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# Coconut Production in Northern Part of Surigao del Sur, Philippines: Baseline Data for Establishing a Coconut Oil Mill

Jillard O. Mercado

*Surigao del Sur State University, College of Business and Management, Jillard O. Mercado, Cantilan, Surigao del Sur, Philippines*

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**ABSTRACT**

The main purpose of the study is to assess the coconut production in the six municipalities of the Province of Surigao del Sur, Philippines as basis in establishing a coconut oil mill that might alleviate income of the coconut farmers in the area as their ready market. Descriptive Survey methods was used in the study, questionnaire was the main tool used for gathering the data. The respondents were three hundred eighty two coconut farmers. Results shows that in coconut farming the knowledge in production by the respondent was inherited to their ancestors. Fertilization under brushing was very extremely implemented. Pest and diseases control the cultural method was used. Harvesting cycle from 90 days period or quarterly using climbing method. Copra drying method smoked or "tapahan" was used. Training and seminar related to coconut production is needed to improved and attain the high quality as needed for the coconut oil mill.



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## INTRODUCTION

Coconut farming is the dominant economic activity in rural Philippines. It is one of the country's major economic basis and mainly done by small landholders and few coconut plantations. Among the major agricultural commodities in Surigao del Sur only four (4) crops posted significantly stake under the regional perspective, namely: coconut, coffee, abaca, and soybean. The 2010 copra production in the province contributed 45.80 percent to the regional copra production; 75.60 percent for green coffee beans; 67.50 percent for abaca fiber and 100 percent for soybean production (Aragon, 2010).

Despite this important contribution, Balisacan (2002) revealed that the coconut farmers are among the lower strata in the agricultural communities in the country. Coconut farmers face low and highly fluctuating prices due to their inability to have access to profitable markets for their produce and high farm inputs costs.

In order to alleviate income in coconut farming communities, the policy initiatives should focus on providing assistance to farmers towards addressing their market. Oil is another market opportunity for coconut. Coconut oil is consumed in tropical countries for thousand years. In this way, the consolidated information can serve as a motivation to establish a Coco oil mill. The establishment of this industry will utilize the coconut production of the local farmers into coconut oil. Through this, coconut farmer can increase their income on the availability of coco oil as their ready market of coco production. But no study was conducted yet, and this is the reason that the researcher was prompted to undertake this study in order to assess the possibility of the establishment of coconut oil mill.

The study likewise identified coconut farmers of Carrascal, Cantilan, Madrid, Carmen, Lanuza and Cortes, Tandag that need support for capitalization to make their enterprise notable and rewarding at the commercial level.

Finally, this study is a worthwhile undertaking that could be used in helping coconut farmers alleviate their status to become self-sufficient.

***Objective of the Study:***

The main purpose of this study is to assess the extent of implementation of coconut production in the Northern part of Surigao del Sur, Philippines, as baseline data for establishing a coconut oil mill.

***Significance of the Study:***

The result of this study serves as the bases of information for raw material used to supply in the establishment of coco oil mill. This will help

**Corresponding Author:** Jillard O. Mercado, Surigao Del Sur State University, College Of Business And Management – Cantilan Campus, Cantilan, Surigao Del Sur, Philippines 063-083-212-5309, 09463551735.
E-mail: Jkoy1981@gmail.com Postal Address; Pag-antayan, Cantilan, Surigao del Sur, Philippines 8317

alleviate the economic stability of coco farmers as their ready market.

***Methodolgy:***

***Research Design:***

The study made used of the descriptive normative design. The design was deemed appropriate because the study involved the collection of the data concerning the current condition. The coverage is one year back before the study.

***Setting and Respondents:***

***Setting:***

The locale of the study comprised the seven (7) Municipalities of Surigao del Sur, namely: Carrascal, Cantilan, Madrid, Carmen, Lanuza, Cortes and Tandag. Coconut trees are planted abundantly in this aforementioned municipalities remained untapped for industrial growth due to lack of investment and insufficient funds. They are accessible by land, water, air and are connected by a farm to market road network which is almost ninety (90) percent cemented.

***Respondent:***

The utilization of 438 respondents made the researcher to believe that the pertinent and relevant data furnished by the said respondents would definitely satisfy the information sought in the study.

