

NUEVA ECIJA'S PHILIPPINE LIME (*CITROFORTUNELLA MICROCARPA*) AGRIBUSINESS INDUSTRY: MARKETING DISPUTES AND ECONOMIC OUTLOOKS

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ABSTRACT

Philippine lime or calamansi is considered one of the Philippine high-value crops in Nueva Ecija province. This article presents some issues and problems of the calamansi industry in terms of marketing. The study used a descriptive survey of 56 farm-owners or calamansi growers. Findings revealed that lime production could be a stable income source if the growers could provide the necessary production inputs on a sustainable basis. Calamansi farmers in the province are often confronted with the following problems: the high cost of farm inputs, price fluctuations, price manipulation of big-time traders, and other intermediaries. The study also found that the existing actors in the chain were limited to growers, laborers, agri-supply shops, nursery owners, intermediaries, and traders. In terms of trading, there is a high degree of competition among traders in the market. The findings and results from this study may be important factors in developing and designing effective agricultural marketing program and strategic development plan by the authorities in the region.

Contribution/Originality: The study examined the marketing issues and problems associated with lime production in Nueva Ecija, which are major reasons why the industry has yet to take off economically. By addressing these issues objectively, lime growers and other interested parties could adopt and investigate effective marketing strategies that might pave the way for the industry's growth and progress. In effect, the findings may help to boost the country's economy because the region, as an agricultural haven, may introduce another potential agricultural commodity that is equally valuable in local and foreign markets, such as palay and corn.

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1. INTRODUCTION

Nueva Ecija had the largest share of calamansi production in Central Luzon. There were about eighteen (18) municipalities engaged in calamansi farming in 2014. The province's top growers included San Leonardo, Cabanatuan City, Palayan City, Cabiao, and Peñaranda. A total of 756, 136 trees were planted in the province, of which 684, 615 already bear fruit. Approximately 1,481 farmers grow the fruit in the province, and some 1,200 hectares of land are cultivated for calamansi production and farming. Agricultural industry in developing countries is undergoing profound, fast-moving changes. An established processing plant operated by a group of growers through a cooperative is evident only in Palayan City. Cooperatives have brought significant contributions to uplift many

individuals' lives and resolve problems related to marketing, production, and financial (Mina, 2019). De Leon, Vitug, Linsangan, and Diaz (2020) in their paper suggested that a strong financial transaction is an important factor in organizational triumph, and sustainability operation is through the assistance of the Department of Trade and Industry and the Department of Agriculture (DA). Calamansi growers in Cabanatuan City are in the process of obtaining the approval of DA to start the operation of a processing plant in the area.

Based on the data mentioned above, it is worth knowing the possible gaps and constraints in developing calamansi production in the province, limiting its capacity for growth and expansion and causing it to lag behind the production in other competitive regions. This situation has inspired the researchers, who are also farmers and natives of Nueva Ecija to engage in an agribusiness research such as this one. Today, the citrus is still considered a high-value commercial crop, and the government has taken steps to increase the productivity of the industry in the country (Libunao & Libunao, 2003).

1.1. *Philippine Lime or Calamansi Industry in Nueva Ecija*

Calamansi growing in Palayan City has received a big boost in popularity and economic recognition. Several calamansi farms have recently produced citrus juice in commercial quantities, which slowly gained patronage from many first-class eateries in the city, elsewhere in the province and even in Metro Manila areas. With this, the Department of Trade and Industry (DTI) provided the Palayan City Calamansi Growers Association (PCCGA) with P2.2 million juice extraction machinery under its Shared Service Facility program.

Since agricultural production has become a source of livelihood in the province of Nueva Ecija, it cannot be denied that the industry also has existing problems and constraints. The socio-economic, demographic, and biological factors contributing to these negative effects constitute the most significant disadvantages faced by agriculture (Topçu, 2008). Calamansi production for the third quarter of 2018 decreased by 2.1%, from 54.70 thousand metric tons (MT) in the same quarter of the year 2017 to 53.56 thousand metric tons (Philippine Statistics Authority, 2018). This specific situation triggered the researcher to have the interest in investigating the agricultural economic potential of the calamansi industry in Nueva Ecija as one of the sustainable provinces in terms of agriculture. The definition of sustainable agriculture can also be understood from a social point of view as being the ability to respond to the global demand for production (Tirivayi, Knowles, & Davis, 2016). Through this study, the researchers provide information that may reveal the actual situation of the calamansi industry in Nueva Ecija, which would aid them in determining its potential. Doing so would significantly help in empowering the calamansi farmers, uphold viable improvements, and enhance their competitiveness.

