

Production Practices and Harvesting Operations and Problems of Farmers in San Antonio, Nueva Ecija

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Abstract— The study aimed to identify the production practices, harvesting methods and harvesting problems encountered by farmers in San Antonio, Nueva Ecija. The descriptive method of research was used to describe the production practices and harvesting operations in terms of seed preference, preferred fertilizer, water source, planting operation, harvesting operation, sources of credit as well as the harvesting problems in terms of insect pests and diseases, low production, low price of Palay, and lack of post-harvest facilities. Results show that farmers preferred to use inbred seeds and inorganic fertilizer. Many of their rice fields are irrigated, coming from NIA. and more than half of the respondents are transplanting their crops. Furthermore, most of them use laborers in harvesting their crops, and almost all farmers depend on private individuals for credit. Also, the respondents often encountered problems which include insect pests and diseases, low production due to high cost of input and insufficient capital, and low price of Palay. In addition, many farmers agree that there are essential benefits of using modern technology in farming. It is recommended that farmers use the hybrid seeds as their input in planting their crops to increase their production and make use of machines in harvesting their crops to lessen their expenses and get credit to agricultural banks instead of private individuals avoiding higher interest rates.

Keywords— Production Practices, Harvesting Methods/Operations, Harvesting Problems, Farmers, San Antonio Nueva Ecija.

I. INTRODUCTION

The Philippine population would continue to grow, increasing from 76.5 million, as of the latest population census conducted in May 2000, to 141.7 million in 2040, according to the Medium Series of the 2000 Census-based population projections (PSA, n.d.). Nueva Ecija, the “Rice Granary of the Philippines” has the largest contribution to rice production. San Antonio is one of the rice producer towns in Nueva Ecija. Based on the initial interview conducted by the researchers, San Antonio produces 79,168.5 metric tons of rice during the dry season and 50,770.5 metric tons of rice in the Wet Season, respectively. A total of 10, 555.80 hectares are cultivated for rice production and become less rainy

days because some areas are submerged in water during this season. The annual rice production has increased significantly in recent years, decreased when there is a calamity.

San Antonio, Nueva Ecija is composed of sixteen (16) barangays; (13) are agricultural and only (3) are non-agricultural areas. About 66 percent of their total land areas are utilized as agricultural land. Farming is the bread and butter of San Antonio residents. They plant their crops twice a year from December to January and harvest it from April to May and their second crop from August to November. Nevertheless, most of the farmers plant only once, during the time of Dayatan (Summer Season) only, because it is riskier for them to grow during the wet season.

As per the initial interview conducted by the researchers, the Municipal Agriculture Office (M.A.O.-San Antonio) helps farmers by implementing projects such as giving subsidies for their seeds, fertilizers and pesticides in the mode of monetary discounts. The technicians of every barangay conduct orientation, meetings, discussions, and seminars to educate farmers and produce high-quality rice in San Antonio.

When the rice production encounters problems, specifically during harvesting season, they provide free seeds and fertilizer (abono/pataba) to the farmers who suffer from natural calamities and are damaged by insect pests and diseases. They also help the farmers to get insurance at the Philippine Crop Insurance Corporation (PCIC) Cabanatuan City to ensure their rice crops.

Nowadays, farming practices have changed using mechanical and heavy machinery or equipment instead of manpower to do agricultural tasks (Shamshiri et al.m 2018). Especially in harvesting their crops, some use combined harvester - thresher (“halimaw”) to make the harvesting process easier and faster.

The agricultural industry is also changing when it starts to use machinery rather than traditional farming methods. However, these changes in farming practices may affect several individual levels in society, especially those who will lose their jobs.

The study's general objective is to identify the harvesting operations of farmers in San Antonio and then identify the common problems that they encounter, especially during the harvesting season. Harvesting problems include high cost of input but the low price of palay, pests and diseases such as rats, Rice Black Bug (RBB), natural calamities such as floods, strong winds, El Niño and La Niña and most especially, lack of post-harvest facilities or lack of drying pavements, so they are forced to sell their newly- produced rice at a lower price even if they spend much on the inputs.

Statement of the Problem

The study aimed to identify the harvesting problems encountered by farmers in San Antonio, Nueva Ecija. Especially it sought to answer the following questions.