Respondent were taken from the secondary data of Philippine Coconut Authority Provincial office of Surigao del Sur for the number of coconut farmers in the area under study. In obtaining the sample of respondents, proportional stratified random sampling was done by the use of the lottery or fish bowl technique to obtain the representative sample of the coco farmers after it was computed by Slovin's formula.

***Research Instrument:***

A questionnaire was the main tool for data gathering. It was especially designed to suit the group of respondents. Questions are made simple and easy to understand and provided with various possible answers for schematic recording of answer.

***Validation of instrument:***

The questionnaire was presented to the Personnel from Philippine Coconut Authority as expert for comments and suggestions.

***Data Gathering Procedure:***

The researcher asked a permit to conduct the study from the municipal mayors of the seven municipalities and from the barangay captains of the barangays where the respondents reside after which arrangement were made on how administration of questionnaire could be done by barangays. The respondents were given questionnaires in their respective location. The researcher sought the help of the barangay officials, relatives and friends in the collection and retrieval of the questionnaire but he personally collected most of them, a week after its distribution.

***Presentation, Analysis and Interpretation of Data:***

The Personal profile of the coconut farmers is found in Table 1. On the age level of the coconut farmers of the seven (7) municipalities of Surigao del Sur. The following data are offered: most of the respondents range from ages 36 to 50 years old which rank to be number one. These age level categories are considered as seasoned coconut farmers and have worked for quite number of years in the farm. According to Magat (2006), these age level category are capable of continuing the coconut farming with a desire to improve their economic situation.

Table 1 shows also that among of the coconut farmer respondents, 323 respondents or 85 percent are male and 59 respondents or 15 percent are female. This means that farming profession is dominated by men because of the bulk of work.

In terms of civil status, 323 respondents or 85 percent are married. The findings reveal that the majority of the coconut farmers who are married have greater responsibility at home, and this affects their effectiveness.

As seen in Table 1 below, 309 respondent or 81 percent have zero to five members in the household. In spite of no household has more than ten members, findings show that coconut farmers are still besieged with poverty due to high cost of living. This conformed with the findings of Barrios (2010) that coconut farming is characterized by a large member of farm households using traditional technology without modern inputs. The government support is necessary to address the market development needs of the coconut farmers in order to reduce poverty in coconut farming community.

Table 1 reflects that 23 respondents or six percent had no formal education. This implies that this group inherited knowledge in coconut farming from their ancestors. Findings revealed that the majority of the respondents are high school and college graduate. Hyman (1988) as cited by Aragon, et. al. (2000) disclosed that knowledge and intelligence are correlated with educational attainment. Thus, farmers with high educational attainment tended to have better production than those with lower educational attainment.

The data in the table revealed that 367 respondents or 96 percent with 0-5 children are going to school. This implies that the respondents tried their best to send their children to school no matter how hard life is because they value education.

In terms of tenurial status of the coconut farmers, data reveals that 160 respondents or 42 percent are tenants. It can be said, therefore, that most of the coconut farm is tenanted and innovation

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to improve coconut production is far from their idea of the owner. Punchihewa, et al. (2009) stressed out that coconut farming is mainly done by small landholders and few coconut plantations exist.

**Table 1:** Socio Economic Profile of the Coconut Farmers as to Age, Sex, Status, Number of Household Members, Education, Number of Children going to School and Tenurial Status

| Indicator | Categories | Respondents | | |
|---|---|---|---|---|
| | | F | % | Rank |
| Age | 36-50 yrs. Old | 135 | 35 | 1 |
| | 51-65 yrs. Old | 131 | 34 | 2 |
| | Above 65 yrs. Old | 80 | 21 | 3 |
| | 21-35 yrs. Old | 36 | 10 | 4 |
| | Total | 382 | 100 | |
| Sex | Male | 323 | 85 | 1 |
| | Female | 59 | 15 | 2 |
| | Total | 382 | 100 | |
| Civil Status | Married | 323 | 85 | 1 |
| | Single | 30 | 8 | 2 |
| | Widow | 29 | 7 | 3 |
| | Total | 382 | 100 | |
| Number of Household Members | 0-5 members | 309 | 81 | 1 |
| | 6-10 members | 73 | 19 | 2 |
| | Total | 382 | 100 | |
| Education | High School Graduate | 88 | 23 | 1 |
| | College Graduate | 80 | 21 | 2 |
| | Elementary | 76 | 20 | 3 |
| | College Level | 73 | 19 | 4 |
| | High School Level | 38 | 10 | 5 |
| | No Education | 23 | 6 | 6 |
| | Post Graduate | 4 | 1 | 7 |
| | Total | 382 | 100 | |
| Number of Children going to School | 0-5 Children | 367 | 96 | 1 |
| | 6-10 Children | 15 | 4 | 2 |
| | Total | 382 | 100 | |
| Tenurial Status | Tenant | 160 | 42 | 1 |
| | Owner Cultivation | 138 | 36 | 2 |
| | Share Holder | 50 | 13 | 3 |
| | Administrator | 34 | 9 | 4 |
| | Total | 382 | 100 | |

