

BIBLIOGRAPHY

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ABSTRACT

This study confined itself in documenting the social and economic dimensions of sugarcane production and processing in the municipality of Quirino, Ilocos Sur. It was conducted from November, 2010 to January, 2011 at Barangays Malideg, Lamag, Banoen and Patiacan. Most (13.5%) of the respondents were either from barangay Malideg or from barangay Lamag. The respondents were 19 sugarcane producers and processors.

The management employed by the respondents was traditional. Renewal and non-renewal of sugarcane plants were employed by the farmers because of farm landscape or niche. Most of the activities were done by family members, thus, labor cost is non-cash.

Majority of the respondents were processing in Bangbangkag, Malideg where processing area for sugarcane in Quirino was first located. Moscuvado (tagapulot) was the main product because it is used as sweetener, substitute for commercial sugar. The sales they obtained in the production and processing of sugarcane has a significant contribution in acquiring the daily needs of the farmers and their family, since all of the respondents have no sources of livelihood other than farming. The average net income produced by sugarcane farmers with a land area of at

least 50 square meters and above was P21, 419 pesos a year with a return on expense of 2.4% which means that in every peso spent, a return of P240 pesos is obtained.

The major problems encountered by the respondents in the production of sugarcane were pests like rats. Limited technology and lack of materials used respectively were the major problems in processing, while market price and outlets were the common problems in marketing.



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INTRODUCTION

Rationale

Sugarcane production is one of the sources of livelihood in some barangays in Quirino, Ilocos Sur. Quirino, a fourth class municipality, is one of the twenty interior towns of the province of Ilocos Sur. It is bounded on the east by Besao and Tadian, Mt. Province, on the west by Gregorio del Pilar, Ilocos Sur, on the south by Cervantes, Ilocos Sur, southwest by Sigay, Ilocos Sur, and on the north by Tubo, Abra and San Emilio, Ilocos Sur. Sugarcane farmers in Quirino make different processed products out of sugarcane. Commonly, they process it as *tagapulot* (moscuvado). They also make *inti* (sugarcane syrup) and *balikutsa* (sugar cake which is whitened through stretching it occasionally). The rejected sugarcane stalks are processed into sugarcane wine (*basi*) and eventually as sugarcane vinegar.

Dizon stated in her 2009 report that the taste of *basi* differs depending on what fermenting agent or starter culture a *basi* maker will mix on the juice. In Naguilian, La Union, they use 'Chinese cake' (known as bubod) as a starter culture, while in Ilocos Norte, Pangasinan, and some part of Ilocos Sur use *samak* (*Macharanga grandifolia* Linn., *M. tanarius* Linn.) leaves, fruits, and bark. But in Quirino, where *samak* tree is unavailable, they use pigeon pea leaves and branches. Furthermore, processors sometimes put pineapple peelings as additive.

In extracting the juice of sugarcane, the method used is called '*Dapil*'. The one year old stalks of sugarcane are crushed in an iron rollers attached to a long pole tied to a carabao that moves around to operate the extractor or to move the rollers. The extracted juices are accumulated in a '*sinublan*' (large iron pan) where it is cooked. The *bagasse*



(fibrous part of the sugarcane which is left after extracting the juice) are dried and used as firewood mixed with dried bamboo.

Moreover, the aim of this study was to document all the processes and practices involved in sugarcane production and processing done in some barangays in Quirino, Ilocos Sur. It is hoped that the results of this study would help those sugarcane processors in the decision making and eventually gave them idea to obtain more profit in sugarcane production.

Statement of the Problem

The study aimed to answer the following questions:

1. Where are the sugarcane production areas in Quirino, Ilocos Sur and what are the production practices?
2. What are the processed products produced from sugarcane? What are the processing practices?
3. Where are the market outlets?
4. How much cost incurred and income derived from the product?
5. What are the problems encountered in the production and processing of sugarcane?

Objective of the Study

The study aimed to:

1. Identify the sugarcane production areas in Quirino, Ilocos Sur and the production practices.



2. Determine the processed products out of sugarcane, and the processing practices done.
3. Identify the market outlets of the processed products.
4. Determine the cost incurred and the income derived from the products.
5. Identify the problems encountered in the production and processing of sugarcane.

