

# COMPARATIVE ASSESSMENT ON RUBBER FARMING IN AGUSAN DEL SUR BEFORE AND DURING THE COVID-19 PANDEMIC

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## ABSTRACT

The business closures, production halting, and disrupted mobility of products during the COVID-19 pandemic have slowed down the economy globally. In the rubber industry, the ANRPC projected a decline in natural rubber production and consumption, citing the “turbulent” impact of the pandemic. This study was conducted to seek facts on the situation of the rubber industry in the province of Agusan del Sur since there was limited information on its status during the pandemic. Using a descriptive method to validate the rejoinder from the respondents of 200 rubber farmers, the results revealed that the majority have small-scale production in less than a hectare. The study showed that there was a decrease in the selling price of the rubber, increased cost of acetic acid and fertilizers causing less application of fertilizers per tree, and a reduction of employed tappers. These factors contributed to the significant drop in rubber farming net income.

**Keywords:** *COVID-19; rubber production; marketing practices; rubber industry*



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## INTRODUCTION

The coronavirus pandemic is having an unprecedented impact on the global rubber industry as business closes, production is scaled back, travel and shipping are disrupted, and events are canceled and postponed. In some aspects, the COVID-19 pandemic has boosted the natural rubber industry as demand for certain health care products, such as medical gloves, continues to rise. Overall, however, that isn't enough to offset the significant drops in demand and consumption from other sectors, particularly the automotive and tire industries, the Association of Natural Rubber Producing Countries (ANRPC) said in its most recent report.

For the third time this year, the ANRPC revised downward its natural rubber production and consumption projections, citing the "turbulent" impact of the COVID-19 pandemic. In their monthly report issued May 6, the association lowered its 2020 production estimate to 13.4 million metric tons, down 2.3% from the previous year. The revised figure is 679,000 tons lower than predicted in the outlook presented just one month ago: 14.1 million tons at 2.2% growth. Global natural rubber production also fell 3.6% year on year to 2.9 million tons during the first quarter of 2020. ANRPC also lowered its projections for world consumption in 2020. It is now estimated consumption will be at 13 million tons, down 5.1% from the previous year. That also is 516,000 tons lower than last month's forecast of 13.5 million tons, at 1.5% negative growth. Based on the preliminary estimates, the world's consumption of NR fell 20% year-on-year during the first quarter, and it is anticipated to register a 15.5% drop during the first half of the year.

Majority of rubber plantations were in Mindanao. In 2016, Zamboanga Peninsula has a record 90,297 hectares of rubber plantations followed by SOCCSKSARGEN with 61,026. Caraga came out 4th with 12,519 hectares (Philippine Rubber Industry Roadmap 2017-2022). These are the top four rubber plantations in the Philippines. The rubber price variability in Mindanao directly affects the pricing in other areas in the country (Castillo et al., 2014).

In Agusan del Sur, the impact of the COVID-19 pandemic on the rubber farmers and tappers is not yet determined, hence the study was conducted. This study sought to determine the following; the socio-economic and demographic profile of the respondents, the production and marketing of the rubber industry, the problems encountered by the rubber farmers, and the effect of the COVID-19 pandemic on the rubber industry in Agusan del Sur.

## METHODOLOGY

### Research Design

The descriptive survey method was used in the study. Pertinent data were gathered through survey questionnaires, distributed directly to the rubber farmers and tappers in Agusan del Sur.

### Research Respondents

The respondents of the study were the rubber farmers from the different cooperatives in some municipalities of Agusan del Sur. 200 farmers participated in the study which is distributed as follows; San Francisco – 50, Talacogon – 50, La Paz – 30, Bayugan – 28, Esperanza – 22, and Loreto - 20.

### Data Gathering Procedure

In data collection, the researcher administered a questionnaire formulated in English. During the actual interview, the questionnaire was translated into the local dialect. The respondents' verbal responses were recorded to reinforce the information that is needed from the questionnaire.

### Data Analysis

The data gathered were analyzed using the following appropriate statistical tools: simple frequency and percentage for determining the socio-economic and demographic profile of the respondents, the production and marketing of the rubber industry, and the problems encountered by the rubber farmers; and a t-test to compare the rubber farming income before and during the COVID 19 pandemic.

## RESULTS AND DISCUSSION

### Demographic profile

As shown in Table 1, of the respondents 67% were farmers while the rest had other occupations. In general, there were more female than male respondents, however, most of them were married which enlightens that they work hand in hand with their partners. In educational attainment, 56% were elementary level, a condition that hindered high productivity which can be achieved by improving education (Paramitha et al., 2018).