1. How may Production Practices and Harvesting Operations of Farmers be described in terms of;
 - 1.1 Seed Preference
 - 1.2 Preferred Fertilizer
 - 1.3 Water Source
 - 1.4 Planting Operation
 - 1.5 Harvesting Operation
 - 1.6 Sources of Credit
2. How may the harvesting problems encountered by farmers be described in terms of:
 - 2.1 Insect Pests and Diseases;
 - 2.2 Low Production;
 - 2.3 Low Price of Palay; and
 - 2.4 Lack of Post-Harvest Facilities?
3. What are the perceptions of farmers on the effects of using modern technology in farming?

II. METHODOLOGY

Research Method

The descriptive method of research was used in this study to analyzed the collected data and then summarized it

Research Locale

This study was conducted in San Antonio, Nueva Ecija, a flat terrain. The climate in this particular region has two seasons - dry and wet. San Antonio, Nueva Ecija is relatively flat, which is an ideal geographic area for rice production. It is divided into 16 barangays, 13 are agricultural area and about 66 percent of the total land area of San Antonio is utilized as agricultural land. The people of San Antonio primarily depend on rice farming. The 13 agricultural barangays in San Antonio are Papaya, San Jose, Buliran, Luyos, San Mariano, San Francisco (East and West), Lawang Kupang, Sta. Barbara, Maugat, Sta. Cruz, Cama Juan, Panabingan and Sto. Cristo.

Research Respondents

The researchers distributed questionnaires to the selected farmers in different barangays in San Antonio. The study respondents were composed of 100 farmers (given by their Research II Instructor) in different barangays. The questionnaires were adapted from prior studies on the same area but then revised and modified to fit the current situation and environment of the subject under study.

Sample Technique Used

Sampling is a process or technique of choosing a sub-group from a population to participate in the study; it is selecting a number of individuals for a lesson in such a way that the individuals selected represent the large group from which they were selected (Ogula, 2005). The total number of respondents that would be given a questionnaire which is 100 farmers was provided by their Research Instructor and is divided according to the number of farmers per barangay. The number of farmers per barangay is divided by the number of farmers in San Antonio multiplied by 100.

The Instrument

The researchers used the survey questionnaire as their instrument in collecting data. It was used as a tool in collecting data from their respondents because it reduced time and effort. The survey questionnaire was formulated to gather information on the profile of the respondents, production process and harvesting operations, harvesting problems encountered and the effects of using modern technology in farming. The questionnaire was divided into four parts. The first part described the profile of the respondents as to age, sex, educational attainment and types of ownership. The second part was about the production process and harvesting operation of farmers, the third part was the harvesting problems encountered and the last part of the questionnaire was the perception of farmers in the effects of using modern technology in farming.

Statistical Treatment

The information gathered through questionnaires was computed, treated, and analyzed using the following statistical formula. The first part was measured using the frequency distribution and percentage formula. For the questionnaire's second part, the data were analyzed through weighted means and the average weighted mean was also used. Lastly, the grand weighted mean was used to measure the effects of using modern technology in farming. The obtained weighted means were interpreted using the table of equivalent below.

Rating Scale for the Level of Contribution

Scale	Ranges	Verbal Interpretation
5	4.50-5.00	Strongly Agree
4	3.50-4.49	Agree
3	2.50-3.49	Uncertain
2	1.50-2.49	Disagree
1	1.00-1.49	Strongly Disagree

III. RESULT AND DISCUSSION

Production Practices and Harvesting Operations

Table 1. Seed Preferences of Farmers

Seed Preference	Frequency	Percentage
Inbred	51	51%
Hybrid	40	40%
Both	9	9%
TOTAL	100	100%

Table 1 presents the preferred seed of farmers in their rice crop production. The data shows that most of the respondents are inbred users with 51 or 51% and that 9 out of 100 respondents or 9% use both inbred and hybrid. The results indicate that most farmers prefer to use inbred seeds because it is cheaper than hybrid seeds. An Apayao farmer also chooses inbred seed because it is less costly than hybrid seeds (Regional Field Office, Cordillera Administrative Region, 2021).

