handling of farmers. About 3.65% of crop losses is due to harvesting (Qu, 2021). Imagine if farmers expected to have 100 bags fresh grains harvest in a one (1) hectare of land, approximately the total yield lost due to harvesting is 200 kilos. Some harvest and post-harvest practices of farmers in the identified barangays were presented in table 8.

Table 8. Harvesting and post-harvest practices of farmers in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Methods of harvesting crops								
Manual Labor	17	85	20	100	13	68	50	85
Mechanical Harvester	3	15	0	0	6	32	9	15
Methods of threshing the harvested crops								
Foot tramping	2	10	2	10	1	5	5	8
Hand beating	2	10	2	10	0	0	4	7
Mechanical thresher	16	80	16	80	18	95	50	85
Handlings of harvested crops								
Home consumption	14	70	1	5	1	5	16	27
Put on storage for sometime	5	25	18	90	18	95	41	69
Sold to the consumers	1	5	1	5	0	0	2	3
Buyers of harvested produce								
Local Buyers	1	5	1	5	0	0	2	3
Private traders from nearby municipalities/city	0	0	0	0	0	0	0	0
Handlings of agronomic by products								
Burn	5	25	9	45	11	58	25	42
Turn to compost	13	65	10	50	8	42	31	53
Used as animal feed	1	5	0	0	0	0	1	2
Used as roofing material	1	5	1	5	0	0	2	3

Majority (85%) of the farmers in the three barangays performed manual harvesting and 15% of them used mechanical harvester in reaping rice from the field. During threshing of the reaped rice, 85% of the farmers used mechanical thresher, 8% performed foot tramping and 7% used hand beating in removing grains from the stalks. After threshing, about 69% of the farmers in the identified barangays put their harvested produce in the storage facility for future use (consumption and planting material). Some (27%) farmers produced rice intended purely for home consumption and few (3%) of the farmers sold their harvest produce to the local buyers. Among the three barangays, Itombato had the highest number of farmers who produced solely for consumption. In terms of managing the rice by-product specifically

rice straw, more than half (53%) of the farmers turned it into compost, some (42%) burned, others (3%) used as roofing material and 2% of them used as animal feed. If farmers had ample knowledge in managing the crop by-product, it could be a potential source of income for them to augment their family income like using the rice straw as media for mushroom production.

Economic Analysis of Farmers Harvest

Table 9 is the analysis of farmers experience in their crop production. Based on the gathered data, there are more farmers (63%) who harvest an average of 5-604 kilogram of rice, 20% harvested 603-1,203 kg, 8% harvested 1,204-1,802, while there are 7% who harvest 2,402-3,000 and only 2% harvested 1,803-2,401 kg. In terms of their assessment on the status of their harvest, 10% of the farmers does not know or they cannot estimate what was the status of their yield, 34% farmers answer low yield, while 36% says average and 46% declared they have good yield. For the assessment of their profitability, 10 farmers or 17% of the respondents incurred loss, 16 farmers just get break even, 11 farmers get profit from their harvest and a large 22 farmers does not even know how was their profit in crop production. This problem of the rice farmers in the Municipality of Cawayan is related to the problem of farmers in other part of the country that is why it's hard to compete with other Asian country for rice production Bordey et al (2015).

Table 9. Economic analysis of harvested produce of farmers in the three barangays of Cawayan

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Average yield per cropping (kg)								
5-604	11	55	12	60	14	74	37	63
603-1,203	4	20	5	25	3	16	12	20
1,204-1,802	3	15	1	5	1	5	5	8
1,803-2,401	0	0	1	5	0	0	1	2
2,402-3,000	2	10	1	5	1	5	4	7
Status of the harvest								
Average	6	30	5	25	10	53	21	36
Don't know	2	10	2	10	2	11	6	10
Good	7	35	13	65	7	37	27	46
Low	5	25	5	25	10	53	20	34
Profitability of production								
Breakeven	8	40	3	15	5	26	16	27
Don't know	1	5	11	55	10	53	22	37
Incurred loss	2	10	6	30	2	11	10	17
Profitable	9	45	0	0	2	11	11	19
Estimated labor cost for land preparation (Php)								
115-2,372	7	35	5	25	8	42	20	34
2,373-4,629	4	20	11	55	9	47	24	41
4,630-6,886	7	35	2	10	2	11	11	19
6,887-9,143	2	10	1	5	0	0	3	5
9,144-11,400	0	0	1	5	0	0	1	2
Estimated seed cost per cropping (Php)								
40-7,232	20	100	18	90	17	89	55	93
7,233-14,424	0	0	1	5	0	0	1	2
14,425-21,616	0	0	0	0	1	5	1	2
21,617-28,808	0	0	0	0	0	0	0	0
28,809-36,000	0	0	0	0	1	5	1	2

