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Cost and Return Analysis of Cassava and Sweet Potato Production in Selected Towns in Northern Samar, Philippines

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Abstract

The study sought to determine the socio demographic profile of the farmers, describe the production practices of cassava and sweet potato farmers, determine the cost and return of cassava and sweet potato from production to consumption, marketing strategy, and identify the problems encountered by the cassava and sweet potato farmers. The study was conducted in the selected barangays of San Roque Northern Samar from March to April 2020. it used the descriptive quantitative method of research using purposive sampling method where farmers who have production of cassava and sweet potato in the community were purposively chosen Eighty-five respondents were used in the study. The result shows that a majority of farmers engaged in the production of cassava and sweet potato were married, were elementary and high school graduates, monthly income ranged from 1,000-3,000, their source of income did not depend only on cassava and sweet potato production, they were also engaged in fishing, copra and others, majority lived in their houses with 1-9 members, or they belonged to the big family. A majority planted their cassava and sweet potato in the upland area, based on their observation that it is better to plant in the upland area, some of them were owner or tenant in 1 to 2 ha area, months of planting is from March to April and harvesting time August until September during summer season with an assurance that root crops grow in this kind of season. Majority of the farmers of cassava and sweet potato prepared planting material both cutting and shoot, and the variety came from co-farmers. Majority of the average weight produced per hectare was from 100-150 kgs sometimes less than or higher, the times to harvest per cropping is once or twice. The duration of planting up to harvest is good for six months. Post-harvest method mostly used were wrapping and drying. The starting capital is from 200-1,000 pesos, and the selling time per harvest is 5,000, annual net profit in every harvest is 10,000 above. The farmers spent on marketing their products

(transportation). The modes of selling were through common buyer middlemen, retailer and wholesaler, both per kilo and sack were used to sell and this is through cash-to-cash basis. The price per kilo worth is 40-60 pesos and per sack worth 500-1000 pesos. They gave a discount to the loyal customer from 10% to 25%. The buyers and customers were within the municipality. The supply of cassava and sweet potato was adequate, and this sustained the needs of the town folks. The major problems faced by the farmers were weather and financial concern.

Keywords: cost analysis, return analysis, cassava, sweet potato, agricultural production.

Introduction

Root crops in Philippine agriculture are among the important sources of food, feed and starch of the Filipinos. They contribute 4% to gross value added from agriculture, and about half million hectares of agricultural land are devoted to root crop production annually (*Philippine Statistics Authority*, 2017).

In the Eastern Visayas region, cassava and sweet potato are the most preferred root crops, with an average per capita consumption of 6.97 kilograms of cassava and 6.86 kilograms of sweet potato. Among the provinces, Eastern Samar demonstrated the highest consumption rates, with 7.50 kilograms of cassava and 11.79 kilograms of sweet potato per person annually (PSA, 2017).

Cassava (*Manihot esculenta*) holds significant agricultural prominence in the Philippines, both in terms of crop area and production value. The cultivation of cassava encompasses a range of traditional and improved varieties. Sweet potato (*Ipomoea batatas*), on the other hand, serves as a crucial staple and emergency food in numerous countries, particularly for impoverished communities such as resource farmers and urban dwellers.Over 80% of the world's root crop production is now in Asia. Farmers persist in cultivating sweet potato due to its versatile applications. Every part of the plant is utilized, including its roots, leaves, and vines, which find various uses in food, beverage, alcohol production, and animal feed. Sweet potato roots and leaves are commonly consumed as vegetables in households and restaurants. Additionally, they are processed into bakery products, candies, pastries, and animal feed chips. The vines are also utilized as silage for livestock (*Philippine Statistic Authority (PSA) 2017 Consumption of Selected Agricultural Commodities in the Philippines by classification of Barangays)*.

Cassava and sweet potato are the top producing and consuming crops in Northern Samar, specifically in San Roque. These root crops are significant in advancing the country's food security because of their wide

range adaptability of growing conditions and resilience to natural disasters such as typhoon, which frequently hit Northern Samar. Hence, these observations prompted the researcher to conduct this study that will help encourage farmers to plant these root crops for future purposes.