Importance of the Study

This study was conducted to show the processes involved in the production and processing of sugarcane and also the marketing and distribution of processed products. The result would serve as a basis for decision making for households or entrepreneurs who wants to go into this kind of business. It also seeks to provide information needed for sugarcane growers to meet the demand and requirement of consumers. It would also serve as basis for other researchers.

Scope and Delimitation

The study confined itself in documenting the social and economic dimensions of sugarcane production and processing in the sugarcane producing areas in Quirino, Ilocos Sur.



REVIEW OF LITERATURE

The Crop

Sugarcane is a tall perennial grass of the genus *Saccharum* (family *Poacea*, tribe *Andropogoneae*). Originally, the genus was created by Linnaeus with 2 species, namely, *S. officinarum* (cultivated species) and *S. spontaneum* (wild species). The noble cane or *S. officinarum* is the species referred to when sugarcane is spoken of (PCARRD, 2001). It is one of the most [efficient photosynthesizer](#) in the [plant kingdom](#). It is a C-4 plant, able to convert up to 2 percent of incident solar energy into biomass (Henderson, 2000).

The most common reproduction method is stem cutting. Each cutting must contain at least one bud and the cuttings are sometimes hand-planted. In more technologically advanced countries like the United States and Australia, [billet planting](#) is common. Billets harvested from a mechanical harvester are planted by a machine which opens and recloses the ground. Once planted, a stand can be harvested several times; after each harvest, the cane sends up new stalks, called [ratoons](#). Successive harvests give decreasing yields, eventually justifying replanting. Two to ten harvests may be possible between plantings (Anonymous, ND.).

Sugarcane Industry in the Philippines

Sugarcane was grown as a subsistence crop in the Philippines long before it was exported. Nicholas Loney, a British businessman, was the first to recognize its potential as an export crop. He brought in machinery for sugar production in the 1850s. By the 1860s, Negros Occidental was the leading sugar producing province in the Philippines. It is on its way to becoming the “sugar bowl of the Philippines” (Henderson, 2000).



Early export started by the middle of the eighteenth century when there was more than enough sugar produced to meet domestic demand. Sugar was exported to China (1755), India and China (1788), England (1795), and the United States (1756). The Philippines was the largest exporter of sugar in Asia from 1775 to 1779.

More sugar production was exported during the nineteenth century when large tracts of land were devoted to the planting of sugarcane in Central Luzon, following the end of the galleon trade between Mexico and Manila. Wealthy merchants were encouraged to buy large tracts of land to produce export crops, including sugar, on a commercial basis. It was also during the period when the focus of production of sugar began to shift south to the Visayas, with Negros surpassing Luzon as the major source of Philippine sugar (PCARRD, 2001).

In 2005, about 6 percent of the sugar produced was exported to the United States under a trade quota system, with 4 percent going to other regions. The rest of the produced was consumed locally (Anonymous, 2005).

Sugarcane Processing

In commercial sugar making, the cane first goes through a washer, then is cut into small pieces by revolving knives. The cut pieces may then be shredded or moved to crushers directly. The crushers consist of two large grooved rollers mounted horizontally, one above the other. The crushed macerated cane then goes through three or more roller mills which consist of grooved rollers with heavy hydraulic pressure maintained on the upper roller. Water, equal to 20 percent, is added before the mixture is passed through each set of rollers. Efficient mills extract at least 90 percent sugar in the cane.



In indigenous method called “*dapil*”, the sugar sap, without mixing water, is boiled for eight hours to become sugar. Loads of pine wood or dried bamboo is used as firewood. In the process, whitish residues called *usab* are spooned off every now and then from the surface of the vat and placed in another container. These collected fluids are locally used by farmers as pesticides. The extract is further boiled which is eventually placed in coconut bowls which is left to cool off as sugar cakes called *inti*, or these may be spread in a winnower (*biga-o*) and cut in sugar cakes preserved for every use. Moreover, in making sugarcane wine (*basi*) the boiled sugarcane extract after three – hour boiling is placed in jars (*charay*) for fermentation. A preservative/flavoring called *kalasang* is mixed with boiled sugarcane extract (Dizon, 2009).

