

# Status of Agricultural Food Sector: Basis for A Proposed Continuity Plan

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**Abstract**— This study described the status of agriculture in the province of Nueva Ecija. It determined the current situation of the farming business in Nueva Ecija in terms of agricultural land use, its statistical profile on agriculture, crops grown by cities and municipalities and the presence of support agencies in maintaining the continuous development of farming and other forms of agriculture therein.

Based on its agriculture profile, land, mostly irrigated shares the biggest portion in terms of its usage for food production. Rice, corn, onion and tomatoes are the major crops being grown in cities and municipalities. Findings revealed that rice and corn share the biggest in domestic consumption.

For support agencies, bank and business agencies are found in support for farmers while the government mostly provides seminars. It was also revealed that other seeds for crops are introduced as a farmer's option and lesser in choosing for an investment in their income. As their contingency plan, farmers opt to sell and engage in driving rather than farming during lean months. Pest attacks constitute the main problem encountered by farmers, while seeding management is a priority.

The above findings point to certain sustainability that requires improvement and a continuity plan to match up with the continuous supply of goods from the farms to the demands of an increasing population for its consumption.

**Keywords**— Agriculture profile, continuity plan, farming business, production and consumption, sustainable agriculture, support agencies .

## I. INTRODUCTION

Sustainability is considered in the agricultural sector is a vital component in our country's economics and labor. Based on the statistical data provided by the Philippine Statistics Authority in 2018, "agriculture grew by 1.80 % in the fourth quarter of 2018. Crops, livestock, poultry and fisheries contributed to the higher production during the quarter. At current prices, the gross value of agricultural production amounted to PhP 521.2 billion, higher by 4.05 % than the previous year's level". From January to December 2018, agricultural production increased by 0.56 percent. Crops production slightly increased by 0.25 percent. It accounted for 50.40% of the total agricultural output"[1].

Studying agriculture sustainability is very important. "Sustainable agriculture frequently encompasses a wide range of production practices, including conventional and organic. A regionally integrated system of plant and animal production practices are designed to produce long-term results such as a .production of sufficient human food, feed, fiber, and fuel to meet the needs of a sharply rising population; b. protection of the environment and expansion

of the natural resources supply; and c.sustainment of the economic viability of agriculture systems [2].

In the Philippines, Nueva Ecija, which is one of the agricultural provinces in the country is considered as the "Rice Granary of the Philippines" because of its endless farms dedicated to producing rice. It also has lands that produce other crops such as onion, mango, calamansi, banana, garlic, and different types of vegetables [3]. This farming business in the province aims to alleviate the poverty of the farmers and their families.

However, poverty in the province is not reduced through farming business solely as several lands are instead being devoted to some other business purposes such in manufacturing and textile industries. In Cabanatuan, one of the big cities in Nueva Ecija, the rise of subdivisions and conversions of agricultural lands for residential purposes have created a rippling effect as to its impacts on food security and supply.

Hence, a major concern of the researchers focuses on other factors affecting agricultural stability in the province and its cities to be able to make accurate and better decisions

[4] regarding the life and working conditions of the farmers.

By this context, this study has been conceived. This research aimed to describe the current situation of the agriculture or farming business in Nueva Ecija and identify the problems in the production and consumption of the crops that farmers produced as a basis for a proposed continuity plan that can harmonize with the continuous operation and development of sustainable agriculture in the province.

This study also considers how families in the Nueva Ecija heavily rely on their income from the crops they grow, reap and sell in the local markets. Such sustainability, although confronted with other problems, still requires protection, support and monitoring. The support for farmers for production of crops at these times and as was in the past are continuously faced by some various concerns and issues, especially so that supply of water during dry spell or El Niño phenomenon and the conversions of lands for residential purposes affect the areas for cultivation of crops and other means of agricultural production. Each of which requires support and monitoring. Studying and exploring [5] certain factors that affect the day to day agricultural activities must be done to reconcile with the most appropriate solutions which aimed to reduce the difficulties [6] of the farmers in their farming business. A continuity plan is important. Much more than this, it requires a prospective view of how farming business fares in the cities and the rest of the province and how farmers live with the income they gain from agricultural activities.

To have sustainable agriculture, farmers need to increase soil fertility and improve land productivity in sustainable ways. This may include the appropriate use of fertilizers, planting different types of crops each season, and using techniques to avoid unnecessary plowing.

