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Awareness & Willingness of Sto. Domingo Farmers to Substitute Corn for Rice Production

Carizza Mae I. Alapriz[1], Joshua Neil A. Adrineda[2], Sarai P. Arceo[3], Ronald Allan Z. Bautista[4], Ariane Angela C. Valez[5], Jennifer G. Fronda[6]

[1]Administrative Officer II, Department of Education
[2]Senior Accounting Officer, Manuel V. Gallego Foundation Colleges Inc.
[3]Wholesale Supervisor, Puregold Price Club, Inc.
[4] Administrative Officer II, Bulacan Agricultural State College
[5]Business Counselor, Department of Trade and Industry
[6]Graduate School Faculty, Nueva Ecija University of Science and Technology

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Abstract— *This descriptive research investigated the potential of corn as an alternative to rice production in Sto. Domingo, Nueva Ecija. A total of three hundred fifty-three (353) registered farmers from three (23) barangays was surveyed using stratified random sampling. The study found that the majority of respondents, owning 1-3 hectares of farmland, indicated a basic awareness of the corn farming process. They believed that corn was easier to grow than rice, offered higher yields, lower production costs, and required less water. Respondents also recognized some health benefits associated with corn, such as its richness in fiber, low cholesterol content, suitability for diabetics, bone health, and digestive benefits. However, during the production stage, respondents found corn farming to be more challenging in terms of pesticide and water management compared to rice. Despite these insights, a significant portion of the respondents expressed reluctance to shift to corn production. This suggests that while there is awareness of the advantages of corn farming, various factors may hinder the transition from rice cultivation. Further research and interventions may be needed to address these barriers and promote corn farming as a viable alternative.*

Keywords **– *Awareness, corn, farmers, rice production, Sto. Domingo, Nueva Ecija***

I. INTRODUCTION

Rice is life, especially for Filipinos and other Asians, rice remains the primary choice for staple food in the Philippines. It is a grain crop that has historical and cultural significance. Aside from the diet and culture, rice also plays a huge part in providing income sources for Filipino families, especially the farmers who work day and night just to provide food not only for their own but for all Filipinos who are dependent on rice to sustain the day-to-day nutrient needs (National Nutrition Council, 2020).

Despite being an agricultural country with plenty of resources, unfortunately, the Philippines is now experiencing a high-priced rice problem. While Filipino farmers do produce large quantities of rice every year, due to the rising consumer demand for rice, the country cannot sustain the demand. The Philippines addressed this issue by importing rice from other countries to keep the prices stable and have enough stocks available for local consumption. However, relying on imports can hamper the country's food security and economic growth. This is why the Philippine government has tasked agricultural specialists to find ways to alleviate the rice shortage, several measures are undertaken to solve the alarming crisis.

Inarguably, rice produced by the country cannot keep up with the actual demand and consumption of every Filipino, this gave the researchers an idea to seek for an alternative to the constant rice problem, like the corn. Corn is one of the most important staple crops in the Philippines; it is the second most plentiful cereal grown for human consumption. Corn is a versatile crop, and everything on a

corn plant is usable. No part of the corn is wasted. The husk of the corn is traditionally used in making tamales. The kernels are ground into food. The stalks become animal food and the corn silks are used for medicinal teas (Sailer, 2012).

Corn, like rice, is an important food staple. According to the Department of Agriculture, only 20% of Filipinos in Visayas and Mindanao eat white corn as their main staple. If people cannot afford to buy rice, particularly white rice, combining white rice and corn grits could be a healthy and affordable alternative. According to a study conducted by the Institute of Human Ecology at the University of the Philippines in Los Baños (UPLB), rice blend (or rice composite), which is a mixture of white rice and corn has an acceptable taste similar to white rice alone (National Nutrition Council, 2022).

According to the study entitled Issues Paper on Corn Industry in the Philippines stated that "Among the world's three major staple crops: corn, rice, and wheat, corn (yellow and white) contributes the most in terms of human calorie intake viz 19.5, 16.5, and 15 percent, respectively. This is not surprising because productivity-wise, corn (or maize) is the most physiologically efficient having a photosynthetic mechanism different from rice and wheat (C4 vs C3). Furthermore, while rice is preferred in areas with sufficient water to saturate/irrigate the field and wheat is grown only in cold areas, corn is rainfed. It can be grown in both tropical and temperate environments" (Salazar et al, 2021).

Another study entitled A Summary of the Use of Maize in Nutritional Products for Sportspeople started "The recent decades have seen a growing interest in the impact of plant constituents on sporting health and performance. Maize or corn (Zea mays L.) ranks third after wheat and rice as a staple food for a large proportion of the population worldwide, particularly in Asian and African countries (Sandhu, Singh, Malhi, 2007; Chaudhary, Kumar, Yadav, 2014). Numerous authors (Nuss, Tanumihardjo, 2010; Wildman, Kerksick, Campbell, 2010; Shah, Prasad, Kumar, 2016) have argued that the corn kernel is an edible and nutritive part of the plant, reporting that it contains carbohydrates, proteins, fats, as well as minerals (i.e. phosphorus, sodium, sulphur, calcium, iron, potassium, magnesium, selenium, and copper) and vitamins (C, E, K, B1, B2, B3, B5, B6, B12). Moreover, it is an essential source of various phytochemicals, such as carotenoids, phenolic compounds, and phytosterols, providing human health benefits and reducing the risk of major chronic disease" (Gierałt, 2020).