Roa et al. (2017) stated that numerous coastal communities, particularly in the Eastern Visayas (Region 8), continue to face poverty, food insecurity, and vulnerability. The slow economic growth, coupled with low productivity in the fisheries and agriculture sectors, along with natural disasters and other factors, perpetuates an ongoing cycle of poverty in these coastal towns. Both scientific research and anecdotal evidence highlight the potential of root and tuber crops in addressing food and nutrition security, enhancing resilience, and improving incomes in these coastal areas. Region 8 already relies on root and tuber crops as a source of sustenance during times of disasters.

Simeon (2017) stated that the Philippines experienced enhanced production of its primary vegetable and root crops during the second quarter. This growth can be attributed to expanded harvested areas resulting from favorable climatic conditions. Sweet potato and cassava stand out as prominent root crops within the country.

According to the Philippine Statistics Authority (PSA, 2017) their latest quarterly bulletin that cassava and sweet potato production witnessed a nearly two percent growth. This increase can be attributed to the development of larger tubers, facilitated by adequate rainfall and sufficient soil moisture. Among the regions, Eastern Visayas emerged as the top producer during the quarter, contributing to nearly 40 percent of the total output.

Akerele et al. (2018) stated that cassava holds a significant position in agriculture, standing out due to its distinctive characteristics that set it apart from other food crops. It exhibits a remarkable ability to thrive in poor soil conditions and can yield well even with limited rainfall. Furthermore, its perennial nature allows for flexible harvesting as needed. Cassava has economic importance because it serves as raw materials for some industries and has a rich and very important source of food item to millions of people. Additionally, cassava can produce the nationally required food security if further encouraged.

Preciados et al. (2018) stated that the supply of this crop in the Philippines is comparatively low and less competitive when compared to other ASEAN countries. There have been calls to investigate the factors influencing agricultural supply in the country to support policy initiatives. However, limited studies have been conducted specifically focusing on the cassava subsector.

Additionally, cassava plays a very important role in terms of additional source of income for small holder farmers.Nevertheless, the fluctuating

price of cassava raises significant concerns. Hence, it becomes crucial to assess and comprehend the costs and returns associated with cassava production. This analysis aims to identify and address the factors that contribute to low production, ultimately leading to increased income for smallholder farmers (Thav, 2017).

Prakash et al. (2018) cited that sweet potato holds a prominent position among the main crops, as many farmers rely on it as a significant source of food for human consumption. It plays a crucial role in ensuring food security and boosting farmers' income. However, certain farmers traditionally cultivate sweet potato solely for food purposes, resulting in minimal input requirements for production and comparatively high returns. This aspect makes sweet potato cultivation particularly attractive to farmers facing resource constraints.

Sugri et al. (2017) stated that sweet potato has gained significant recognition for its adaptability to various production environments and its ability to yield well with minimal external inputs. However, the sweet potato value chain (SPVC) remains underdeveloped in many countries where it is produced. Over the past two decades or more, sweet potato has gained prominence due to its short growth cycle and resilience in diverse agroecologies and water-stressed soils. These characteristics make sweet potato particularly valuable to resource-poor farmers, as it can yield 15 to 50 tons per hectare with minimal reliance on external inputs.