New Varieties of Sugarcane

According to Sarian (2010), Philsurin has released three new high yielding sugarcane varieties. PSR 00 – 34 is tall, self-dethrashing and has medium to fairly big stalks. It is fast growing, resistant to smut and rust diseases, and has a cane yield of 118 tons per hectare. One ton of canes will produce an average of 2.11 50-kilo bags of sugar or 248.98 bags of sugar each weighing 50 kilos. This variety is recommended for dry areas. PSR 00-343 is tall with fairly thin to medium, cylindrical, brownish purple stalks. It has the advantage of very good germination and heavy tillering, resulting in high tonnage of 120 tons cane per hectare with each ton yielding 2.22 bags of 50 kilos, or a yield of 266.4 bags of sugar. This is highly resistant to smut and rust and resistant to yellow spot disease. PSR 00-161 has fairly thin to medium, cylindrical and solid stalks that tend to recline at harvest time. It exhibits good germination, heavy tillering, fast



growth, self detrashing, and sparse flowering characteristics. It has higher sugar yield over any of the check varieties in 7 out of 12 locations. Yielding 113 tons cane per hectare, each ton yields 2.24 bags of sugar of 50 kilos each. It is very highly resistant to rust and moderately resistant to yellow spot disease.



METHODOLOGY

Locale and Time of the Study

The study was conducted from November, 2010 to January, 2011 at Barangays Malideg, Banoen, Lamag and, Patiacan in the Municipality of Quirino, Ilocos Sur. These barangays were the major producers of sugarcane in the said municipality.

Respondents of the Study

The respondents were the sugarcane growers and processors of the above mentioned Barangays who were operating at least 50 square meters or more. There were 19 farmers who belonged to this category, thus they served as the respondents of the study.

Table 1 shows the distribution of the respondents in terms of Barangay address. Majority of the respondents were either residents of Malideg or Lamag. Others were from Banoen and Patiacan.

Table 1. Distribution of the respondents according to barangay

BARANGAY	FREQUENCY	PERCENTAGE
Malideg	6.00	31.50
Lamag	6.00	31.50
Banoen	4.00	21.00
Patiacan	3.00	16.00
TOTAL	19.00	100.00



Data Gathering Procedure

Data were gathered using survey questionnaires. A follow up interview was done to validate the data. Some of the production and processing practices were documented using digital camera.

Data Gathered

The data gathered were on the respondents' personal profile, production and processing practices, the kinds of product produced, economic data such as cost incurred and income derived in production and processing, and problems encountered in the production, processing, and marketing.

Data Analysis

Data were analyzed using frequency analysis and other appropriate statistical tools. Cost and return analysis was used in determining the productivity of the enterprise in terms of returns to investment or expenses.

RESULTS AND DISCUSSION

Respondents of the Study

Table 2 shows the general information about the 19 respondents in terms of age, civil status, educational attainment, and number of years in operation.

Age. In terms of age, several (37%) fall under the age bracket of 41–50 followed by 51–60 (32%). The findings imply that the production and processing of sugarcane is managed by middle aged to senior farmers.



Civil status. All the respondents were married.

Educational attainment. Majority (68%) of the respondents reached elementary level while 32% reached high school. None of the respondents have attended any college course or vocational courses. This implies that the respondents have attended formal education but none have reached college level.

Number of years in operation. Forty seven percent of the respondents were engaged in the production and processing of sugarcane for 1–10 years, followed by those (26%) with 11–20 years. However, it could be noted that 11% were into the said business for more than 30 years.

The result implies that sugarcane production is not a new enterprise in the area. The enterprise had started more than 30 years ago. Thus, in terms of experience in production, the farmers had already the skills and substantial experience, however, the production and processing technology was still traditional or indigenous practice.