Another study entitled Corn Phytochemicals and their Health Benefits concluded that "Although the consumption of corn can be traced back to the fifteenth century, corn has drawn increasing attention globally due to it being rich in nutrients, bioactive compounds, and phytochemicals along with potential health-promoting benefits found in the most recent decades. Most phytochemicals in corn are present in bran and germ fractions instead of the endosperm fraction. Human clinical trials, epidemiological studies, and some animal studies have implicated that regular consumption of corn and its derived whole grain products is associated with a reduced risk of developing chronic diseases such as cardiovascular disease, type 2 diabetes, and obesity. The high amylose content in corn contributes to the digestive health by its nature of resistance to digestion thus bringing bioactive compounds to the colon. Therefore, dietary modifications of increasing corn and other whole grain consumption are practical strategies to optimize health and reduce the risk of chronic diseases" (Sheng, 2018).

Another study entitled Corn Commodity Value Chain Analysis and Strategy in Increasing Farmers' Income in Gorontalo Province, Indonesia stated that "The value chain analysis provides strategic issues in improving corn commodity consisting of three categories, they are: firstly; before planting, include: a. aspects of financial for the procurement of seed and fertilizer, b. land clearing disregarding the environmental aspects. Secondly; cultivation, includes a. farmer's knowledge of good farming practices, b. land conditions (slope), and the last is after planting, including a. cash management, b. limitations of post-harvest facilities, c. farmers' weak bargaining position on the selling price, and d. infrastructure and transportation of crops that still need to be developed (Ilato & Bahua, 2014).

In line with this, the researchers decided to conduct this study to determine the potential of corn as a substitute for rice. This research sought the economic importance and health benefits of having corn as an alternative to rice production.

The objective of the study is to describe the potential of corn value chain analysis as a substitute for rice production in Sto. Domingo, Nueva Ecija. Specifically, this study answered the following:

1. What is the level of awareness of the respondents about:

   2.1 Corn farming;

   2.2 Health benefits; and

   2.3 Other uses?

2. What are the challenges/difficulties that the respondents perceived in shifting from rice production to corn production?
3. How willing are the farmers to shift from rice production to corn production?

II. METHODOLOGY

This research follows a descriptive research design to determine (Subia, Mangiduyos & Turgano, 2020) the potential of corn value chain analysis as a substitute for rice production in Sto. Domingo, Nueva Ecija. The respondents of this study are the registered farmers in Sto. Domingo, Nueva Ecija. The municipality of Sto. Domingo consists of twenty–three (23) barangays with three thousand sixty–one (3,061) registered rice farmers as per data gathered from the Department of Agriculture, Municipality of Sto. Domingo, Nueva Ecija. The researchers utilized stratified random sampling in selecting the respondents. This technique was employed to ensure a fairly equal representation of the variables for the study. The sample size was computed using Slovin's formula with a 5% margin of error. A total of three hundred fifty-three (353) target respondents were computed to answer the questionnaire. The researchers utilized survey questionnaires as a data gathering method, which the respondents answered and submitted online. This was administered through Google Forms, Facebook Messenger and email. The questionnaire covered all information sought under the Statement of the Problem section. The researchers adhered to the research ethics expected, bound by moral principles and legalities. In particular, the researchers worked within the set limits of the Nueva Ecija University of Science and Technology Training Office and the Nueva Ecija University of Science and Technology Graduate School. Moreover, the researchers guarantee the confidentiality of the personal data, answers, and identity of the respondents as protected by the Republic Act No. 10173 (R.A. 10173) or the Data Privacy Act of 2012. Consent from the respondents was deemed provided the moment they willingly participated in data gathering by answering the questionnaire.

III. RESULTS AND DISCUSSION

1. Farming Status

Table 1. Current Farming Status of the Respondents

CHARACTERISTIC	FREQUENCY	PERCENTAGE
Land Area		
Less than 1 hectare	*86*	*24%*
1-3 hectares	*167*	*47%*
4-6 hectares	*91*	*26%*
7-10 hectares	*3*	*1%*
More than 10 hectares	*6*	*2%*
Years in Farming		
Less than1 year	*0*	*0%*
1-3 years	*14*	*4%*
4-6 years	*59*	*17%*
7-10 years	*73*	*21%*
More than 10 years	*207*	*59%*
Farmland Type		
Irrigated	*231*	*65%*
Water Pump	*122*	*35%*
Income from Farming		
Less than 50,000	*63*	*18%*
50,001-100,000	*75*	*21%*
100,001-200,000	*128*	*36%*
More than 200,000	*87*	*25%*

Table 1 shows the current farming status of the respondents from Sto. Domingo Nueva Ecija: the majority of the respondents owned 1-3 hectares of farmland or forty-seven (47) percent, twenty-six (26) percent owned 4-6 hectares of farmland, twenty-four (24) percent owned less than 1 hectare of farmland, and minority-owned 7 hectares and above. While in their farming experience, more than half of the respondents have above 10 years of farming experience; 207 respondents or fifty-nine (59) percent, twenty-one (21) percent have 7-10 years of experience, seventeen (17) percent have 4-6 years of experience, four (4) percent have 1-3 years of experience, and zero (0) percent have less than 1 year of farming experience.