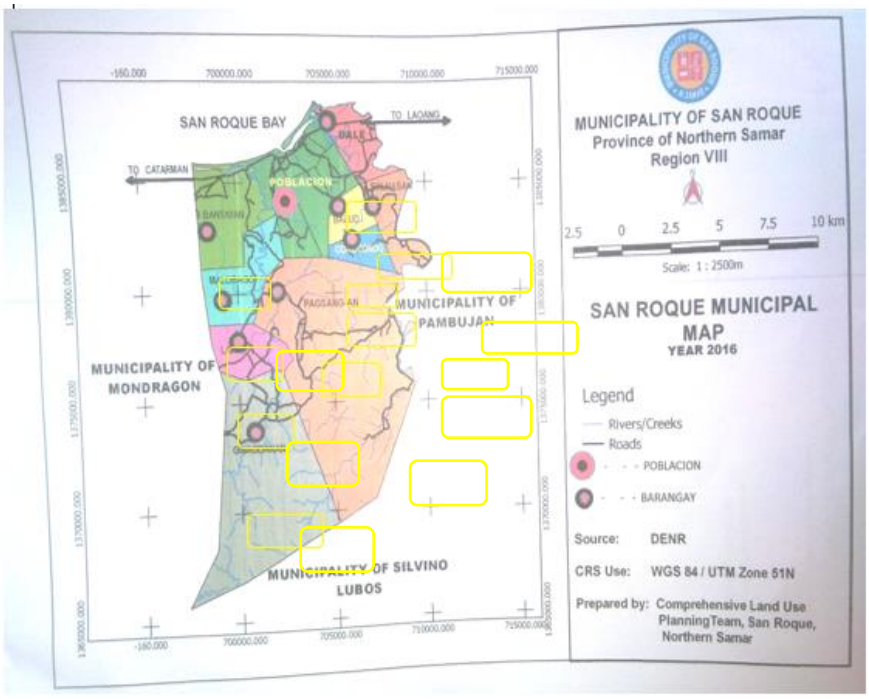
Many Filipino farmers who raise sweet potato are increasingly being supplied with high quality sweet potato varieties and slips for planting. Additionally, the potential and importance of the crops are being recognized by a cross section of agricultural policy makers in the country. New profitable varieties and sweet potato processing techniques are being rolled out in the Philippines that have increased the value-add and the profitability of the sweet potato crop (Importance of Sweet potato in the Philippines, 2017).

The objectives of this study are as follows: (1) to assess the socio-demographic characteristics of cassava and sweet potato farmers in the area; (2) to examine the farming profiles associated with cassava and sweet potato cultivation; (3) to analyze the cost and returns involved in the production and marketing of cassava and sweet potato; and (4) to identify the challenges encountered by farmers throughout the production and marketing processes of these crops.

Methodology

The research took place in San Roque, Northern Samar, specifically targeting nine (9) chosen barangays namely; Dale, Balud, Coroconog, Balnasan, Bantayan, Malobago, Pagsang-an, Ginagdanan, and Lawaan, shown in Figure 1. The criteria for selecting the barangays are; land area for planting and involvement in farming root crops.

Figure 1. Map of the Municipality of San Roque, Northern Samar



Legend:

The research method that was used in this study is descriptive survey method in order to determine the economic analysis of cassava and sweet potato production in San Roque Northern Samar. The respondents of the study were the cassava and sweet potato farmers/growers in the selected barangays of San Roque. A purposive sampling method was used. The researchers secured first the list of cassava and sweet potato farmers from the Municipal Agriculture Office (MAO) of San Roque. Then the researcher went to the farmers who conducted an interview personally with the farmers who were included in the list of the selected barangays. The researchers prepared a structured questionnaire to be used in the data gathering and submitted to their adviser for some corrections and suggestions. After the revision, the researchers were personally went to the selected respondents to interview and answer the questionnaire and it was followed and verified by some personal questions/interview in order to have an accurate information.

Results and Discussion

Table 1 presents the number of respondents important's situation according to sampling sites. Eighty-five (85) were cassava and sweet potato producers identified and utilized as respondents of the study. It shows that 17.64% of respondents were from Coroconog and Bantayan

and 14.12 were from Balnasan, 12.95% were from Pagsang'an, 11.75% were from Balud, 10.59% were from Malobago, 5.89% were from Ginagdanan and Dale, 3.53% were from Lawaan, San Roque, Northern Samar. It indicates that most of the cassava and sweet potato producers came from Bgry. Coroconog and Bantayan, Northern Samar.