## II. METHODOLOGY

The research method used in the study is a descriptive design. According to [7] descriptive theory is a set of propositions that attempts to describe something. Additionally, according to [8], as cited by the authors in [9] and [10], descriptive research systematically describes a situation, problem, phenomenon, service or program, attitude toward an issue or simply, it provides information on a subject.

The researchers have selected staff of the Office of the Provincial Agriculturist. Ten (10) farmers were chosen as respondents for the validation of other information relevant

to the objectives of this study. This is done to complement other information not indicated in the profile of the agriculturists and also to serve as other resources of information for proposing a continuity plan.

The major instruments used to gather information and data were the researchers-made interview, questionnaire and questionnaire checklists.

The data gathered were all tabulated and analyzed by the researchers and explained after every table. Frequency analysis and percentage analysis were used. The most common responses or the modal frequency expressed in percentage was used to describe the responses of farmers as respondents.

## III. RESULTS AND DISCUSSION

### 1. Agricultural Profile

#### 1.1 Agricultural Land Use

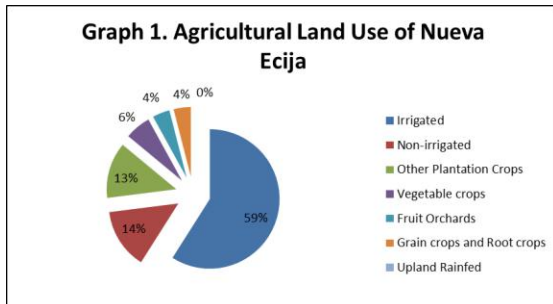
Table 1. Present Land Use in Nueva Ecija (Area and Percentage)

Land Use	Area (has)	Percentage (%)
Agricultural Areas	276,741.50	50.25%
Forest Land	123,412.50	22.41%
Grazing and Pastures	65,354	11.87%
Others (Institutions/open space)	50,410	9.15%
Residential and Commercial	30,514	5.54%
Freshwater swamps and fishpond area	4286	.78%
<b>Total Land Area</b>	<b>550,718</b>	<b>100.00%</b>

Table 1 shows the provinces' total land area is 550,718 hectares. The biggest portion or 50.25% are being utilized as agricultural land with an area of 276, 741.50 hectares, more or less. The remaining 49.75% or 273,976.50, more or less, are distributed to forest land, grazing and pasture, freshwater swamp and fishpond, residential, commercial and institutional land and open space/area.

### 1.2 Agricultural Statistical Profile

Graph 1. Agricultural Land Use of Nueva Ecija  
(Source: Provincial Agriculturist, 2018)



The graph shows that the total Agricultural land area of the province is 276,741.50 hectares. Paddy areas dominate the agricultural land use with a total irrigated land area of 162,311.55 and non-irrigated 37,622.90 hectares respectively. The remaining areas are devoted to vegetables (17,621 hectares), fruits orchard (11,000 hectares), other plantation crops (36,346 hectares), other grain crops and root crops (10,946 hectares). While the remaining, 894.05 are upland rainfed, wetland and unclassified areas [11].

### 1.3 Crops Grown by Cities and Municipalities

Its agricultural production covers an area of about 298,742 hectares of fertile lands that are nourished by the Great Pampanga Rivers and its many auxiliaries [12]. Most of the crops grown by city or municipalities are Palay (rice/cereal grain). Each and every city and municipalities are planting and producing palay. Other crops grown are Ampalaya (Bitter gourd), Talong (Eggplant), Kamatis (Tomato).

Table 2. Nueva Ecija Agriculture Profile  
(Source: Philippine Statistics Authority, 2019)

AGRICULTURE	2017	2018
Top five agricultural crops		
Palay		
Area (harvested/hectares)	260,633	309,006
Production (metric tons)	1,435,624	1,664,736
Corn		
Area (harvested/hectares)	77.25	8,018.94
Production (metric tons)	498.78	49,090.84
Onion		
Area (planted/hectares)	11,003.6	9,206.08
Production (metric tons)	137,681	77,550
Garlic		
Area (planted/hectares)	58.89	274.106

Production (metric tons)	224.3	619.1437
Squash		
Area (planted/hectares)	1,272.01	1,021.06
Production (metric tons)	8,842.05	6,750.03

The table above shows the main agricultural products, majority of which are rice, onion, and squash. Aside from the top (5) crops grown in the province are amplaya (bitter gourd), talong (eggplant), and kamatis (tomato) [1].