**Table 1**  
*Demographic Profile of the Respondents*

Parameters	Frequency <i>n = 200</i>	Percentage
<b><i>Occupation</i></b>		
Farmer	134	67.00
Housekeeper	26	13.00
Employee	9	4.50
Rubber Tapper	4	2.00
Retired	4	2.00
Laborer	2	1.00
No response	21	10.50
<b><i>Gender</i></b>		
Female	127	63.50
Male	73	36.50
<b><i>Civil Status</i></b>		
Married	158	79.00
Single	16	8.00
Separated	12	6.00
Widow/Widower	14	7.00
<b><i>Educational Attainment</i></b>		
College Graduate	6	3.00
College Level	9	4.50
High School Level	64	32.00
Elementary Level	112	56.00
Vocational Course	6	3.00
Non-Formal Education	1	0.50
None	2	1.00
<b><i>Religion</i></b>		
Catholic	131	65.50
Protestant	65	32.50
Islam	4	2.00

**Socio-economic Profile**

Table 2 shows that 86% depend primarily on rubber farming in terms of income, in addition, 29% depend on salary as their secondary source. Most respondents had a simple living, 73% of them owned a television. The housing of 44.5% was made of wood and nipa, however, 95.5% had electricity. The source of water for 50.5% of respondents was the water system. Furthermore, 77% of them used motorcycles as their transport system.

**Table 2***Socio-economic Profile of the Respondents*

Parameters	Frequency <i>n</i> = 200	Percentage
<b><i>Primary Source of Income</i></b>		
Rubber farming	172	<b>86.00</b>
Farming (Other Crops)	11	5.50
Self/Spouse salary	9	4.50
Business	7	3.50
Children support	1	0.50
<b><i>Secondary Source of Income</i></b>		
Self/Spouse salary	58	<b>29.00</b>
Rubber farming	28	14.00
Business	16	8.00
Farming (Other Crops)	16	8.00
Children support	11	5.50
Cutting trees	2	1.00
None	69	34.50
<b><i>Type of Dwelling</i></b>		
Wood/Nipa	89	<b>44.50</b>
Semi-concrete	79	39.50
Concrete	32	16.00
<b><i>Lighting Facilities</i></b>		
Electricity	191	<b>95.50</b>
Kerosene lamp	6	3.00
Petromax	3	1.50
<b><i>Water System Facilities</i></b>		
Water system	101	<b>50.50</b>
Rain water	76	37.50
Pipe water system	23	11.50
Deep well	1	0.50

\* Multiple responses

**Profile of Rubber Farm in Agusan del Sur**

The profile of rubber farm in Agusan del Sur is presented in Table 3. The result reveals that of the respondents, 63% cultivate one (1) hectare for rubber production. The majority of them, 54% practiced mono-cropping. This data agrees with the result of the study conducted by Mag-aso & Garcia (2019) which stated that rubber farmers in the country, particularly in Mindanao are predominantly composed of smallholder farmers cultivating less than three (3) hectares and rely mainly on their crop's output for income.

The 40.50% planted their rubber trees at a 4m x 6 m planting distance. In terms of the clones used, 73% of the farmers utilize RRIM 600. Most of the respondents, 56%, get their planting materials from their nursery and 59% use budded seedlings.

**Table 3**  
*Profile of Rubber Farm in Agusan del Sur*

Parameters	Frequency <i>n = 200</i>	Percentage
<b><i>Farm Area (Hectares)</i></b>		
0.1 – 1.0	127	<b>63.50</b>
1.1 – 2.0	44	22.00
2.1 – 3.0	7	3.50
3.1 – 4.0	8	4.00
4.1 – 8.0	2	1.00
<b><i>Cropping System</i></b>		
Mono-cropping	108	<b>54.00</b>
Inter-cropping	92	46.00
<b><i>Distance of Planting</i></b>		
4 x 6 m	81	<b>40.50</b>
3 x 5 m	35	17.50
4 x 5 m	20	10.00
5 x 5 m	13	6.50
5 x 6 m	1	0.50
3 x 6 m	1	0.50
<b><i>Rubber Clone Planted</i></b>		
RRIM 600	146	<b>73.00</b>
PB 260	34	17.00
USM	7	3.50
USAD	1	0.50
No response	12	6.00
<b><i>Source of Planting Materials</i></b>		
Own nursery	112	<b>56.00</b>
Department of Agriculture	59	29.50
Private nursery	15	7.50
No response	14	7.00
<b><i>Planting Materials Used</i></b>		
Budded seedlings	118	<b>59.00</b>
Seeds	54	27.00
No response	28	14.00

## Production Practices of Rubber Farmers in Agusan del Sur

The production practices of rubber farmers of Agusan del Sur is presented in Table 4. In terms of fertilizer application, 57% of the farmers apply fertilizer through foliar spraying. 51% of the respondents applied inorganic fertilizer and as to the frequency of application, 24.50% fertilize their trees quarterly, however, the same number of farmers does not apply fertilizer at all.