1.2. *Opportunities for Philippine Lime or Calamansi Industry*

To improve production and the annual export of fresh and processed fruits to a desired country, a "value chain" research of calamansi was conducted. The value chain analysis (VCA) describes the activities that the organization performs and links them to the organization's competitive position. It encompasses the activities within and around an organization and relates them to an analysis of the competitive strength of the organization. The country's export of calamansi ranged from 20-35 MT in 2008, with an average annual export of 29.5 metric tons MT in fresh fruits. A value chain advantage may be found in turning fresh fruits into value-added processed goods (bottled juice, puree). A total of 144 metric tons MT of calamansi juice and concentrate was exported to Hong Kong, United Arab Emirates and Saudi Arabia in 2013. In Italy, in the range of time between 1991 and 2013, since the abatement of phytosanitary barriers (1992) up to today (Chinnici, Pecorino, & Scuderi, 2013) the investments in citrus fruits farming have reduced by approximately 16% from 182 thousand hectares to 152 thousand hectares. Involvements in different marketing channels may allow farmers to maximize profits and reduce overall risks (Kim, Curtis, & Yeager, 2014).

The Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) reported that the country's calamansi exports ranged from 20-35 metric tons in 2008-2013 with an average yearly export of 29.5 MT in fresh fruits. Calamansi was in great demand abroad. In South Korea, for instance, it was among the latest food fads. The Korean market for food and beverage is very competitive. The Korean market tried to differentiate itself by giving new products in the market. Calamansi has reached the stage where it was different from other lemon products. Many Korean tourists who came to the Philippines were already familiar with calamansi.

1.3. *Problems Encountered in the Lime Industry*

In a report released by the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development of the Department of Science and Technology (DOST-PCAARRD), the local supply of citrus in the Philippines was insufficient to meet local demand. This is brought about by the high occurrence of pests and diseases, inadequate management of orchards, and low acceptance of improved management practices, among many other factors. Meanwhile, the shortage was filled with imports from China, which outcompeted, locally produced fruits, both in cost and quality (DOST-PCAARRD, 2017). There were gaps and constraints in the calamansi industry that limited its potential to increase income and generate much needed employment for the calamansi growing communities. The Philippine Calamansi Association, Inc. (PCAI) recently said that research and development (R&D) programs should address the declining production of calamansi in the country. PCAI stakeholders emphasized that R&D initiatives should also focus on the lack of supply of quality seedlings and the declining fresh calamansi production due to aging trees, shifting to production of other high-value crops, and the conversion of calamansi farms into residential use. Other constraints included: high incidence of pests and diseases, the declining volume of production, huge post-harvest losses, limited access to market, inconsistent quality of processed calamansi products,

low prices during peak season and lack of resources, skills, knowledge, and experience in collective marketing among calamansi farmers.

However, in past decades, an oversupply of fresh calamansi produce in the market during peak production periods caused fruit prices to plummet and produce left to rot on many farms. Farmers have been discouraged from maintaining their calamansi trees and shifted to producing other fruits. Areas devoted to calamansi production gradually declined, and the likely threat of continuous decline is foreseen in succeeding years. The farmers' most pressing problem was the seasonal supply of the calamansi fruits that caused a market glut during the peak season, which resulted in its low price. During this period, the price ranged from P5.00 – P8.00 per kilogram. Thus, farmers opted not to harvest their fruits because labor costs and transportation were unlikely be recovered. Given this situation, there was a need to explore different marketing possibilities for calamansi, both in fresh and processed forms. In a highly volatile and competitive environment, successful business entities do not just add value but reinvent themselves through interactive strategies, specifically by reconfiguring roles, relationships, and structures (Normann & Ramirez, 2000).

