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Partnership Impact on Production and Income of Indonesia Rubber Farmers

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Abstract

In Indonesia, many rubber farmers carry out partnership-based cooperation. Obviously, this activity gives benefits and impact for both parties. Regarding this idea, this research aimed to determine a partnership pattern found in rubber farmers, partnership impact on the production of rubber farmers in Indonesia, and partnership impact on rubber farmers' income in Indonesia. The study used descriptive and analytical methods. Meanwhile, to determine the problems related to the partnership impact on production and income, the researchers used an independent t-test. However, owing to abnormalities in the test, this study used the Wilcoxon signed-rank test. The result showed that the partnership pattern of rubber farmers in Indonesia was the KOA pattern. In terms of partnership impact on production, there was no significant difference between the production of non-partnered and partnered rubber farmers. Meanwhile, the income measure had a small difference between the two respondent farmers. Following this, rubber farmers should make partnerships due to high profits compared to non-partnership farmers. The bargaining power of farmers is better when they are in a cooperative system, so the price offered is better. This also makes the government's program successful related to the partnership recommendation by farmers.

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INTRODUCTION

The role of the agricultural sector makes Indonesia become the largest agrarian country in the world and holds the strategic position of national economic development. The plantation sector, which is one of several sectors in the agricultural sector, has contributed to the increase in the country's foreign exchange (Rompas et al., 2015)

Based on a research by Wulansari (2021), Indonesia has rubber plantations covering an area of more than 3 million hectares or ranked higher than Indonesia's main competitors, namely Malaysia and Thailand. Rubber in Indonesia, including plantation commodities covers plantation products used by the community for daily needs. Rubber products are one of the export products that make Indonesia become the largest rubber producer in the world. Indonesia is the number two country after Thailand with the title as the largest rubber exporting country in the world. The following is a table of natural rubber production in major producing countries in 2000 – 2020 according to The World Rubber Industry, (2020):

Table 1. Natural Rubber Production of Major Producing Countries 2000 – 2020 (000 Tons)

Country	Year				
	2000	**2005**	**2010**	**2015**	**2020**
Thailand	2.347	2.937	3.192	3.472	3.722
Indonesia	1.501	2.271	2.930	3.486	4.160
Malaysia	928	1.126	1.177	1.071	1.020
India	629	771	897	908	957
China	445	510	619	699	769
Vietnamese	291	469	621	8664	1.067
Etc	594	800	1.355	784	1.321
World	6.734	8.884	10.791	11.274	13.016

Source: The World Rubber Industry, 2020

Based on a research by the International Rubber Study Group (IRSG) in 2020, the world's demand for rubber until 2035 will continue to increase, including the demand for natural rubber. High demand for natural rubber in the global market nowadays has triggered rubber-producing countries to perform the export,causing the market share of Indonesia in the global market decreases (Zuhdi and Anggraini, 2020). The decrease in Indonesia natural rubber products competitiveness level happened because in the global market Indonesia was dominantly influenced by the declined natural rubber export. In other words, the export of Indonesian natural rubber has been a declining trend and influenced by market distribution. Under those circumstances, the importer countries alter their importing activity from other countries due to the low quality of Indonesian natural rubber.

The above phenomenon is influenced by 2 factors, namely a stable world economy that encourages increased consumption and increases human welfare accompanied by the demand for cars and other goods containing rubber components, and the scarcity of petroleum due to the higher the price of synthetic rubber causing the shift use of synthetic rubber to natural rubber. This will increase the demand for natural rubber in the world market. As a country that has the second-largest rubber production area in the world, Indonesia becomes one of the largest natural rubber producers (Wahyono, 2016).

The data used in this study were taken from the results of the 2013 Agricultural Census regarding the 2014 Plantation Business Household Survey. The agricultural census is an activity to record business in all agricultural sectors, starting from the food, livestock, plantation, horticulture, fisheries and forestry sectors. The benefits of the agricultural census are not directly felt by farmers, but the results are used for planning, policy implementation,

program evaluations and others. The data generated cover production costs for the past year, land area, socio-demographic characteristics and others.

Rubber plantations in Indonesia are managed by several types of business actors in groups who carry out agribusiness activities of an agricultural commodity, such as rubber. According to (Wahyono, 2016), rubber business actors are divided into 3, namely people's plantations, private plantations, and state plantations. Plantation is a profitable activity for farmers because it has high job prospects when carried out. Plantations spread across various regions have different average production in each region. There are several factors that cause differences in averages such as inadequate land area, erratic weather factors, inadequate labor and others. A research by Ricardo (2016) shows partnership relationships in rubber plantations can be reviewed with *Proyek Kemitraan Terpadu* (PKT) or integrated partnership project with the involvement of several mutually beneficial partnerships. This project is based on cooperation between large businesses (core) and small businesses (plasma), as well as banking participation aiming to provide small business loans more conveniently, safely, and effectively. Integrated partnership project activities can increase the success of the plantation business to be higher. The relationship between rubber plantations and the involvement of several parties in the partnership will show a pattern of rubber partnerships which takes part as the manager of the business garden with the help of the cooperative's intervention which helps the business as needed.