For plant management such as pruning practices, 71% of the respondents pruned their trees. As to crop protection aspects, 42% of the farmers' practice line weeding to control weeds. Weed control is done by 54.50% every 4 months. The method of weed control is practiced by 38.50% of the farmers through spraying and insect is controlled by 42.50% through cutting and burning of the infested parts where eggs of the attacking insects may hide and hatch.

The table also shows the tapping system used by the respondents, where 33% practice s2/d2 (every two days). 79% of the farmers employ tappers who are experienced to lessen tapping injuries. Controlling the depth of the cut while tapping, is a fundamental feature to avoid injury to the woody tissue, prolonging the productive life of the trees (Di Deus, 2019). The majority also of the respondents, 77.50%, do not apply any chemicals to stimulate latex production.

**Table 4**

*Production Practices of Rubber Farmers in Agusan del Sur*

Parameters	Frequency <i>n</i> = 200	Percentage
<b><i>Methods of Fertilizer Application</i></b>		
Foliar	54	27.00
Basal	50	25.00
Side Dress	16	8.00
Mixed method	31	15.50
No Application	49	24.50
<b><i>Frequency of Fertilizer Application</i></b>		
Quarterly	49	24.50
Semi-Annual	34	17.00
Annual	43	21.50
Occasional	25	12.50
Never	49	24.50
<b><i>Pruning Practices</i></b>		
No	143	71.50
Yes	57	28.50

**Table 4** (continuation)

<b><i>Frequency of weed control</i></b>		
Every 3 months	3	1.50
Every 4 months	109	<b>54.50</b>
Every 6 months	37	18.50
Every Year	39	19.50
Never	12	6.00
<b><i>Tapping System</i></b>		
s2/d2 (every two days)	66	33.00
s2/d1 (every day)	61	30.50
s2/d3 (every three day	34	17.00
s1/d4 (every four days)	13	6.50
No response	26	13.00
<b><i>Tappers Employed</i></b>		
Experienced tappers	159	79.50
Un-experienced tappers	41	20.50
<b><i>Stimulation Practices</i></b>		
Spedtex	25	12.50
Ethrel	20	10.00
None	155	77.50

**Marketing Practices of Rubber Farmers in Agusan del Sur**

The marketing practices of rubber farmers of Agusan del Sur is presented in Table 5. All of the farmers produced rubber cup lumps as the final product, where 58.50% of them sold their products to wholesalers. The majority of target buyers, 95.50% are located within the province. 70.50% of the respondents deliver their product to the buyers. Moreover, 66.50% of the farmers store their products for less than a month before delivery

**Table 5.**  
*Marketing Practices of Rubber Farmers in Agusan del Sur*

Parameters	Frequency <i>n = 200</i>	Percentage
<b><i>Form of rubber products</i></b>		
Cup lumps	200	<b>100.00</b>
<b><i>Undergo Processing of the products</i></b>		
No	200	<b>100.00</b>
<b><i>Market outlet of products</i></b>		
Wholesaler	117	<b>58.50</b>



**Table 5** (*continuation*)

Cooperative	28	14.00
Commission-agent	23	11.50
Wholesale-processor	18	9.00
Assembler-wholesaler	14	7.00
<b><i>Target buyers' location</i></b>		
Within the province	191	<b>95.50</b>
Outside the province	7	3.50
Outside the region	2	1.00
<b><i>Mode of delivery</i></b>		
Delivered	141	<b>70.50</b>
Picked-up	59	29.50
<b><i>Storage duration of the product</i></b>		
Less than one month	133	<b>66.50</b>
More than one month	59	29.50
More than two months	5	2.50
More than three months	3	1.50

### **Problems encountered by the rubber farmers**

Table 3 shows the problem encountered by farmers. In production, 164 (82%) of the farmers encountered the occurrence of insect pests and diseases. The most noticeable diseases were brown root rot, stem bleeding, and white rot. It is one of the serious problems since diseases of the tapping panel may prevent tapping or hinder bark regeneration (Wastie, 2009). In addition, 51 (25.5%) of the farmers declared that rainy days were their problem, rainfall especially during early morning hours delayed the commencement of tapping. This will lead to a delay in the completion of tapping into midday and this will cause shorter latex dripping time (Ismail & Gohet, 2021).