Table 2. Respondents' personal profile

PARTICULARS	FREQUENCY	PERCENTAGE
Age		
30 and below	1	5
31 -40	1	5
41 – 50	7	37
51 – 60	6	32



61 – 70	3	16
71 & above	1	5
TOTAL	19	100
Civil status		
Married	19	100
TOTAL	19	100
Educational attainment		
Elementary	13	68
High school	6	32
TOTAL	19	100
Number of years in operation		
1 – 10	9	47
11 – 20 years	5	26
21 – 30 years	3	16
31 & above	2	11
TOTAL	19	100

Sugarcane Production Method

Table 3 presents the methods employed by the respondents in the production. Sugarcane production was done manually by the farmers. Two production methods were employed depending on the farm landscape or micro niche. Farm areas which are near the river were suited for renewals because of the abundance of water. On the other hand, farm areas which are elevated were suitable for non-renewals because area were unirrigated. The table shows that 68% of the respondents were renewing the sugarcane



plants while 32% were not. The renewal of sugarcane plants means higher yield and higher production cost while the non-renewals had a lower cost of production but also lower yield.

Labor Utilization and Cost in Sugarcane Production

Table 4 shows the labor utilization and cost incurred by the farmers. Hiring of labor in the production is done only during harvesting where activities or work is so intense. Others hire during land preparation and planting. Three or 16% of the respondents said that family labor was utilized in harvesting the sugarcane, while 84% hired laborers. Since activities on cultural management/crop maintenance require less labor, then most activities were done by family members. Some farmers do not practice weeding of sugarcane crops. Moreover, most of the costs incurred were non-cash.

Table 3. Sugarcane production method

METHOD EMPLOYED	FREQUENCY	PERCENTAGE
Renew	13	68
Do not renew	6	32
TOTAL	19	100

Table 4. Labor utilization and cost

ACTIVITIES	SOURCE OF LABOR				LABOR COST Pesos per day
	FAMILY		HIRED		
	F	%	F	%	
Land preparation	12	63	1	5	280 – 300
Planting	12	63	1	5	180 – 200
Irrigation	19	100	-	-	-



Weeding	6	32	-	-	-
Harvesting	3	16	16	84	-

*Multiple response

Tools/Farm Implements Used

In Table 5, majority (79%) of the respondents used indigenous tools in land preparation such as plow. Farmers who used plow in land preparation have smaller area cultivated. On the other hand, 21% of the respondents who have wider land areas rented tractors to ease the work. In irrigation, 68% used watering can, 21% used water pump and 11% used Japanese hose.

Majority (84%) of the respondents rented large iron pan and extractor in processing. Only 16% owned an extractor with iron pan. Sixty three percent owned jars that were used in making sugarcane wine and vinegar, and 37% were renting.

The result shows that tools/farm implements used were traditional such as the plow and watering can for irrigation. This factor would depend on the type of farm landscape and micro niche and the size of the farm.

Table 5. Tools / implements used by the respondents

TOOLS / IMPLEMENTS	OWNED		RENTED	
	F	%	F	%
Land preparation				
Plow	15	79	-	-
Tractor	-	-	4	21
Irrigation				



Japanese hose	2	11	-	-
Water pump	4	21	-	-
Watering can	13	68	-	-
Processing				
Extractor	3	16	16	84
Large iron pan	3	16	16	84
Jars	12	63	7	37

*Multiple response

Processing Area

Processing areas are where extractors were located. Table 6 presents the processing areas in Quirino, Ilocos Sur and the number of farmers processing in such area.

Three of the nine processing areas were located at Barangay Malideg, (2 in Bangbangkag and 1 in sitio Iteb). Forty seven percent of the respondents were processing in Bangbangkag and 5% in sitio Iteb. One processing area was located in Patiacan where 16% of the respondents process their products. In Barangay Lamag, there were five processing areas (3 iron extractors in Naspe, Inaop, and Napose, 1 iron extractor operated by wind mill in Bangko, and 1 wooden extractor in Lakbongan). Sixteen percent of the respondents were processing in Bangko, (11%) in Napose, and 5% in Naspi.