Table 1. Number of respondents according to barangay

Barangay	Frequency	Percentage
Bantayan	15	17.64
Coroconog	15	17.64
Balnasan	12	14.12
Pagsang'an	11	12.95
Balud	10	11.75
Malobago	9	10.59
Dale	5	5.89
Ginagdanan	5	5.89
Lawaaan	3	3.53
Total	85	100%

SOCIO DEMOGRAPHIC PROFILE

Age of Respondents. The age of respondents ranged from 20 to 80 years old as presented in Table 2. Its shows that most of the respondents were from 40-44 years of age with 24.70%, followed closely by bracket 35-39 years old with 20%, 30-34 with 17.65%, 45-49 with 15.29%, 50-54 with 10.59, 55-59 with 7.06% and 60-64 with 4.71%. It also shows that the average age of cassava and sweet potato producers even at the old age of 50 above were able to do work with this kind of production and were skilled in planting root crops. It indicates also that they had gained experience in such production.

Gender. Table 3 shows that male dominated the production of cassava and sweet potato with 87.06 % of total number of producers over female, with only 12.94 %. The study shows that with this kind of agricultural production, manual labor is really for male.

Marital Status. Table 4 shows that most of the cassava and sweet potato producer were married (77.65%), 4.70% were widow, 17.65% were separated. It implies that majority of the farmers engaged in this agricultural production were married.

Educational Attainment. Table 5 shows that most of the respondents (40%) were elementary graduates, 37.64% were high school graduates and 22.36% were college graduates. This means that most of the respondents who were engaged in cassava and sweet potato production were those that did not attain higher level of education.

Monthly Income. The monthly income of the respondents ranged from 1,000 to 3,000 pesos as shown in Table 6. The respondents with 77.64% had 1,000 to 1,500 monthly incomes followed by 11.76%, 1,000-2,000 monthly income; and 22.35% had 2,000-3,000 monthly income. It indicates that the cassava and sweet potato producers belonged to low-income group.

Source of income. Table 7 shows that a majority of the respondents' (64.70%) source of income came from cassava and sweet potato, followed by 62.35% from rice, 48.23% from copra, 43.53% from vegetables and 23.53% came from fishing. Most of the farmers were not only engaged on single source of income. They were involved in different kinds of production and livelihood.

Number of households. Table 8 shows that most respondents (42.35%) had 1-9 family members, followed by 32.94% with 9-12 members, 18.82% had 12 members above and 5.88% had 1-3 members. Eventually, the farmers of cassava and sweet potato have a big family who need another source of income to sustain the basic needs of the family.

Table 2. Distribution of respondents according to age

Age	Frequency	Percentage
30-34	15	17.65
35-39	17	20.00
40-44	21	24.70
45-49	13	15.29
50-54	9	10.59
55-59	6	7.06
60-64	4	4.71
Total	85	100%

Table 3. Distribution of respondents according to gender

Gender	Frequency	Percentage
Male	74	87.06
Female	11	12.94
Total	85	100%

Table 4. Distribution of respondents according to marital status

Marital status	Frequency	Percentage
Married	66	77.65
Widow	4	4.70
Separated	15	17.65
Total	85	100%

Table 5. Distribution of respondents according to educational attainment

Educational Attainment	Frequency	Percentage
Elementary graduate	34	40
High School graduate	32	37.64
College graduate	19	22.36
Total	85	100%

Table 6. Distribution of respondents according to monthly income

Monthly Income	Frequency	Percentage
1,000-1,500	56	65.88
1,001-1,500-2,000	19	22.35
2,000-3,000	10	11.77
Total	85	100%

Table 7. Distribution of respondents according to source of income

Source of Income	Frequency	Percentage
Copra	41	48.23
Rice	53	62.35
Fishing	20	23.53
Cassava and Sweet potato	55	64.70
Vegetables	37	43.53
Total	206	242.34%

*This a multiple response

Table 8. Distribution of respondents according to family members

Family members	Frequency	Percentage
1-3	5	5.88
1-9	36	42.36
9-12	28	32.94
12 above	16	18.82
Total	85	100%

Profile of Cassava and Sweet Potato Production

Figure 1. Cassava and sweet potato vines

Tuber Produced

As shown in Table 9 most of the respondents (80%) planted both cassava and sweet potato, followed by 11.77% cassava, and 8.23% sweet potato. This shows that the farmers were capable to plant both cassava and sweet potato rather than planting one root crop only. Planting both cassava and sweet potato can help them have a bigger income.