Table 2 presents and explains the economic profile of the coconut farmers as to the total coconut farm cultivated by each respondent. Among the varying size of the farmland under cultivation of coconut, the average area 1 to 2 hectares obtained the highest percentage. Most of which are located in the mountain side (more than 300 meters above sea level). The total nuts production per hectare below 2,000 and average copra production per hectare declined to below 1,000 kg. Another observation was that, the old farmers leave the management of the coconut farms to their sons, son in law and relatives, but they still retain the power to decide on what to do with the coconut plants.

It is evident from the table that majority of the respondents, 309 out of 382 of them or 81 percent sell their copra to the local buyers. This is consonance to the findings of Deomampo (2012) that the local vendors were found to be the most contracted and used channel by the farmers for selling their coconut. Of which the prevailing price mostly sought by the 191 respondents or 50 percent is 21 pesos to 30 pesos and only few of the respondents could sell below 10 pesos and above 30 pesos.

**Table 2:** Economic Profile of Coconut Farmers as to Total Coconut Farm Cultivated, Total Production per Hectares and Average Copra,Production per Hectare, Harvesting Period, Copra Buyers and Price per Kilo

| Indicator | Categories | Respondents | | |
|---|---|---|---|---|
| | | F | % | Rank |
| Total Coconut Farm Cultivated | 1-2 hectares | 136 | 36 | 1 |
| | Below 1 hectare | 104 | 27 | 2 |
| | 2.1 - 3 hectares | 87 | 23 | 3 |
| | Above 3 hectares | 55 | 14 | 4 |
| | Total | 382 | 100 | |
| Total Production per Hectare | 2,000 nuts below | 275 | 72 | 1 |
| | 2,001-3,000 nuts | 65 | 17 | 2 |
| | 3,001-4,000 nuts | 27 | 7 | 3 |
| | Above 4,000 nuts | 15 | 4 | 4 |
| | Total | 382 | 100 | |
| | Below 1,000kg | 302 | 79 | 1 |

| | | | | |
|---|---|---|---|---|
| Average Copra Production per Hectare | 1,001-2,000 kg | 65 | 17 | 2 |
| | Above 3,000kg | 15 | 4 | 3 |
| | Total | 382 | 100 | |
| Copra Buyers | Local Buyers | 309 | 81 | 1 |
| | Traders | 73 | 19 | 2 |
| | Total | 382 | 100 | |
| Copra Price per Kilo | 21 – 30 pesos | 191 | 50 | 1 |
| | 11 - 20 pesos | 138 | 36 | 2 |
| | Above 30 pesos | 38 | 10 | 3 |
| | Below 10 pesos | 15 | 4 | 4 |
| | Total | 382 | 100 | |
| Seasonal Price of Copra | Yes | 340 | 89 | 1 |
| | No | 42 | 11 | 2 |
| | Total | 382 | 100 | |
| Month of Copra High Price | October – December | 244 | 64 | 1 |
| | July – September | 73 | 19 | 2 |
| | April – May | 38 | 10 | 3 |
| | January – March | 27 | 7 | 4 |
| | Total | 382 | 100 | |
| High Price of Copra per Kilo | 21-30 pesos | 264 | 69 | 1 |
| | Above 30 pesos | 76 | 20 | 2 |
| | 11-20 pesos | 42 | 11 | 3 |
| | Total | 382 | 100 | |
| Month of Low Price | April – June | 233 | 61 | 1 |
| | July – September | 65 | 17 | 2 |
| | January – March | 42 | 11 | 3 |
| | October – December | 42 | 11 | 4 |
| | Total | 382 | 100 | |
| Low Price of Copra per Kilo | 11 – 20 pesos | 313 | 82 | 1 |
| | Below 10 pesos | 42 | 11 | 2 |
| | 21 – 30 pesos | 27 | 7 | 3 |
| | Total | 382 | 100 | |