Table 6. Location of processing area

BARANGAY/SITIO	FREQUENCY	PERCENTAGE
Malideg		
Bangbangkag	9	47
Iteb	1	5
Patiacan		
	3	16
Lamag		



Napose	5	26
Naspi	3	16
Bangko	3	16
Inaop	4	21
Lakbongan	1	5

*Multiple response

Products Processed

Table 7 shows the products processed by the farmers and the corresponding prices. All the respondents were producing molasses (tagapulot) for household consumption and for sale. Twelve or 63% were producing sugarcane wine, 41% for vinegar, 16% were making sugarcake (balikutsa) and 11% were making sugarcane syrup (inti). The findings imply that the main product of sugarcane farmers in Quirino was moscuvado (tagapulot). This is because tagapulot is used as sweetener, substitute for commercial sugar.

The price of moscuvado (tagapulot) ranged between 60 – 70 pesos per ganta (approximately 2.5 kg/ganta), 50 – 60 pesos per liter for sugarcane wine and vinegar, sugarcane syrup (inti) at 35 – 40 pesos per liter and sugarcake at 15 pesos per ¼ kg.

Table 7. Sugarcane processed products and prices

PRODUCTS	FREQUENCY	PERCENTAGE	PRICES
Moscuvado (tagapulot)	19	100	P60.00 – 70.00/ganta
Sugarcane wine (Basi)	12	63	P50.00 – 60.00/liter
Sugarcane vinegar	8	42	P50.00 – 60.00/liter



Sugarcane syrup (inti)	2	11	P35.00 – 40.00/liter
Sugarcake (balikutsa)	3	16	P15.00 / ¼ kg

Marketing Practices

The marketing practices in terms of market outlet, classification of buyers, and mode of payment are presented in Table 8.

Market outlet. Almost all (95%) of the respondents sell products to walk in buyers. Only one of the respondents bring his products to sell in the public market.

Classification of buyers. The Table shows that all the respondents sold their products to individual buyers such as households in the area and neighboring barangays, and to visitors in the barangay.

Mode of payment. Majority (89%) of the respondents sold their products on cash basis. Two or 11% exchanged their products to other goods like edible seeds such as mungo seeds and pigeon peas, and rice especially glutinous rice (malagkit). This explains why some farmers said that there is no specific amount of profit or no profit at all in sugarcane production.

Table 8. Marketing practices of the respondents

PARTICULAR	FREQUENCY	PERCENTAGE
Market outlet		
Walk in buyers	18	95
Public market	1	5



TOTAL	19	100
Classification of buyers		
Individual/households	19	100
TOTAL	19	100
Mode of payment		
Cash	17	89
Barter	2	11
TOTAL	19	100

Income Derived from Sugarcane Production and Processing

The average income derived from sugarcane production and processing is presented in the cost and return analysis in Table 9. Costs were classified into fixed and variable costs. Variable costs included cash and non-cash costs. Cash costs were expenses from wages of labor, and non-cash were the value (opportunity cost) of planting materials (salog) and the value (opportunity cost) of family labor utilized in the production. The fixed cost was the depreciation cost of the farm tools/implements, computed using straight – line method. The average annual gross income is P30, 334.31 pesos. Net income is P21, 419.00. The return on expense is 2.4% which means that in every peso spent, a return of 240 is obtained. The return on above cash cost P27, 734 pesos. This means that the returns generated from cash spent is P27, 734 pesos. The returns on non cash cost which is P25, 584 pesos is the returns generated from non cash spent such as family labor and costs of planting materials.

Table 9. Average annual cost and return analysis of sugarcane producers and processors in Quirino, Ilocos Sur. (3, 000 – 8, 000 sq. meters)

PARTICULAR	AMOUNT (P)
I. Sales	39, 250



II. Variable costs		
Cash variable cost		
Hired labor	2,600	
Non cash variable cost		
Family labor	2,750	
Planting materials	2,000	
Sub total		7,350
III. Fixed costs		
Depreciation costs	1,566	
Sub total		1,566
IV. Total costs		8,916
V. Gross income		30,334
VI. Net income		21,419
VII. Returns on expenses		240
VIII. Returns on cash expense		824
IX. Returns on above cash cost		27,734
X. Returns on above non cash cost		25,584
XI. Returns on above variable cost		22,984