Table 9. Planted root crops

Root crops	Frequency	Percentage
Cassava	10	11.77
Sweet potato	7	8.23
Both	68	80
Total	85	100%

A. Location

As shown in Table 10, the location of most of the farmers (76.47%) was upland, followed by 23.53%, lowland. Majority of the farmers said that it is much better to plant in upland area rather than lowland area based on their observation.

Table 10. Distribution of respondents according to location

Location	Frequency	Percentage
Upland	65	76.47%
Lowland	20	23.53%
Total	85	100%

B. Land tenure

As to land tenure (Table 11), most of the respondents (57.64%) were tenants, followed by (42.36%) owners. This indicates that most of the farmers were tenants rather than owner. It is because some owners are professional, so they were busy with their work and cannot focus so much to their own farm.

Table 11. Distribution of respondents according to land tenure

Land Tenure	Frequency	Percentage
Owner	36	42.36
Tenant	49	57.64
Total	85	100%

C. On Land Area

Table 12 shows the land area planted with cassava and sweet potato most respondents 68.24% had 1 ha, followed by 21.18% had ½ ha, and 10.69% had 2 ha. Majority of the farmers had 1 ha land area even it is small quantity of land but they were able to utilize and sustain the production of cassava and sweet potato within the municipality.

Table 12. Distribution of respondents according to land area

Land area	Frequency	Percentage
½ ha	18	21.18
1 ha	58	68.23
2 ha	9	10.69
Total	85	100%

D. Production Practices

Table 13 shows that a majority (92.94%) of the respondents used different varieties of cassava and sweet potato followed by 7.06%, native variety. It implies that the respondents were comfortable and it's best to used the other variety based on their experienced to plant cassava and sweet potato rather than native and indigenous variety.

Table 13. Variety of cassava and sweet potato

Variety of cassava And sweet Potato	Frequency	Percentage
Native	6	7.06
Other variety	79	92.94
Total	85	100%

Months to plant Cassava and sweet Potato

Table 14 presents the months to plant cassava and sweet potato; March with 75.30% and followed by April 24.70%. This indicates that the farmers plant during summer season which is from March to April. Based on the farmers observation it is much better to plant root crops in summer or dry season because it has a higher survival rate and the root crops are not affected by insect and plant diseases.

Table 14. Distribution of respondents according to planting months

Planting months	Frequency	Percentage
March	64	75.30
April	21	24.70
Total	85	100%

Harvesting months

Table 15 shows the harvesting months with 68.23% (September) and 31.77% by (August). It indicates that cassava and sweet potato were harvested from August to September and during summer season. These crops were commonly used for different delicacies served during different occasions.

Table 15. Distribution of respondents according to harvesting months

Harvesting Months	Frequency	Percentage
August	22	31.77
September	58	68.23
Total	85	100%

Preparation for planting material

Table 16 shows the preparation for planting material. Majority (67.06%) used both cutting and shoot. (17.64%) used cutting and 15.30% used shoots. It indicates that using cutting and shoot is more comfortable and the best planting material to use.

Table 16. Preparation for planting material

Planting Material	Frequency	Percentage
Cutting	15	17.64
Shoot	13	15.30
Both	57	67.06
Total	85	100%

Source of materials/variety

Table 17 shows the source of materials/variety used by the farmers; 64.71% came from co-farmers, 27.05% from the Brgy, 8.24% from the Municipality. Majority of the farmers share their planting materials and variety to use in the production.

Table 17. Farmers source of material/variety

Source of Material/Variety	Frequency	Percentage
Farmers	55	64.71
Municipality	7	8.24
Barangay	23	27.05
Total	85	100%

Average weight produced per hectare

Table 18 shows the average weight produced per hectare with 74.12% by 100-150 kgs, followed by 20% by 50-100 kgs and 5.88% by 150-200 kgs. Majority of the farmers produced 100-150 kgs weight of cassava and sweet potato.