2. MATERIALS AND METHODS

This analysis used a descriptive type of research. A descriptive type of research is used to obtain information concerning the current status of conditions in a situation. The study described the calamansi industry using value chain analysis focusing on input provision, production, post-production, marketing, and cost and return analysis. Problems and constraints in the industry were also included. The analysis results formed the basis in proposing a strategic action plan for the calamansi industry in Nueva Ecija. The researcher sent a questionnaire to a sample quota of at least ten (10) respondent-growers in each municipality. The researcher distributed the survey questionnaire in the different barangays of the top five calamansi producing cities and municipalities to reduce bias and subjectivity.

Table 1. Distribution of respondents by cities and municipalities.

Respondents	Sample
1. Calamansi Growers	
San Leonardo	10
Cabanatuan City	10
Palayan City	10
Cabiao	10
Peñaranda	10
2. City/Municipal/Provincial Agriculturists	6
Total	56

The study involved the calamansi growers as the main respondents, and the provincial, city and municipal agriculturists from Local Government Units (LGUs) concerned in Nueva Ecija as secondary sources of data. The distribution of respondents is presented in Table 1. Fifty (50) respondent-growers and six (6) informants served as respondents. The respondents of the study were also identified based on the characteristics given by the data from the Provincial Agriculturist Office.

2.1. Research Instruments

The researcher used a survey questionnaire to collect the necessary data. The instrument was a structured questionnaire supported by an unstructured interview to elicit additional information and check the respondents' consistency of responses to the data gathering instrument.

3. RESULTS AND DISCUSSION

Marketing: Marketing is the last phase in the value chain, including selling strategies and modes of payments practiced by buyers. Selling at farm gate price/kilo: Growers sell their fruits right after the harvest, especially if the farmgate price is attractive and good enough to recover their expenses in the entire production process. Marketing channel selection is one of the most important decisions a farmer can make and has a significant effect on the profitability of farm businesses (Pei-An, Hung-Hao, Junlin, & Kannika, 2017).

The farmgate price per kilo of calamansi fruit in the last two years showed that during peak months (June to October 2018-2019), the fruit prices were at their lowest averages of P15.2/kilo to P8.40/kilo. According to the informant in the Provincial Agriculturist Office of the province, seventy percent (70%) of the calamansi fruits of Nueva Ecija were produced during peak season (June to October) when prices were very low. This can be attributed to the natural characteristic of the calamansi tree that still bore fruits during rainy season even with less farm inputs. Over the last decade, citrus fruit farming, at the international level, has shown an upward trend that has changed the conventional supply scenarios, with the trade of goods from all parts of the world, thanks to the progressive abolition of tariff barriers, (Scuderi & Sturiale, 2016).

As claimed by the respondents during the lean season (November to May), prices began to rise slowly and typically hit the highest levels during March, April and May. However, this was not always the case. Like any industry in the event of calamities, pest and disease infestation, and unpredictable climatic conditions that affected the production of calamansi, prices also rose between June and October due to lower production volume. Apart from the supply factor, prices were often influenced by demand indicators. In the case of Nueva Ecija, if the time came for the

production of calamansi to flourish and be able to convert the fruit into other valuable products such as juice, jam, oil, soap and gel, the demand for the product automatically increased, thus achieving price stability. This is called the value-added principle on products. The term "value-added" describes the enhancement an enterprise gives its product or service before offering it to customers. It can be considered an extra special feature added by the enterprise or producer to increase a product's value. By doing so, an oversupply of agricultural production in farms would be converted into other desirable goods at higher prices until the equilibrium of demand and supply for agricultural output is reached again, thus stabilizing prices. Table 2 presents the year-round farmgate price per 30kg bag of calamansi based on respondents' data for the last two years.

Table 2. Average farmgate price per Kilo of Calamansi from 2017–2019.