Table 2. Preferred Fertilizers of Farmers

Fertilizer Preference	Frequency	Percentage
Organic	39	39%
Inorganic	47	47%
Both	14	14%
TOTAL	100	100%

Table 2 presents the preferred fertilizer of farmers in their rice crop production. The data shows that 47 or 47% of the respondents use inorganic fertilizer and those 14 out of 100 respondents or 14% use both organic and inorganic in fertilizing their crops.

The results denote that most farmers prefer to use inorganic fertilizer to be able to increase their production. According to the Basic of Gardening, (n.d.) farmers use inorganic fertilizers because it works immediately, contains all necessary nutrients that are ready to use, convenient to use and affordable.

Table 3. Sources of Water

Water Source	Frequency	Percentage
Irrigated (NIA)	65	65%
Rain fed	0	0%
Pump	35	35%
TOTAL	100	100%

Table 3 presents the water source used by farmers in their fields. The data shows that the source of water of many farmers comes from NIA (National Irrigation Association), which is irrigated and 65 or 65% of the respondents while 35% or 35 out of 100 respondents are using pumps.

The results signify that the source of water of the majority of the farmers is irrigated (NIA); this implies that the National Irrigation Association is fulfilling its job well.

Table 4. Farmers' Ways of Planting

Ways of Planting	Frequency	Percentage
Transplanting	55	55%
Direct Seeding	45	45%
TOTAL	100	100%

Table 4 presents the farmers' way of planting. The data show that most of the farmers use the transplanting method, making up 55 or 55% of the respondents and that 45 out of 100 or 45% of the respondents are still practicing the direct seeding method.

The result shows that most farmers transplant their rice plants because this will help increase their production and some are using direct seeding because they have no money to pay for the planter. Transplanting also ensures a uniform plant stand and gives the rice crop a head start over emerging weeds. Further, seedlings are established even if the field is not leveled adequately and has variable water levels. Transplanting may also allow crop intensification as the crop is in the main field for less time (IRRI, Rice Knowledge Bank, n.d.)

Table 5. Harvesting Method

Harvesting Method	Frequency	Percentage
Laborer	51	51%
Combine Harvester	33	33%
Reaper	16	16%
TOTAL	100	100%

Table 5 presents the harvesting method of farmers in San Antonio. The data shows that 51 or 51% of the respondents are using laborers in harvesting their crops and that 33 out of 100 or 33% of the respondents are using reaper. This implies that the majority of the farmers are still practicing the traditional way of farming, which is the use of laborer because they don't yet adapt the mechanization process of farming and besides they agree wherein a private individual will lend them money and they will be the one to harvest the rice crops and directly get the farmer's payment from it.

Another factor is that they still consider their co-farmers who will lose their job.

Table 6. Sources of Credit

Source of Credit	Frequency	Percentage
Private Individual	67	67%
Bank/Lending Institution	12	12%
No need on Credit	21	21%
TOTAL	100	100%

Table 6 presents the sources of credit of farmers. The data shows that most of the farmers depend on credit to private individuals, which comprises 67 or 67% of the respondents and that 12 or 12% of the respondents get their fund from any banking/lending institution. The results reveal that the majority of the farmers don't have the capital to finance their farm crops; they borrow money from private individuals while some are borrowing from banks resulting in an immediate selling of their crops to traders' right after the harvesting period resulting in the low price of palay.

Harvesting Problems Encountered

Table 7. Insect Pests and Diseases

Insect Pests & Diseases	Frequency	Percentage
Golden Apple Snail	79	43.4%
Weeds/Grass	62	34.06%
Other	41	22.53%
TOTAL	182	100%

Table 7 presents the insect pests and diseases that destroy their farm crops. The data shows that the major problem of farmers in insect pests and diseases is the Golden Apple Snail, which comprises 79 out of 100 respondents or equivalent to 43.4% of the total respondents and 41 of them or 22.53% classified them as other harvesting problems they encounter. The results showed that most farmers agreed that the Golden Apple Snail are the major insect pests they consider as harvesting problems as they eat the rice crops before they can reap it during the harvesting period. The result was supported by the article made by Sebastian (n.d.), that golden snail became a major pest of rice in the Philippines.