Table 18. Average weight produced per hectare

Average Weight	Frequency	Percentage
50-100kgs	17	20
100-150kgs	63	74.12
150-200kgs	5	5.88
Total	85	100%

Harvesting time of cassava and sweet potato per cropping

Table 19 shows the harvest time; 68.24%, once; and 31.76%, twice. It indicates that the farmers of the cassava and sweet potato harvested only once or twice in a year. Based on their experience they did not have a chance to harvest it thrice a year.

Table 19. Distribution of respondents according to harvested time

Times harvested	Frequency	Percentage
Once	58	68.24
Twice	27	31.76
Total	85	100%

The cassava and sweet potato harvest period

The study reveals that almost, 100% of the farmers were ready to harvest their product within six months duration based on observation, experience and practices in production.

Post harvest method

Table 20 shows the post harvest method they practiced; 57.65% wrapping; 42.35 drying. It means that the farmers were comfortable to use wrapping and drying as the post harvest method.

Table 20. Distribution of respondents according to post harvest-method

Post harvest method	Frequency	Percentage
Drying	36	42.35
Wrapping	49	57.65
Total	85	100%

Cost And Return Analysis

Starting capital by the farmers

Table 21 shows that the starting capital of the majority of the respondents (500-1,000) 57.65%, followed by 42.35% (200-500). It indicates that the farmers of cassava and sweet potato need only a small capital which is affordable by every individual to sustain the production.

Table 21. Distribution of respondents according to starting capital

Capital (Pesos)	Frequency	Percentage
200-500	36	42.35
500-1,000	49	57.65
Total	85	100%

Sale per harvest

Table 22 shows the sale per harvest of cassava and sweet potato; 81.18% ranged from 5,000, followed by 18.82%. Maximum income per harvest by the farmers was worth 5,000 and sometimes 10,000. According to them they cannot reach 15,000 above income sales per harvest.

Table 22. Sale per harvest of cassava and sweet potato

Sale Per Harvest (Pesos)	Frequency	Percentage
5,000	69	81.18
10,000	16	18.82
Total	85	100%

Farmers profit per harvest

Table 23 shows majority of the farmers gained a profit per harvest with 81.18 is 5,000, followed by 18.82% or 10,000. It indicates that the

farmers of cassava and sweet potato had a profit of 5,000 up to 10,000 but did not achieve a higher profit which is 10,000 above.

Table 23. Farmers profit per harvest

Profit Per Harvest	Frequency	Percentage
5,000	69	81.18
10,000	16	18.82
Total	85	100%

Estimated annual gross sales in every harvest of cassava and sweet potato

Table 24 shows the respondents' estimated annual gross sales every harvest. Majority had 54.12% or 10,000, followed by 45.88% or 5,000. The maximum annual gross sales every harvest time of the farmers of cassava and sweet potato is 5,000 to 10,000 which belongs to low-income group. It means that the income is very low.

Table 24. Distribution of respondents according to annual gross sales

Annual Gross Sales	Frequency	Percentage
5,000 Above	39	45.88
10,000 Above	46	54.12
Total	85	100%

Estimated annual net profits

Table 25 shows the estimated annual net profit. A majority of the farmers (54.12%) had 10,000, followed by (45.88%) had 5,000. It indicates that the annual net profit of the farmers ranged from 5,000 to 10,000 which is really low in terms of income per year.

Table 25. Distribution of respondents according to annual net profit

Annual Net Profit	Frequency	Percentage
5,000 above	39	45.88
10,000 above	46	54.12
Total	85	100%

Expenses during the production

Table 26 shows the expenses during the production, that majority of the respondents 500 pesos spent for transportation, 1,000 pesos for land preparation. With the total amount of 1,500. It means that the farmers spent more on land preparation rather in the transportation in marketing their products.

Table 26. Expenses during production

Expenses	(Cassava)	(Sweet potato)	Amount
(Labor)Land Preparation	500.00	500.00	1,000.00
(Marketing)Transportation	250.00	250.00	500.00
Total			1,500.00

Cost and return analysis

Table 27 shows the average cost and return analysis of cassava and sweet potato. Based on the data gathered, with gross income Php.5,000 at most, the production cost would be approximately Php 1,500 for labor, transportation and other things needed and as result of a net income of Php. 8,500.