City/Municipality	Year	12-Month Period												
		Peak Season					Lean Season							
		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	
Prices (2017 – 2019) in Php	San Leonardo	2019	P16	P16	P8	P8	P15	P15	P20	P33	P30	P33	P60	P23
		2018	15	15	10	8	26	26	30	30	30	35	65	20
		2017	15	16	10	8	25	25	28	30	30	30	60	20
	Cabanatuan	2019	16	16	8	8	15	15	18	35	35	30	65	23
		2018	15	15	10	8	30	30	30	35	35	35	60	20
		2017	15	15	10	8	25	25	30	30	35	35	60	20
	Palayan	2019	16	16	8	8	15	15	20	35	35	30	65	23
		2018	15	15	10	10	25	25	30	30	30	35	65	20
		2017	15	15	10	10	25	25	30	30	30	35	65	20
	Cabiao	2019	16	16	10	8	15	15	15	30	30	35	65	25
		2018	16	16	10	8	30	30	30	30	35	35	65	25
		2017	15	15	10	8	30	30	30	30	30	35	65	25
	Peñaranda	2019	16	16	8	8	15	15	15	33	30	33	60	23
		2018	15	15	10	8	26	26	30	30	30	35	65	20
		2017	15	15	10	8	25	25	30	30	30	35	60	23
	Average	2019	16.0	16.0	8.4	8.0	15.0	15.0	16.6	33.2	32.0	32.2	63.0	23.4
		2018	15.2	15.2	10.0	8.4	27.4	27.4	30.0	31.0	32.0	35.0	64.0	21.0
		2017	15.0	15.2	10.0	8.4	26.0	26.0	29.6	30.0	31.0	34.0	62.0	21.6

Sources: Data is from the responses of the calamansi growers in the top 5 producing cities/municipalities of Nueva Ecija.

As can be seen from Table 2, in the last months of 2019 (November–December), growers expected that prices would continue to rise during the Christmas season, when demand for fruit was high, just as it did in the previous year. There was an average price increase of P 5.00, but was still lower than what was anticipated. In 2018, from P 10.00 average price, it increased to P 26.00.00 and P 30.00 in November and December. Based on interviews conducted, growers said that in their last five years of farming, the price of calamansi usually increased during the same season, but 2019 was an exception. A possible explanation for this was the increase in production relative to the previous quarter. According to the Philippine Statistics Office, calamansi production reached 66.76 thousand metric tons in the last quarter of 2019. It was 24.6% higher than the same quarter level of 53.56 thousand metric tons in 2018. This added to the fact that despite no calamity was recorded, production still decreased.

Table 2 also points out slight price differences in the five (5) localities. Cabanatuan and Palayan City had the same prices during most of the year, while Cabiao, San Leonardo, and Peñaranda were observed to have slight differences in terms of price. The three (3) municipalities did not just cater to markets in Cabanatuan and Sta. Rosa, but also, they sold their commodities in San Fernando, Pampanga. The growing industry of calamansi in Tarlac also affected the market supply in the past two years. Hence, it is expected to be one of the province's leading competitors in quality and production in the coming years. Conceivably, this brought changes in demand and price. With this, it can be concluded that the primary factor in the price changes is still the demand and supply factor, and calamansi production is no exception.

Price manipulations, especially by intermediaries, could trigger a disequilibrium in the value chain. With the interviews conducted, the "sakadora system" also played a big role in the price of the fruit. As a selling practice, growers in the said localities had already established distribution channels for the disposal of their commodity. The "suki", more popularly known as "kasadora" sold the fruit to agents and traders in Divisoria, Pasig and San Fernando. With the researcher's interview of some "kasadoras" in Sangitan Market, according to them, they usually added P 40.00- P 60.00 for trading one (1) 30 kg bag of calamansi. They added as much as P 100.00 per bag during the lean season, but their commission just ranged from P 10.00-P 20.00 per bag for peak season when the price was low. They manipulated the prices, especially during peak season when production was higher, and the demand was lower.

One disadvantage in calamansi farming is that the growers do not have an option to wait for the price to increase since the fruit is subject to decay, unlike palay and onion. The only way to preserve the fruit is to process or convert it to other valuable products such as juice, soap and oil. The fruit yields a higher value in times of lower agricultural/raw prices through the manufacturing concept. In Cabiao, some growers opted to go into the "rolling system" and sold their fruits in a retail price higher than the farm gate price to augment their income.