### Domestic Consumption

#### Rice and Corn

The provinces' annual per capita consumption of rice averaged 49.93 kilograms. By cities or municipalities, average yearly per capita consumption of rice ranged from 38.12 kilograms to 40.68 kilograms.

Corn consumption in the province was estimated at 0.26 kilogram per person a year. The biggest corn consumption was noted in Quezon at 0.46 kilograms.

By barangay classification, households residing in urban barangays had bigger per capita consumption of corn at 0.21 kilogram per year.

#### Vegetables, Legumes and Condiments

Across the province, the biggest yearly per capita consumption levels were noted in onion at 2.65 kilograms, eggplant at 2.32 kilograms, tomato at 1.24 kilograms, and ampalaya at 0.98 kilograms.

#### Fruits

The major fruits eaten in the region were banana at 4.04 kilograms and mango at 2.71 kilograms. Consumption of banana was 0.70 kilograms per person per year. The least consumed fruits were papaya at 0.43 kilograms and calamansi at 0.36 kilograms.

Table 3. Livestock Inventory  
(Philippines Statistics Authority, 2019)

Top five livestock	2016	2017
Carabao	56,820	35,320
Cattle	30,666	30,323
Chicken	8,825,309	2,173,141
Duck	467,033	7,265
Goat	72,450	67,791

The table 3 shows the top 5 livestock inventory in Nueva Ecija. In 2016, the carabao has a total inventory of 56,820 and it decreased by 21,500 in 2017. In 2016, the cattle have

a total inventory of 30,666 and it decreased by 343 in 2017. In 2016, the chicken has a total inventory of 8,825,309 and it decreased by 6,652,168 in 2017. In 2016, the duck has a total inventory of 467,033 and it decreased by 459,768 in 2017. In 2016, the goat has a total inventory of 72,450 and it decreased by 9,659 in 2017 [1].

In the urban barangays of Nueva Ecija, high consumption estimates were noted for pork at 16.46 kilograms and chicken meat at 15.64 kilograms. Per capita consumption of chicken egg across the province averaged 64 pieces per annum. Minimal consumption of duck egg was noted at an average of 2 pieces. Less than a liter of fresh/pasteurized milk was consumed per person annually.

#### 1.4 Support Agencies in Maintaining the Continuous Development of Farming and Other Forms of Agriculture.

Table 4. Support Given by the Government

	No of Respondents	Percentage
Programs/Seminars	5	50%
Financial Program	1	10%
Agricultural Promotion	4	40%
TOTAL	10	100%

Table 4 shows that 50% of the respondents said that the government support the agricultural farming through programs/seminar while 1 respondent which was equivalent to 10% that government support through financial program and 40% of the respondents said that the government support through agricultural promotion.

Table 5. Agency that Gives Support to the Farmers

	No of Respondents	Percentage
Business Agency	4	40%
Commercial Agency	0	0
Bank Agency	6	60%
TOTAL	10	100%

Table 5 shows that 6 respondents which was equivalent to 60% said that bank agency gives support by the agency and 40% of the respondents said that business agency support by the agency. Business agency includes the provincial government through Rice Competitiveness Enhancement Fund (RCEF) while the Development Bank of the Philippines where the provincial capitol has standing credit line and support each provincial government's objective [13].

Other findings revealed that consumer support is lacking and somehow affects farming business, crop rotation is less practiced and use of organic fertilizer is gaining popularity through organic wastes or in combination of it with chemicals to maintain fertile farmlands. Use of pesticide is higher than the use of harvest bug as a method. Surveyed data also revealed that agricultural production is affected by a series of pest infestations, climate change causing livestock count to decrease, the economic trends on supply and demand, coupled with other factors such as temperature, altitude, rainfall, wind, soil type, market, capital and the availability of technology used in farming.

#### 2. Problems in the production and consumption of agricultural crops.

Five villages in this northern Nueva Ecija municipality were placed under a state of calamity after armyworms, which were hatched by a certain kind of butterfly inside and quickly ate up the young leaves of onion, totally damaged nearly 450 hectares of crops [14].

The top five livestock production in 2018 decreased because of climate change. The price of the major commodity in Nueva Ecija is changing weekly. And it also depends on the production of agriculture foods, and the number one cause that affects the production is the weather condition like a typhoon. If there are typhoons the production is low and the price became high, according to the law of supply; if the price increases the supply also increases, and according to the law of demand; if the price decreases the demand increases.