Social and Economic Dimensions

Though it is not the major source of livelihood in Quirino, Ilocos Sur, sugarcane production and processing has a significant contribution to the dwellers. Many farmers in barangay Malideg, Lamag, Banoen and Patiacaan were engaged in such business. Farmers in Malideg and Banoen were utilizing “bangkag” for their production. These areas were not utilized for rice production (as it is the main product in Quirino) because they were not irrigated. Moreover, farmers in Lamag and Patiacaan utilized sloping areas as plantation for they were used in *kaingin* system. These areas are marginal and were not utilized for high value crop production.



As the prices of commercial sugarcane products increases, farmers prefer producing products like sugar for their own consumption to save the money obtained for other livelihood activities such as rice production, piggery. Hired laborers and sugarcane farmers could save much from using these products. Instead of spending cash from buying the commercial sugarcane products, they could just rely on their produce and save the money for other goods needed by the household.

Also, considering the chemical contents of products, own produce is much safer because farmers do not mix any chemicals such as phosphoric acid, calcium hydroxide, and sulfur dioxide to their produce. According to Ament (2009), refined sugar, white or brown, literally has zero nutritional value – no minerals, no vitamins, no fiber, no enzymes, no fats – nothing of value for the body. Instead it provides toxic substance to the body. Some of the health problems related with sugar that Ament stated in his article is diabetes, asthma, arthritis, cancer (cancer cells feed on sugar), cataracts, dermatitis, gallstones, kidney stones, obesity, osteoporosis, and many others. In addition, acetic acid is mixed with commercial vinegar while the vinegars produced by the farmers in Quirino were fermented naturally or no chemical was mixed which made them safer for consumption.

Moreover, moscovado is important to the dwellers of Quirino, Ilocos Sur because they are fond of having coffee and cooking sweet foods/snacks such as “inpidas”, “tinudok”, “tambo – tambo”, and others. The aroma and taste of moscovado is better than the refined sugar, thus, consumers prefer using it.

The result implies that several benefits could be derived from this livelihood activity. The utilization of own produce is much better than purchasing commercially



produced like white sugar and commercial vinegar which is processed using chemical additives.

Savings from not purchasing commercial goods is an economic benefit-producing safe food products for the family and the community.

Problems Encountered in Production, Processing, and Marketing

Production problems. The most common problem encountered by sugarcane farmers in the production of sugarcane plants were pests like rats. All the respondents agreed on this matter. These rats destroyed sugarcane stalks which resulted to poor quality of sugarcane products and lesser volume of produce. Another identified by farmers were animals like cow, carabao and horse problem which eat and destroy sugarcane plants. This was one of the reasons why some sugarcane farmers in barangay Malideg and Banoen stopped planting sugarcane and preferred planting tobacco. These animals do not eat tobacco leaves, thus, higher profit is expected. Table 10 also shows that 37% of the respondents cited natural calamities as one of the problems encountered.

Processing problems. Majority (63%) of the respondents mentioned that lack of technology was the most common problem in processing. Processing is still done the traditional or indigenous method. The products vary in quality because farmers depend only on what they saw others had done and on their own experiences. Eleven or 58% of the respondents added lack of materials to use as problem and 42% cited the lack of financial assistance for the improvement of materials used in the processing and improvement on the quality of products produced.

Marketing problems. The Table also presents the marketing problems of the respondents. The problems identified by the respondents include low market price (58%),



no specific market outlet (32%), and limited buyers (16%). In addition, some people, especially relatives of the farmers asked for the products for free. This resulted to less and almost no profit gained for the farmers. This was also another reason why some had stopped planting sugarcane. There was no buyer of raw sugarcane or sugarcane stalks because there was no sugar plant in the place, unlike in other provinces like Tarlac where they have the Hacienda Luisita Azucarera as buyer.