The table also reveals that according to 340 respondents or 89 percent the price of copra is seasonal. The month with a high price of copra falls in October to December it ranges from 21 pesos to 30 pesos. April to June is the leanest month for the price of copra. The price is proportionally affected to as low as 11 pesos to 20 pesos per kilo and even as low as 10 pesos. This follows the "Law of Supply", that when the supply is high the price is low and when it is low, the price is high. Sultoni (2004) asserted that the peak harvest season in the Philippines for crops is from April to July of the year and price is affected.

Table 3 presents the extent of implementation of coconut production in Carrascal, Cantilan, Madrid, Carmen, Lanuza, Cortes and Tandag City in terms of Trainings and seminars, fertilization, pest and diseases, harvesting and copra drying method. Training and Seminars is a must for the coconut farmers. The data displayed on the table 3, has the same qualitative meaning as "moderately implemented" by the respondents though the components have different average mean of 2.36, 2.54, 2.67, 2.32, 2.40 and 2.46 respectively, can be observed.

The over - all findings as to trainings and seminars as shown in table 3, was interpreted as "moderately implemented" (2.46). This implies that experienced, supplemented with knowledge gained from attending trainings and seminars is important to prepare coconut farmers better to tackle the business of coconut production. Bhorat, et.al (2011) cited that through trainings and seminars are not only expected to keep themselves abreast with new knowledge but also to evaluate what is going beyond the scope of the implementation

As to Fertilization, the table below illustrated the extent of implementation of coconut production. It can be seen that the respondents practiced under-brushing weeding as it evidently obtained the highest average mean of 4.22 described qualitatively as very extensively implemented.

Weeds affect the growth and productivity of palms because this competes for nutrients in the soil. Also, this may attract other pest, plaques, pathogens and diseases which may be detrimental to the health of coconut palms (Philippine Journal of Science, 2013).

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**Table 3:** Extent of Implementation of the Coconut Production of Carrascal, Cantilan, Madrid, Lanuza, Cortes, and Tandag City in terms of Training and Seminars, Fertilization Pest and Diseases Control, Harvesting and Copra Drying Method

| Indicators | Categories | Weighted Average Mean | Qualitative Description |
|---|---|---|---|
| Trainings and Seminars | On identification of suitable lands for coconut production | 2.36 | Moderately Implemented |
| | On planting techniques/farming practices from fertilization to harvesting | 2.54 | Moderately Implemented |
| | Basic crop management, control pest and diseases | 2.67 | Moderately Implemented |
| | Product development, quality control and marketing | 2.32 | Moderately Implemented |
| | Intercropping | 2.40 | Moderately Implemented |
| | Latest Technology for copra drying | 2.46 | Moderately Implemented |
| | Over-all | 2.46 | Moderately Implemented |
| Fertilization | Using Organic fertilizer (natural) | 3.81 | Extensively Implemented |
| | Using Sodium Chloride (Common Salt) | 2.94 | Moderately Implemented |
| | Combination of Organic and Inorganic fertilizer | 3.33 | Extensively Implemented |
| | Underbrushing weeding | 4.22 | Very Extensively Implemented |
| | Mulching of the main root zone of coconut | 2.78 | Moderately Implemented |
| | Over- all | 3.42 | Extensively Implemented |
| Pest and Diseases Control | Cultural Method | 3.64 | Extensively Implemented |
| | Mechanical Method | 2.13 | Moderately Implemented |
| | Biological Method | 2.12 | Moderately Implemented |
| | Chemical Method | 2.34 | Moderately Implemented |
| | Over-all | 2.56 | Moderately Implemented |
| Harvesting | Harvest nuts at 11-12 month of age | 3.98 | Extensively Implemented |
| | Harvesting cycle from 90 days period or quarterly | 4.74 | Very Extensively Implemented |
| | Harvesting by using Pole Method | 2.41 | Moderately Implemented |
| | Harvesting by using Climbing Method | 3.69 | Extensively Implemented |
| | Over-all | 3.71 | Extensively Implemented |
| Copra drying Method | Hot Air or Mechanical Method | 1.57 | Less Implemented |
| | Sun Drying Method | 2.87 | Moderately Implemented |
| | Smoked or Tapahan | 4.68 | Very Extensively Implemented |
| | Mixed | 2.81 | Moderately Implemented |
| | Over-all | 2.98 | Moderately Implemented |
| | ∑X and Qualitative Description | 3.03 | Extensively Implemented |