Variable	Itombato (n=20)		Maihao (n=20)		Pin-as (n=19)		Total (n=59)	
	F	%	F	%	F	%	F	%
Estimated labor cost per cropping (Php)								
400-5,395	20	100	11	55	13	68	44	75
5,396-10,390	0	0	4	20	6	32	10	17
10,391-15,385	0	0	2	10	0	0	2	3
15,386-20,380	0	0	2	10	0	0	2	3
20,381-25,375	0	0	1	5	0	0	1	2
Estimated cost of fertilizer per cropping (Php)								
0-3,640	18	90	15	75	18	95	51	86
3,641-7,280	2	10	3	15	0	0	5	8
7,282-10,920	0	0	1	5	1	5	2	3
10,921-14,560	0	0	0	0	0	0	0	0
14,561-18,200	0	0	1	5	0	0	1	2
Estimated cost of pesticide per cropping (Php)								
0-3,600	20	100	20	100	11	58	51	86
3,601-7,200	0	0	0	0	0	0	0	0
7,201-10,800	0	0	0	0	0	0	0	0
10,801-14,400	0	0	0	0	0	0	0	0
14,401-18,000	0	0	0	0	0	0	0	0
Estimated transportation cost per cropping (Php)								
10-408	4	20	14	70	10	53	28	47
409-806	4	20	4	20	5	26	13	22
807-1,204	5	25	2	10	3	16	10	17
1,205-1,602	2	10	0	0	1	5	3	5
1,603-2,000	5	25	0	0	0	0	5	8
Estimated cost of post-harvest practices per cropping (Php)								
10-2,008	16	80	20	100	19	100	55	93
2,009-4,006	2	10	0	0	0	0	2	3
4,007-6,004	1	5	0	0	0	0	1	2
6,005-8,002	0	0	0	0	0	0	0	0
8,003-10,000	1	5	0	0	0	0	1	2

Conclusion

Study concluded that farmers of the three identified barangays are considered old or ageing farmers with an age ranging from 50-60 years old. Farming activities was dominated males, however, there is an increasing trend of women participation in farming specifically in barangay Maihao. Both barangays recorded a very low family income amounting to Php 800.00 per month. Considering this income, farmers cannot finance all of their monthly expenses. Farmers of three barangays are considered small scale farmers and cultivated their land for more than 31 years. Study found out that there are new comers and players in agriculture in the identified barangays, however, these individuals ventured in farming because they stopped in schooling. Almost half of the farmers have possession on the land they are tilling and other half are tenants. As to finances, majority of the farmers used their own money in financing their production. It was also noted that all farmlands are rain dependent having clay type of soil with black and brown soil color. Majority of the farmers don't really know the varieties they are using either it is high yielding or not because most of their planting materials are coming from their previous harvest. In pre-planting activities, farmers did not conform to the recommended number of weeks of land preparation which is 3 to 4 weeks. Good to note that all farmers applied fertilizers, however, they don't have basis on how many kilos they need to apply. Weeds and insect-pests are

problems in the field and farmers employed manual methods controlling weeds and insect-pests to protect their crops for future damages. Harvesting and post-harvest handling are the crucial for the farmers because they still used manual method in reaping the rice crops. Majority of the farmers did not consider farming as a business because their harvested produce is for family consumption and stored for future usage. High cost of labor and other inputs are the factors of low income of production among farmers. In totality, farmers don't know about the status of their production whether it is gaining or losing due lack of records.

Recommendations

It is recommended that, educating and capacitating farmers with the latest farming knowledge and skills through the help of HEIs and LGUs are vital component in realizing food sufficient country. HEIs and LGUs should also capacitate its faculty extensionists and extension workers so that they can share timely and appropriate technologies relevant to agriculture. Government should have financial literary program to farmers with emphasis on record keeping as vital component in managing and sourcing out money to be used in the production. Government through DA should bring all agencies closer to the farmers particularly Philippine Crop Insurance, Landbank, Social Security System, and TESDA to avail the services intended for the farmers. Involve farmers in the research activities by making their field as experimental area for them to observe and experience how advantageous the technology being offered by the government like new rice varieties, use of digital agriculture tools (MOET and CRM applications) because technology adoption of the farmers is quite easy if they see and experience the effect of the technology in production. As a lone state college in the Province of Masbate, DEBESMSCAT should continue their *Mag-Uma Kaupod ang Pamilya* (Farming Together with the Family) extension program because it is a holistic and sustainable involving all family members in agricultural production to achieve sufficient and sustainable food for all.

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