Table 10. Problems encountered by the respondents

PARTICULAR	FREQUENCY	PERCENTAGE
Production		
Pests	19	100
Other animals	11	58
Natural Calamities	7	37
Processing		
Limited technology	12	63
Lack of materials used	11	58
Lack of financial assistance	8	42
Marketing		
Low market price	11	58
No specific market outlet	6	32
Limited buyers	3	16

*Multiple response



SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study confined itself in documenting the social and economic dimensions of sugarcane production and processing in barangays Malideg, Lamag, Banoen, and Patiacaan in the municipality of Quirino, Ilocos Sur. Most (31.5%) of the respondents were from barangays Malideg and Lamag. It was conducted from November, 2010 to January, 2011. The respondents were 19 sugarcane producers and processors.

The respondents' ages were widely distributed. Many (37%) of the respondents belonged to the age bracket 41–50 years. All were married. As to educational attainment, majority (68%) reached elementary level while 32% reached high school. Most (47%) of the respondents were engaged in production and processing of sugarcane for about 1–10 years.

Two production methods were employed by the respondents. Sixty eight percent were renewing the sugarcane plants while 32% were not. Since most of the activities in cultural management were done by family members, most labor cost is non–cash. Hiring of labor in production is done during harvesting where activities are so intense, thus, majority (84%) of the respondents hired laborers. Five percent of the respondents hire 1 or 2 laborers in land preparation and planting. Except for the extractor and large iron pan, most of the tools used in production and processing were owned by the farmers. Eighty four percent of the respondents rented an extractor with iron pan.

Most (47%) of the respondents were processing in Bangbangkag, Malideg. All the respondents were producing sugarcane (tagapulot) while 63% for sugarcane wine (basi). Ninety five percent of the respondents sell their products at home to walk in buyers such



as individual households in the area and visitors. Majority (89%) sells their products on cash basis; some (11%) exchanged their products to other goods like edible seed (mongo, pigeon pea seeds) and glutinous rice (malagkit).

Considering the prices and chemical contents such as phosphoric acid, calcium hydroxide, sulfur dioxides, and acetic acid, of commercial products, own produce is more economical and safer for consumption.

Pests such as rats were the most common production problem encountered by the farmers. Others include: other animals like cows and horses, and, natural calamities. Limited technology and lack of materials used, respectively, were the most common problem in processing, while low market price and limited or no market outlets were the common problems in marketing.

Conclusions

The following conclusions were drawn based on the findings of the study.

1. Barangay Malideg, Lamag, Banoen, and Patiacan were the sugarcane production areas in Quirino, Ilocos Sur. Sugarcane production is done in marginal areas, not suited for high value cash crops.

2. The main product of sugarcane farmers in Quirino were moscuvado (tagapulot). Other products were sugarcane wine (basi), sugarcane vinegar, sugarcake (balikutsa), and sugarcane syrup (inti). Indigenous or traditional method of processing is employed.

3. The only buyers of sugarcane products are household consumers in the area and visitors or local tourists.



4. Majority of the cost incurred in production and processing were non cash cost. Average net income derived was P21, 419 pesos.

5. Pest such as rats is the major problem in sugarcane production. Limited and lack of technology and seasonality of raw materials used were other problems identified. The low market price and limited outlets were the major problems in marketing.

Recommendations

1. The municipal government should look for agencies that could render technical assistance to sugarcane farmers for them to improve the production performance and the quality of their products. Moreover, the government should support such livelihood as a way of promoting production of safe foods, assist in market link and promote the product to invite buyers as a way to encourage production.

2. The farmers should develop packaging materials for their products for them to attract more buyers and place a higher value to their produce. A market outlet for sugarcane products should be designated in the municipal public market.



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APPENDICES**APPENDIX A**

Communication Letter

November, 2010

Sir/Madam,

Warm greetings!

I am a graduating student of Benguet State University taking up Bachelor of Science in Agribusiness major in Enterprise Management. As part of the course requirement, I am presently conducting an undergraduate research study entitled “PROCESS DOCUMENTATION ON THE SOCIAL AND ECONOMIC DIMENSIONS OF SUGARCANE PRODUCTION AND PROCESSING IN THE MUNICIPALITY OF QUIRINO, ILOCOS SUR”.