Table 27. Return of Investment

Gross Income per harvest (Php)	Production Cost (Php)	Net Income (Php)	ROI (Php)
5,000	1,500	3,500	233.34

Marketing

Selling of cassava and sweet potato

The data implies that 100% of the farmers sold the product as a source of income to finance the basic needs of the family.

The buyers after harvesting the cassava and sweet potato

Table 28 shows that a majority of the respondents (62.35%) sold their products to a middleman, while 28.24% sold these to retailers, and 9.41% to wholesalers. This shows that farmers sell it to the middleman for the reason that they can sell it within a short period of time so they are assured that the cassava and sweet potato are fresh when sold to the costumers.

Table 28. The buyers of cassava and sweet potato

Buyer	Frequency	Percentage
Middleman	53	62.35
Retailer	24	28.24
Wholesaler	8	9.41
Total	85	100%

Table 29 shows the mode of selling. A majority of them (50.59%) sold it by sack, followed by (49.41%) sold per kilo. It means that there is an assurance to sell it very fast with a short period of time, so that cassava and sweet potato will not be damaged.

Table 29. Mode of selling

Mode of Selling	Frequency	Percentage
By kilo	42	49.41
By sack	43	50.59
Total	85	100%

Mode of payment

Almost, all of the respondents 100% sold cassava and sweet potato on cash basis. This indicates that cash basis is still the best way to sell the product for the assurance that the farmers will be paid immediately. Cash basis is the common practice because the amount involved it is not much.

Selling price per kilo

The price of cassava and sweet potato per kilo ranged from 40 to 100 pesos per kilogram. It indicates that the farmers of cassava and sweet potato sold their product with a lower price. The only thing in the mind of the farmers is the saying “balik-puhunan” in order to buy immediately their basic needs. On the other hand , those who have access to the market of the municipality were the ones who had an opportunity to sell with higher price.

Sell per sack

Almost or 100% sold their product per sack at 300-500. The farmers of cassava and sweet potato sold it with a lower price so that their products will be sold right away in order not to damage the agricultural product and also to buy their family basic needs.

Discounts to the loyal costumers

Table 30 shows the discount given to the loyal costumer 36.47%; 25% discount, followed by 31.76; 20% discount, 25.89%; 15% and 5.88; 10% discount. It means that the farmers of cassava and sweet potato give discount to the costumers to stay loyal to them forever, for them a regular customer is so important for they can sell it faster.

Table 30. Distribution of respondents accordingly to discounted costumer

Discount	Frequency	Percentage
10%	5	5.88
15%	22	25.89
20%	27	31.76
25%	31	36.47
Total	85	100%

Buyers

Table 31 shows that majority of the buyers of the agricultural product with 81.18% came from Municipality, followed by 18.82 from Barangay. It indicates that cassava and sweet potato are being sold with the municipality only.

Table 31. The cassava and sweet potato buyers

Buyers	Frequency	Percentage
Within the barangay	16	18.82
Within the municipality	69	81.18
Total	85	100%

Supply of cassava and sweet potato to cater the costumers

The table 32 present that there is enough supply of cassava and sweet potato to cater the costumers/ people needs with 67.06% followed by 32.94% inadequate. It implies that farmers focused to their work and means of livelihood on producing cassava and sweet potato that's why the supply of root crop in San Roque is adequate the needs of the municipality.

Table 32. Supply of cassava and sweet potato to their costumers

Supply	Frequency	Percentage
Adequate	57	67.06
Inadequate	28	32.94
Total	85	100%

Supply of cassava and sweet potato in San Roque, Northern Samar

Table 33 shows that there is enough and adequate supply of cassava and sweet potato in San Roque Northern Samar with 82.36% and 17.64% were inadequate. The farmers of cassava and sweet potato in San Roque Northern Samar were one of the productive producers of cassava and sweet potato in Northern Samar, they can sustain enough supply within in the municipality, the farmers have the passion to plant these kind of agricultural product.