3.1. Distribution Channel

An effective and sufficient marketing system is a prerequisite for agricultural diversification, for better prices for farmers and for the availability of competitively priced goods to consumers. Due to the increased demand of consumers for local foods and growing concerns about food safety and health, direct marketing of agricultural products has become increasingly popular (Timmons & Wang, 2010). However, the volume of products sold through direct marketing is usually low, and farmers have to face the risk of unsold products (Morgan & Alipoe, 2001). Farmers and traders perform several marketing practices in moving the products from one point to another. The major practices and functions in the calamansi industry include the manner of procurement and distribution, mode of payment and geographic flow of the commodity.

Table 3. Calamansi buyers, mode of payment and mode of distribution.

Description	Items	San Leonardo		Cabanatuan		Palayan		Cabiao		Peñaranda		Total	
		f	%	f	%	f	%	f	%	f	%	f	%
Buyers	Traders	9	90.00	8	80.00	6	60.00	8	80.00	8	80.00	39	78.00
	Cooperative-Processor	0	0.00	0	0.00	2	0.00	0	0.00	0	0.00	0	2.00
	Retail Market	1	10.00	2	20.00	2	30.00	2	20.00	2	20.00	10	20.00
	Total	10	100.00	10	100.00	10	100.00	10	100.00	10	100.00	50	100.00
Mode of Payment	Cash	8	80.00	9	90.00	7	70.00	8	80.00	8	80.00	40	80.00
	Consignment	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	Both	2	20.00	1	10.00	3	30.00	2	20.00	2	20.00	10	20.00
	Total	10	100.00	10	100.00	10	100.00	10	100.00	10	100.00	50	100.00
Mode of Distribution to Buyers	Delivered	0	0.00	2	20.00	0	0.00	2	20.00	0	0.00	4	8.00
	Picked-up	0	0.00	0	0.00	0	0.00	1	10.00	0	0.00	1	2.00
	Both	10	100.00	8	80.00	10	100.00	7	70.00	10	100.00	45	90.00
	Total	10	100.00	10	100.00	10	100.00	10	100.00	10	100.00	50	100.00

Table 3 shows the usual buyers of the calamansi produce from the farm. From the farm level, the growers typically delivered their produce to the trading center. In the case of Nueva Ecija, most of the growers revealed that it was Sangitan Market, which serves as the trading center for the goods. It is where the selling agents or the "sakadoras" are found. From the Sangitan Market, the "sakadoras" negotiated with traders from Bulacan and the National Capital Region (NCR) such as those from Divisoria and Pasig. In the case of Cabiao growers, Pampanga traders were also buyers of the fruit. The traders made up 78% of the calamansi buyers in the province.

Aside from traders, retail markets in the producing localities were also buyers of the goods. These were the agricultural sector and vegetable sellers found in the local markets. The agricultural industry, particularly in developing countries, has an important role to play in terms of the capital required for other sectors, by means of skilled labour, the supply of raw materials to industry, exports and their contribution to national income and the provision of employment opportunities (Bayramoglu, Oguz, Karakayaci, & Arisoy, 2018).

In the case of Palayan City, where an existing cooperative is engaged in processing, grower-members sell part of their harvest to the cooperative. The calamansi juice produced by the processing plant is sold primarily to government agencies in the area and small establishments with the Department of Trade and Industry's assistance. The growers were usually paid in cash, although there were times, particularly during peak season, when growers were paid on a consignment basis. They had to wait until the selling agents sold the fruit.

3.2. Problems Encountered in Marketing

Table 4 presents the problems of calamansi growers in marketing their calamansi produce.

Table 4. Problems on marketing encountered by calamansi growers.