In connection with this, may I ask you to fill up or answer the questionnaire made for this purpose? Rest assured that all the information you will provide will be treated with utmost confidentiality. Your favorable approval is highly appreciated.

Thank you for your kindness and cooperation. May God bless you!

Sincerely yours,

ANTONIA A. BUMITLING

Noted by:

JOVITA M. SIM



APPENDIX B

Interview Schedule

Name: _____ Age: _____ Civil Status: _____

Barangay Address: _____

What sugarcane livelihood? Please check the box.

- Sugarcane Producer Sugarcane Grower and Processor
 Sugarcane Processor

A. Production

- Do you own the land? () Yes () No If no, how much cost do you incur in using the land? _____ (rent per year).
- Total farm area _____
- Total area devoted for sugarcane production _____
- What are the production practices and the labor costs you incurred in every cropping year for sugarcane? Please check the practices done and fill up the table.

Activities/practices	Manhours / Mandays			Labor cost per MH/MD		
	Family	Hired	Machine	Family	Hired	Machine
1. Land preparation:						
() weeding						
() plowing						
() others						
2. Planting						
3. Irrigation						
4. Fertilizer application						
5. Weeding						
6. Harvesting:						
() Top cutting (Ponglaw)						
() Stem cutting (Tabas)						
() others						
7. other activities, specify						
a.						
b.						
c.						
d.						

5. Tools and Equipments used (Please state by filling the table below)

Item	Quantity	Year Bought	Unit cost	Life span
1. Land				



preparation tools / equipments:				
() tractor				
() plow				
() others, Specify				
a.				
b.				
2. Planting tools / equipments:				
() planting machine				
() others, specify				
a.				
b.				
3. Irrigation implements:				
() Japanese Hose				
() water pump				
() others, specify				
a.				
b.				
4. Processing tools and equipments:				
() Large iron pan				
() others, specify				
a.				
b.				
c.				

B. Processing



1. Where is your processing area? _____

2. What sugarcane products do you process?

Product	Quantity per time	Price per unit
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
i.		
j.		

C. Marketing

1. Who are the buyers?

Products	Market Outlet	Classification of Buyers
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
i.		
j.		
k.		

2. What are the problems you encountered in the production?

Problems

Reasons:

_____ Natural calamities

() Typhoons

() Drought

() others, specify

_____ Lack of irrigation

_____ Lack of technology

_____ others, specify

3. What are your suggestions in solving these problems?



4. What are the problems you encountered in the processing?
Problems Reasons:

_____ Lack of technology	_____
_____ Lack of materials used	_____
_____ Availability of financing	_____
_____ Others, specify _____	_____

5. What solutions do you suggest for these problems?

6. What are the problems you encountered in marketing?
Problems Reasons:

_____ Low market price	_____
_____ Lack of financial assistance	_____
_____ Limited buyers	_____
_____ Competition among farmers	_____
_____ Distance to market center	_____
_____ Others, specify _____	_____

7. What are your suggestions in solving these problems?



APPENDIX C

Photo Documentation



Planting Materials called “Salog” (Sugarcane tops). These are soaked first in water for several days until roots will sprout before planting.





Sugarcane planted in a “bangkag” located in Malideg, Quirino, Ilocos Sur





Sugarcane plantation in Lamag, Quirino, Ilocos Sur.



Harvesting of sugarcane



Sugarcane plantation. Canes were already harvested. Canes were not replanted, thus, *ratoons* (new stalks) were left for the next harvest.



Iron extractor operated by a carabao



An iron extractor located in Napose, Lamag, Quirino, Ilocos Sur operated by a Carabao.



“Anawang” – where the extracted juices of sugarcane were cooked.



An iron extractor operated/run by wind mill. Located at Bangko, Lamag, Quirino, Ilocos Sur



“Java” variety of sugarcane



Farmers in Quirino call this variety of sugarcane as “Hawaiian”.



Extracted sugarcane juice.



Sugarcane juice placed in a “*sinublan*” (large iron pan) ready to be cooked.





Moscuvado ready for drying



Dried moscovado sugar