Table 8. Low Production

Production	Frequency	Percentage
50-70 cavans/ha.	31	31%
70-90 cavans/ha.	21	21%
90-110 cavans/ha.	23	23%

110-130 cavans/ha.	20	20%
Other	5	5%
TOTAL	100	100%

Table 8 presents the production of rice in San Antonio. The data shows that 31 or 31% of the respondents produce 50-70 cavans of rice per hectare and that 20% or 20 out of 100 respondents produce 110-130 cavans/ha. The results signify that most farmers focus on low production because they cannot sustain the necessary input needed in their rice crops due to financial problems encountered.

Table 9. Low Price of Palay

Price of Palay	Frequency	Percentage
10-15 Peso/kl.	38	38%
15-20 Peso/kl.	37	37%
Other	25	25%
TOTAL	100	100%

Table 9 presents the price of palay. The data shows that most of the respondents sell their palay within the range of 10-15 peso/kl. and that 37 or 37% of the respondents sell their palay at 15-20 peso/kl. The results denote that the price of palay is lower compare to the expenses they had incurred.

Table 10. Lack of Post-Harvest Facilities

Post-Harvest Facilities	Frequency	Percentage
Warehouse	21	17.5%
Solar Dryer	29	24.17%
Mechanical Dryer	6	5%
Other (Direct to Trader)	64	53.3%
TOTAL	120	100%

Table 10 presents the post-harvest facilities of farmers. The data shows that 64 or 64% of the respondents directly trade their palay to buyers and only 6 out of 100 respondents or 6% of the respondents use a mechanical dryer.

This implies that most farmers now sell their harvest crops to traders right after they harvest them because they don't have enough money to pay for the laborer who will dry up the palay from the sun. Another thing is that they don't have a warehouse to store their harvest crops. Besides, they still have to pay the loans they used in financing their crops. This results to the low price of palay, and their income is just enough as payment on their loans.

Perception of Farmers in the Effects of Using Modern Technology in Farming

Table 11. Farmers' Perception in the Effects of Using Modern Technology in Farming

Item Statement	WM	Verbal Interpretation
1. Ease on farming if modern machineries are used.	4.47	Strongly Agree
2. Effectiveness of modern machineries on farming.	4.45	Strongly Agree
3. Lighter work on farming when modern machineries will be used.	4.58	Strongly Agree
4. Increase in harvest and income in using modern machineries on farming.	3.98	Agree
5. Health hazard on my part when using new machineries on farming.	2.49	Disagree
6. Bigger deductions on my profit when harvesting period comes.	3.67	Agree
7. Gradual change on farmers' movement when using modern machineries.	3.76	Agree
8. As a farmer, my self-confidence will be lost when continuous use of modern machineries will be done.	2.47	Disagree
9. Noticeable negative effects on my co-farmers in using modern machineries.	2.39	Disagree
10. The use of new machineries is time-consuming especially if used not complementing on the right season.	2.49	Disagree
TOTAL	34.75	

Table 11 presents the effects of using modern technology in farming. The table shows item "Ease on farming if modern machinery is used" as the highest in rank with 4.47 weighted mean verbally interpreted as "Strongly Agree". On the other hand, item "Noticeable negative effects on my co-farmers in using modern machinery" has 2.39 weighted mean, which is verbally

interpreted as "Disagree". This implies that the major effects of using modern technology in farming are the ease, effectiveness and lighter work it gives to farmers when it comes to farming.

IV. CONCLUSIONS

The farmers preferred to use inbred seeds because it is cheaper than the hybrid, most are inorganic fertilizer users because it can help to increase their production. Many of their rice fields are irrigated, coming from NIA because they don't have a water pump. More than half of the respondents are transplanting their crops because that's the most effective way to increase their crops. Furthermore, most of them use laborers in harvesting their crops because they don't have machinery and equipment and almost all farmers depend on private individuals for credit because they don't have enough money to finance their farm.

The respondents often encountered problems in their crops which can greatly affect their production. The majority of these include insect pests and diseases such as golden apple snail, weeds, grass and others like tungro, low production due to high cost of input and insufficient capital, low price of palay because they directly sell their newly harvest crops to traders due to lack of post-harvest facilities.