In Marketing, 147 (73.5%) of the farmers specified that low selling prices were their problem. The approximate price range for the Philippines Natural Rubber is P 29.52 per kg only. In addition, 56 (28%) claimed that they have no permanent buyers which could lead to a high cost in searching for new target customers.

**Table 6.**  
*Problems Encountered by the Rubber Farmers in Agusan del Sur*

Parameters	Frequency <i>n = 200</i>	Percentage
<b><i>Problems in production*</i></b>		
Occurrence of insect pests and diseases	164	82.00
Wintering (rainy days)	51	25.50
High cost of inputs	12	6.00
Low production	10	5.00
<b><i>Problems in marketing*</i></b>		
Low selling price	147	73.50
Few buyers/ No permanent buyers	56	28.00
Difficulty in transportation	5	2.50
<b><i>Disease found in the area*</i></b>		
Brown root rot	81	40.50
Stem bleeding	67	33.50
White rot	56	28.00
Knob gall	11	5.50
Stem cutting	1	0.50
<b><i>Insects found in the area</i></b>		
Termites	144	72.00
None	56	28.00

\* Multiple responses

**The Comparative Assessment of Rubber Farming Income in Agusan del Sur Before and During the Covid-19 Pandemic**

The difference in income of rubber farming before and during the Covid-19 pandemic can be viewed from the data shown in Table 7. The notable changes during the pandemic are the significant decrease in the selling price of rubber products with a t-value of 7.021; the increase in buying prices of acetic acid and fertilizer with a t-value of -6.008 and -11.940; the reduction of inputs in terms of tappers employed and fertilizer applied per tree with a t-value of 2.916 and 2.686 respectively; and the reduction in activities in terms of fertilizer application and weed control conducted with a t-value of 4.687 and 5.271 respectively. These scenarios resulted in a significant reduction of rubber farming net income with a t-value of 5.455. The restriction of movement during the peak of the pandemic reduces the options of the farmers to look for buyers who offer a better price and to look for input with a cheaper price. In addition, their farm activities were also affected.

**Table 7.**

*The Comparative Assessment of Rubber Farming Income in Agusan del Sur Before and During the Covid-19 Pandemic*

Parameters	Mean		t	Sig. (2-tailed)
	Before	During		
Monthly Sales volume (kg)	383.91	364.83	0.299	.765
Selling price per kg (Php.)	29.98	26.51	7.021	.000*
Tappers employed	1.74	1.58	2.916	.004*
Buying price of acetic acid/liter	183.72	232.02	-6.008	.000*
Fertilizer application conducted	1.47	1.17	4.687	.000*
Fertilizer applied per tree (kg)	0.37	0.32	2.686	.008*
Fertilizer purchased (bag)	1.13	1.06	1.823	.070
Buying price of fertilizer per bag	1,400.00	1,920.00	-11.940	.000*
Weed control conducted (cycle)	1.69	1.37	5.271	.000*
Rubber farming net income/month	4,540.02	3,534.91	5.455	.000*

\*significant @ .05

## **CONCLUSION**

Most of the rubber farmers in Agusan del Sur were elementary level, they depend primarily on rubber farming as their main source of income, while some of them have a salary as their secondary source. They have television, housing made of wood and nipa, electricity, a water system, and used motorcycles as the transport system.

The majority of the Rubber farmers had a farm area of not more than one hectare, in which they practiced mono-cropping with a planting distance of 4 x 6 meters. They used budded seedlings of RRIM 600 clones that were grown from their nursery. They practiced fertilizer application every quarter using in-organic fertilizers and line weddings every two months but didn't practice pruning. They hired experienced tappers to collect latex every two days. Cup lumps are the final form of their product, which they stored in less than a month and delivered to the wholesalers within the province.

The problems encountered by farmers in production were the occurrence of insect pests and diseases and the rainy days. In marketing, they encountered low selling prices and a lack of permanent buyers. Moreover, the effect of COVID-19 on the rubber industry includes the following; a significant decrease in the selling price of rubber products and at the same time an increase in buying prices of acetic acid and fertilizer and which resulted in a significant reduction in rubber farming net income.

## **RECOMMENDATION**

The result shows the economic problems encountered by the rubber industry during the COVID19 pandemic. In the decrease in the selling price alone, it can be concluded that it will cascade into other economic factors that could lead to the decline of income of the men and women in the industry. It is highly recommended that rubber farmers must strengthen their cooperation with each other to have strong bargaining power towards the suppliers of input like fertilizers and also to the buyer of cup lumps.

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