Marketability of goods counts also as a factor. For any commercial farm to succeed there must be demand. If the demand for crop drops, then profits will fall. A more profitable one will then replace that crop. Lastly, capitalization and purchase of modern technology are also problems encountered by farmers.

#### 3. Proposed Continuity Plan to harmonize with the continuous operation and development of sustainable agriculture in the province.

The researchers proposed continuity plans derived from the 72 ways to make Agriculture Sustainable by authors in [15]. The researchers gained some ideas and added other ways for the continuous operation and development of sustainable agriculture in the province of Nueva Ecija. The following can be adopted:

- a. Conserve and create healthy soil

- b. Conserve water appropriately
- c. Manage organic wastes and farm chemicals, so they don't pollute
- d. Manage pest with minimal environmental impact
- e. Select crops and animals adapted to the environment
- f. Protect biodiversity (of domesticated animals, crops, native plants and aquatic life)
- g. Conserve substitute resources
- h. Increase profitability and reduce risk
- i. Conduct seminars, trainings and workshops.

The researchers proposed a continuity plan to maintain sustainable agriculture by way of improving the production of crops and enhancing its variety adapted to climate change and its impacts. Irrigation should be continued and the government must do its fair share in financing the farmers and promoting local or domestic production. Since there has been a decrease on livestock production essential to the symbiotic relationship between the fertility of the soil and the so-called "beasts of burden" used in farmland cultivation, the government must also give its helping hand in propagating farm animals alongside with enriching the soil by organic manure. Also, the best quality of the goods in Nueva Ecija with the help of conserving and creating healthy oil, conserving water appropriately, managing organic wastes and farm chemicals, selecting crops and animals adapted to the environment, managing pest with minimal environmental impact, protecting biodiversity, conserving substitute resources, increasing profitability and reducing risk and also conducting seminars, trainings and workshops. To improve the sustainability of agriculture and the business in producing goods in Nueva Ecija such as crops, livestock, and rice. To support the farmers by providing agricultural equipment and motivating them by giving incentives.

#### IV. CONCLUSION

Agricultural land use: the total Agricultural land area of the province is 276, 741.50 hectares and it must be maintained to have continuous sustainable agriculture. The land is divided into Paddy areas irrigated land area and non-irrigated, vegetable land area, fruits orchard, plantation crops land area, grain crops and root crops land area, upland rainfed, wetland and unclassified areas.

Crops Grown by City or Municipalities: most of the crops grown by city or municipalities are Palay (Rice/cereal grain). Every city and municipalities are planting and producing palay. Other crops grown are Ampalaya (Bitter gourd), Talong (Eggplant), Kamatis (Tomato), which are the primary ingredients of Pinakbet.

Agriculture Statistical Profile: the primary agricultural product in the province is rice, which is practically grown in all towns. The municipality of Guimba accounts for the biggest share of production area for rice and consequently, has the most number of farmers engaged in rice farming. It is followed by the cities of San Jose, Cabanatuan, Munoz, and the municipality of Talavera in that order.

Problems identified in the consumption of the agriculture foods and products that we produced: the consumption of agriculture foods depends on the price, needs and wants of the consumers. The price of the major commodity in Nueva Ecija is changing weekly. And it also depends on the production of agriculture foods, and the number one cause that affects the production is the weather condition like a typhoon.

The proposed continuity plans for the continuous operation and development of sustainable agriculture as regards in maintaining and enhancing of having a sustainable agriculture food industry in Nueva Ecija.

#### V. RECOMMENDATIONS

1. A similar study be conducted so a more accurate picture of the agriculture food sustainability can be used as a reference for having a sustainable agriculture
2. For the concerned government agencies to create incentives for the farmers to adopt best management practices at farm level (environmentally friendly); these would include the use of animal waste (manure storage and management), diversions, grazing land protection. Also, to promote access to good quality food and facilitate training on sustainable feeding practices for livestock.
3. For the concerned government regulatory agency to continue developing and implementing policies and tools to facilitate farmers' access to markets to help improve their livelihoods. Also, continue giving effective information and education program for farmers on local environmental problems and agricultural operations.
4. For the farmers to consider all the environmental, economic and sociological factors that impact the sustainability of their farms.
5. For the consumers to be aware and get information for the prices of the agriculture foods and products they are

buying. And buy only what they need and do not waste agriculture foods.

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