Based on the perception of many farmers, they agree that there are essential benefits of using modern technology in farming with a grand mean of 3.5.

V. RECOMMENDATIONS

The farmers must use the hybrid seeds as their input in planting their crops to increase their production and make use of machines in harvesting their crops to lessen their expenses and get credit to agricultural banks instead of private individuals avoiding higher interest rates.

Through the Municipal Agriculture Office (M.A.O.), the government must provide agricultural credit facilities to farmers and help them in financing their farm by providing a much lower interest rate enabling them to supply the necessary inputs needed by the rice crops. They must also impose regular training and seminars or simply meetings or orientations to educate the farmers about the techniques required to avoid problems that they may encounter, such as the proper use of insecticides and pesticides.

The farmers should also practice using modern technology in farming to increase their production and make their work easier and faster.

REFERENCES

- [1] Albert P. Aquino, Virma Anne A. Lim and Princess Alma B. Ani, Republic Act 7607: Empowering Smallhold Farmers in their Economic Endeavors 2013-12-30
- [2] Basics of Gardening, (n.d.). Advantages and disadvantages of using inorganic fertilizers. <https://www.basicsofgardening.com/advantages-and-disadvantages-of-using-inorganic-fertilizers.html>
- [3] Bautista, V.L., The agricultural institution used heavy machineries in agriculture works, (Central Luzon State University, Science City of Munoz Nueva, Ecija 1997'98).
- [4] Bourbon, K. (2017, November 3). Nueva Ecija: The rice granary of the Philippines. Make Heritage Fun!. <https://www.makeheritagefun.com/palayan-city-a-hidden-gem-in-nueva-ecija/>
- [5] El Lithy A.M., Planting and method on rice productivity and farm machinery and power (University of the Philippines Baguio 2003).
- [6] IRRI Rice Knowledge Bank. (n.d.). Manual transplanting. <https://www.knowledgebank.irri.org/training/fact-sheets/crop-establishment/manual-transplanting>
- [7] Municipal Agricultural Office, San Antonio Nueva Ecija, The Perspective of Farmers in the Use of Modern Farming Machineries in Barangay San Francisco, San Antonio, Nueva Ecija, Philippines, (Central Luzon State University, Science City of Munoz Nueva, Ecija 2015'16)
- [8] Nguyen Cong Thanh¹ and Baldeo Singh² ¹Cuu Long Delta Rice Research Institute Head of the Division of Agricultural Extension, IARI, New Delhi, India; CONSTRAINTS FACED BY THE FARMERS IN RICE PRODUCTION AND EXPORT.
- [9] Ogula, P. (2005). Research Methods Nairobi Kenya. Catholic University of East Africa Publications.
- [10] Pamkhuila Shaiza, Agricultural problems faced by the farmers of India March 30, 201
- [11] Philippine Statistics Authority. (n.d.). Philippine population would reach over 140 million by the year 2040 (Final results from the 2000 census-based population projections) <https://psa.gov.ph/content/philippine-population-would-reach-over-140-million-year-2040-final-results-2000-census-bas-0>
- [12] Regional Field Office, Cordillera Administrative Region, 2021. Apayao rice farmers benefit from Da's hybrid seeds, fertilizers. (2021, February 16). Cordillera Administrative Region. <https://car.da.gov.ph/2021/02/apayao-rice-farmers-benefit-from-das-hybrid-seeds-fertilizers/>
- [13] "San Antonio, Nueva Ecija Profile". PhilAtlas. Retrieved August 14, 2020.
- [14] Sarda, P.S., Modernization of Rice Milling", the Modern Technology of Rice Milling, (EIRMA, p.20, 85 and 86. 1966).
- [15] Sebastian, Leocadio S. (n.d.). Management options for the golden Apple snail. The Apple Snail (Ampullariidae) Website. https://www.applesnail.net/pestalert/management_guide/pest_management.php#ref
- [16] Shamshiri, R.R.; Weltzien, C.; Hameed, I.A.; Yule, I.J.; Grift, T.E.; Balasundram, S.K.; Pitonakova, L.; Ahmad, D.; Chowdhary, G. Research and development in agricultural robotics: A perspective of digital farming. Int. J. Agric. Biol. Eng. 2018, 11, 1–14.