The use of organic fertilizer or natural fertilizer alone and the combination of organic fertilizer and inorganic fertilizer have the same qualitative description of extensively implemented but with varying average means such as 3.81 and 3.33

However, using a sodium chloride (common salt) and mulching of the main root zone of coconut got the lowest mean of 2.94 and 2.78 respectively.

The over - all perception of the respondents in terms of fertilization as to the extent of implementation of coconut production was 3.42, meaning extensively implemented. Namuco (2011) stressed that the adequate fertilization during the early years encourages vigorous growth, early bearing and high initial yields.

In terms of pest and diseases control Table 3 presents how the respondents controlled the occurrence of pest and diseases of coconut. Disease development most commonly occurs often period of heavy rains. Early detection is essential for successful control and the use of cultural method is widely used with the highest mean of 3.64 interpreted qualitatively as extensively implemented.

The over- all response of the respondents in terms of pest and diseases control was interpreted as moderately implemented, 2.56. This means that they shared similar practice, the collect-and-destroy method in controlling pests and diseases. The method is deemed to be less expensive.

Shown in Table 3 also the extent of implementation of coconut production by the respondents as to harvesting. It is done throughout the year. But many respondents preferred the harvesting cycle from 90 days period or quarterly. This has the highest mean of rating of 4.74 described qualitatively as very extensively implemented followed by harvesting of nuts at 11 to 12 months age with an average mean of 3.98 meaning extensively implemented. The nuts were harvested by skilled climbers or may be cut from the ground using a knife attached to a long pole. Using this method the respondents can be checked and cleaned the crown of the palm for pest and diseases.

The over-all perception of the respondents on the extent of contribution as to harvesting was qualitatively interpreted as extensively implemented. The data gathered support for the capabilities of the coconut farmers.

On Copra Drying Method, the data presented in table 3 reflects the extent of implementation of coconut productions as to copra drying method used by the respondents. The method with the highest average mean was through smoking or using “tapahan” with 4.68 interpreted as very extensively implemented. Tapahan was followed by Sun Drying

with an average mean of 2.87 and the mixed of all methods of copra drying of 2.81. Both have similar qualitative interpretation of moderately implemented. The lowest average mean was using hot air or mechanical method of 1.57 qualitatively described as less implemented. It implies that when coconut meat is dried too rapidly at a high temperature, it becomes scorched and the oil extracted from it will be discolored.

The over –all mean as to copra drying method was 2.98 meaning moderately implemented. The data gathered on this factor revealed the quality of copra. Castellanos (2003) pointed out that the continued use of the "tapahan" method of drying copra despite the development of other copra dryers such as the kukum dryers and the Los Baños multicrop dryer also account for the poor quality of copra. This traditional method of drying copra is considered labor intensive, increasingly expensive and result in the presence of toxic substances such as afflatoxin, which is unsafe for human consumption.

***Based on the findings of this study, the following conclusions were drawn and recommendations are offered:***

1. The respondents are predominantly male, at their maturity age and possess the minimum level of education capable of continuing their undertakings in coconut production.

2. The coconut farmers widely practiced fertilization and proper harvesting that result to a high yield. The reality prevails despite of the less emphasis accorded by the government in terms of trainings and seminars related to pest and diseases control and copra drying method.

***Recommendations:***

1. The main purpose of this study is to assess the extent of implementation of coconut production that serves as baseline data in establishing a coco oil mill that might alleviate income especially to the coconut farmers in the area under study and the government is suggested to stabilize the buying price of copra and increase in production.

2. Conduct trainings and seminars of new technologies on how to control of pest and diseases of coconut through high quality copra drying methods.

3. Establish a small scale oil mill in Cantilan, Surigao del Sur.

4. For further studies; conduct a feasibility study to determine the viability of the Establishment

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