Table 33. Sustainable production in San Roque, Northern Samar

Sustainable Production	Frequency	Percentage
Adequate	70	82.36
Inadequate	15	17.64
Total	85	100%

Any support from government or other institutions in terms of financial or marketing regarding the cassava and sweet potato production

Table 34 shows that cassava and sweet potato farmers received support from government or other institutions in terms of financial or marketing with 80% and 20% did not received any support. Majority of the farmers received government financial support or knowledge in terms of marketing, because the government have a policy to support the farmers in production to improved and enhanced more to sustain the agricultural production within the Barangay and Municipality.

Table 34. Support from government or other institutions

Support from Government or other institution	Frequency	Percentage
Yes	68	80
No	17	20
Total	85	100%

The LGU conduct a seminar or training to barangay regarding the cassava and sweet potato production

Table 35 presents the LGU did not conduct a seminar or training in the Barangay regarding cassava and sweet potato production with 54.11% and 45.89% for the municipality conducted a seminar. The LGU must give time for that seminar or training to ensured cassava and sweet potato farmers become knowledgeable regarding how to market and to improved more the production those agricultural crops.

Table 35. LGU conduct a seminar or training in the barangay

LGU conducted seminar or training	Frequency	Percentage
With seminar	39	45.89
No seminar	46	54.11
Total	85	100%

Problems Encountered

The different problems listed in table 36 were the top problems faced by the cassava and sweet potato growers, were rated; extremely; very; moderately; slightly; and not at all, where not at all =5, slightly =4, moderately =3, very=2,and extremely=1.nBased on the information gathered from the respondents, the weather was the extreme problems that they were facing because Northern Samar as we all know is one of the typhoon prone region in the Visayas.

Credit or financial is another problem according to them because their income cannot sustain the needs of their family, as a matter of fact this

root crops is their only alternative source of income. Spoilage is ranked as the third major problems that they encountered in planting root crops, cassava and sweet potato has the short shelf life compare to other crops it need to market and consume at the short period of time. Transportation is another problem that they were facing, according to them it is difficult to travel their crops because of the distance of their home to market area and it cost large amount of money as a result it less their expected income. Plant disease is another problem that they are facing, most of the farmers are lack of knowledge on how to manage and control the disease that attacking their root crops as a result it decrease the amount of root crops produced

Table 36. Shows the problem encountered of the cassava and sweet potato farmers

Problems	Rate	Rank
Weather	5.20	1
Credit/financial	5.05	2
Spoilage	4.50	3
Transportation	3.20	4
Plant diseases	3.00	5
Total	20.95	

Conclusion and Recommendation

Based on the result of the study, the following conclusion were drawn. The cassava and sweet potato producers are usually male under the age of 40-44, married and elementary graduates: They have around Php 1,000-1,500 income monthly. Planting time of cassava and sweet potato Is between March and July, the best planting material to use were cutting and short. It is harvested within six months. The product needs monetary capital of approximately Php 500 up to Php 1,000, land preparation cost to produce 100-150 kgs of cassava and sweet potato to have sales of about Php 5,000 and have a profit of around Php 10,000 above. Weather, financial concern, spoilage, transportation plant diseases are the major problems encountered by the farmers.

Based on the results of the study, the following recommendations were drawn. The farmers of San Roque is one of the cassava and sweet potato producer in Northern Samar it also be introduced to other municipalities as an additional income to the farmers. It would also be great to introduce these commodities to the farmers who are not involved on cassava and sweet potato production. Cassava and sweet potato producers should be educated is regards the different management and practices applicable for tubers to improve the production. A study on yield and growth using organic fertilizer should be conducted and

introduced to the farmers. Due to lack of available processed product out of cassava and sweet potato, part of recommendation is the innovation to create new products from these commodities that might add to its value. Further studies on market and economic stability of cassava and sweet potato are recommended to enhance the knowledge about the stand of commodities in economic aspect. And lastly, similar study should be conducted in other municipalities for further validation of this study's findings.

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