For the farmland type, 231 respondents or sixty-five (65) percent have irrigated type of farmland and only 122 respondents or thirty-five (35) percent sustained by a water pump. In terms of annual income from farming, 128 or thirty-six (36) percent were earning 100,001-200,000 annually, 87 respondents or twenty-five (25) percent were

earning more than 200,000 annually, 75 respondents or twenty-one (21) percent were earning 50,001-100,000 annually, and 63 respondents or eighteen (18) percent were earning less than 50,000 annually.

2. Level of awareness of the respondents about corn farming, health benefits and its other uses

Table 2. Level of Awareness of the Respondents about Corn

LEVEL OF AWARENESS	Weighted Mean	Interpretation
Corn Farming		
Easier to grow	*3.15*	*Aware*
Produce higher yields	*1.9*	*Aware*
Lower production cost	*2.75*	*Aware*
Less water needed	*2.75*	*Aware*
A good alternative for rice	*1.8*	*Somewhat Aware*
Health Benefits		
Safe for diabetic	*1.88*	*Somewhat Aware*
Good for the bone	*2.23*	*Somewhat Aware*
Aids digestion	*1.72*	*Somewhat Aware*
Low in cholesterol	*2.89*	*Aware*
Rich in fiber	*2.6*	*Aware*
Other Uses		
Corn cobs for ethanol	*1.8*	*Somewhat Aware*
Corn cobs for cardboard	*1.43*	*No idea*
Corn silk for teas	*1.43*	*No idea*
Corn husk for tamales	*1.12*	*No idea*

Table 2 shows the level of awareness of the respondents about corn farming, its health benefits and other uses. The majority of the respondents said that they are aware of the process of corn farming, they responded that corn is easier to grow than rice, produce higher yields, has lower production cost, need less water, and somewhat aware that corn is a good alternative for rice.

For the health benefits of corn, respondents stated that they are aware that corn is rich in fiber and low in cholesterol; somewhat aware of being safe for diabetics, good for the bone, and aids digestion. For the other uses of corn and its parts, the majority of the respondents have no idea of the other uses of corn cobs, silks, and husks.

3. Challenges/difficulties that the respondents perceived in shifting from rice production to corn production

Table 3. Perceived Challenges in Shifting from Rice to Corn Production

CATEGORIES	Weighted Mean	Interpretation
Land Preparation	*2.28*	*Easy*
Seed preparation	*2.47*	*Easy*
Planting process	*2.27*	*Easy*
Fertilization process	*2.31*	*Easy*
Pesticides management	*4.13*	*Difficult*
Water management	*3.42*	*Difficult*
Harvesting procedure	*2.87*	*Fair*
Selling	*3.3*	*Fair*

Table 3 shows the possible level of challenges that the respondents may encounter in shifting from rice production to corn production. The illustration shows that in the early stage of production, from land preparation to the fertilization process, respondents stated that it is easier to produce corn than rice. However, the during process of production or the pesticide management and water management, it is more difficult for corn production. In the harvesting procedure and selling stage, respondents answered that they were in a fair state.

4. Willingness of farmers to shift from rice production to corn production

Table 4. The willingness of the Respondents to shift from Rice to Corn Production

CATEGORIES	FREQUENCY	PERCENTAGE
Yes	*74*	*21%*
No	*198*	*56%*
Neutral	*81*	*23%*

Table 4 shows the willingness of the respondents to shift from rice production to corn production. 198 respondents or fifty-six (56) percent stated that they were not willing to shift to corn production, 81 respondents or twenty-three (23) percent were willing to shift to corn production, and 81 respondents or twenty-three (23) percent were on a neutral state and still weighing the options.

IV. CONCLUSIONS AND RECOMMENDATION

The following conclusions were drawn from the above-mentioned results of the study:

1. There is a low level of awareness among the respondents on the area of corn health benefits and corn parts' other uses.
2. Respondents perceived that it is more difficult to maintain healthy corn yields than rice or palay yields.
3. The majority of the respondents are not willing to take risks in shifting to corn production.

Based on the findings and conclusions, the following were recommended:

1. Considering the location of Sto. Domingo, Nueva Ecija, it is recommended for the farmers to try corn production especially those who have elevated farmland and have larger farmland areas.
2. Educate the farmers on the good benefits of corn and encourage not only the farmers but also the society to be innovative and utilise all parts of the corn into worthy products.
3. The government must promote the potential of corn as a rice alternative, to sustain the needs of the Filipinos for staple food especially now that rice prices are increasing and the health problems associated with rice consumption.

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