Problems in Marketing	San Leonardo		Cabanatuan		Palayan		Cabiao		Peñaranda		Ave.%	Rank
	f	%	f	%	f	%	f	%	f	%		
Low price due to low quality of produce and oversupply	8	80	8	80	7	70	8	80	7	70	76%	5
Poor farm to market roads	5	50	7	70	8	80	4	40	5	50	58%	7
Price manipulation of trading agents (<i>sakadora</i>)	9	90	9	90	9	90	8	80	9	90	88%	1
Price manipulation of big time traders	8	80	9	90	8	80	8	80	8	80	82%	3
Frequent price fluctuation/unstable prices	9	90	9	90	8	80	8	80	8	80	84%	2
Too many competitors during peak season	8	80	7	70	8	80	8	80	8	80	78%	4
Absence of permanent buyer	7	70	7	70	7	70	7	70	7	70	70%	6

Price manipulation by trading agents or "sakadoras" remains a problem they encounter in marketing (88%). Frequent price fluctuation (84%), price manipulation of big-time traders (82%), and numerous competitors during peak season (78%) were the main problems encountered by calamansi growers. Other problems, like low price due to poor quality of produce and oversupply (76%), absence of permanent market buyer (70%), poor farm to market roads (58%), and delayed payment of goods (56%) ranked fifth, sixth, seventh and eight respectively.

The "sakadora scheme" is a long-standing marketing method for the disposal of calamansi from farms. Such "sakadoras" served as selling agents in the trading of goods in the market. Without their intermediation, it is difficult for growers to sell their commodity to reach the market. The scheme might be favorable to them because of the cost of transporting the goods, but was susceptible to price manipulation. Only large farmland owners who operated 10 hectares or more in the province had access to large-scale traders, freeing them from the middleman network.

Another marketing problem cited by the growers was the price manipulation of big-time traders. Even if the commodity had a short consumable period that could not be subjected to hoarding, price manipulations were still an issue. As experienced by growers, Nueva Ecija calamansi fruits could not directly compete with Oriental Mindoro and Davao regions' harvest in terms of fruit size and quality. Thus, their produce prices were still bargained at the lowest price possible.

Price fluctuations was also a the serious marketing problem experienced by growers. The evolution of the social-economic system, the orientation changes of agricultural policy, especially in the European Union, the market globalization, the evident asymmetries of costs within the sector among the different countries at a different level of development and much more, have contributed to eroding the primary role of citrus fruits farming, causing fluctuating income levels with the unevenness both among different species and different areas of cultivation (Carra, Peri, & Scuderi, 2014; Scuderi, & D'Amico, 2015a; Tudisca, Di Trapani, Sgroi, & Testa, 2014). As cited by them, this resulted from basic market aggregates, supply, and demand. Farmgate price of calamansi was mainly affected by the level of production that caused the price fluctuations.

In the calamansi producing municipalities in the province, growers also experienced problems in their community's number of competitors. According to them, this problem was evident during the peak season when most of the growers simultaneously sold their harvests in the market. The absence of a permanent buyer was occasionally evident during peak season because of large production.

Another problem was the farm to market roads for calamansi growers whose farms were located in far-flung barangays as in Popolon and Aulo in Palayan City. Production categories in calamansi farming can be divided into two (2) types. The first is low production, which means a small amount of fruit harvested and typically happens during the lean season from November to May. On the other hand, high production means a large amount of fruit harvested and generally occurs during the peak season from July to October. A calamansi grower is prone to agricultural problems during low or high production for the whole year including the labor cost. The worker turnover rate was high since they were underpaid (Mina, 2019).

4. CONCLUSION

The size of the harvest of calamansi was greatly affected by pest infestation and bad weather conditions. In the last two years, the farmgate price of calamansi showed the same pattern with moderate differences in November and December of 2019 compared to the previous year. Its peak season was from June to October, and the lean season was from November to May. Proper agricultural management and timing was an effective tool to increase the grower's farm income.

The top problems of the calamansi growers were the high cost of fertilizers, insecticides and fungicides, price manipulation by intermediaries (kasadoras) and big time traders, frequent price fluctuations and spoilage and wastage during the peak season. The government may direct concerned government agencies to intensify research and development to improve new varieties, varietal improvement through biotechnology and accreditation of nurseries. The government may provide more support facilities such as ports, farm-to-market roads, and cold chain systems. The agricultural sector's governing agencies may consider the export potential of the calamansi produce in Nueva Ecija to help the growers improve their livelihood.

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