The challenge in the rubber industry is the increasingly fierce competition with rubber products from competing countries, namely India and China which sell tires at low prices. China affects rubber prices because it dominates world rubber consumption. Here, whatever happens to China's economic growth affect the demand for natural rubber, including the trade war with the United States (US) (Aisyah et al., 2021). By the same token, Indonesia's natural rubber export prices have a positive relationship with domestic consumption and international rubber prices. Meanwhile, the export prices of Indonesia's natural rubber has a negative relationship with the exchange rate of the rupiah against the dollar (Daulika et al., 2020).

Domestic consumers do not love and believe in products made in their own country since SNI (Standar Nasional Indonesia) has not been enforced on rubber goods other than tires causing export countries concern about the quality problems for the rubber produced. The weakness of the rubber industry in terms of transportation facilities and infrastructure can be found in some aspects, such as the absence of special education in the rubber sector and the weak mastery of high technology. According to a research by Kurnia et al. (2020) the development of the manufacturing industry of latex-based downstream product in Indonesia continues to decline, and it is inversely proportional to the development of similar industries in Malaysia and Thailand. This also requires government policies in the form of facilities and infrastructure development, funds provision that will later be used for finance industrial development, and developing a partnership system between farmers and companies. A possible partnership pattern is the "PIR plus" in which farmers continue to own their plantations and rubber trees and at the same time hold shares in the partner companies. This partnership will provide benefits between farmers and partners (Wahyono, 2016).

According to Azmie et al. (2019), types of partnership patterns include: plasma nucleus, subcontracting, franchising, general trading, distribution and agency, profit sharing, operational cooperation, joint ventures, outsourcing, and other forms of partnership. Based on article 4 of the Decree of the Minister of Agriculture of the Republic of Indonesia Number: 940/KPTS/OT.210/10/97 concerning guidelines for agricultural business partnerships, agricultural business partnerships implement the following pattern: first, the plasma core pattern, a partnership relationship that exists between a company and a partner group, the company as the core while the partner group as the plasma.

A subcontracting partnership pattern is a group of partners whose job is to provide whatever components needed by the partner company for the benefit of its production. Second, an agency pattern, a pattern in which large companies provide products and give small companies the right to market these products for a fee. Third, the general trade partnership pattern, a pattern which requires partner companies market the products of partner groups or partner groups supply their products to partner companies (Zakaria, 2015).

A research by Saleh (2015) investigated PT Perkebunan Nusantara XIII which conducts partnerships by means of coaching and social responsibility. Based on the results of the 2013 Agricultural Census regarding the 2014 Plantation Business Household Survey, the total number of farmers who took part in the survey was 46,394. However, the participated ones were 276, whole the remaining 46,118 did not participate in the partnership. The main partnerships carried out by farmers are divided into 3, namely 63 farmers participated in BUMN partnerships, 19 rubber farmers participated in BUMD partnerships, and 194 rubber farmers chose to participate in PRIVATE partnerships. The survey results also state that around 26,134 rubber farmers experienced difficulties in marketing their agricultural products. A total of 625 farmers experienced difficulties during transportation, Khoiriah and Susdianto (2021) argue one of the causes of difficulties facing by farmers in marketing agricultural products and the low price of rubber is the farmers do not process their rubber products by themselves.

A research by Bakar et al., (2012) concludes farmers prefer having modern company partners to traditional institutions because they have difficulty processing their own rubber products. This has some impact that can distinguish the production results and income of rubber farmers who are partnered and not partnered. Production costs, fertilizer costs, average costs, marketing costs, rubber prices, net income and gross income are also different. As for the difference of opinion by Husin et al (2017), the income gap between farmers with and without partnership is significant. The income of partner farmers is more than that of non-partnered farmers. The difference between farmers who do not partner is very clear, namely the number of farmers who do not partner is more than that of partnered farmers. This is what underlies the researchers to determine the effect of partnerships on the production and income of rubber farmers, where the partnership in question is the relationship between rubber farmers and BUMN, BUMD, and Private.

Bakar and Fauzi (2013) state that family income affects the choice between partnership and traditional institutions. In Soetriono and Suwandari (2016), farmers who carry out their own farming activities do not have the power to to maximize their farming due to the inability to technology, management, capital and marketing so that by partnering they can reduce the risk of failure during farming. There are many benefits that farmers get when doing partnerships, such as being able to improve the quality of partner groups, increasing the quality and quantity of production, increasing income, having a drive of success and others. Even, as the time develops partnerships will have greater impact between the two parties. Partnership is expected to be able to provide beneficial effects for partner farmers such as increased income which will have an impact on improving the welfare and standard of living of farmers (Cahyarubin, 2016). Several farmers in Indonesia have become active partners of partnership. However, there are still farmers who have not been interested in participating. This was presumably due to slight differences in production and income received by partner and non-partner farmers. Based on the problems above, the researcher wanted to know the existing partnerships of rubber farmers and the impact of partnerships on the production and income of rubber farmers in Indonesia.

Researches related to partnerships and their impact have previously been done, such as researcher conducted by Fitri et al. (2018), Puspitaningrum et al. (2019), Bakar et al. (2019), and Cahyarubin (2016). This paper

discusses the effect of partnerships on production and marketing of fruit, sugarcane, coffee, and rubber commodities. In addition, previous studies have discussed more about partnerships at the regional (regency and provincial) level. In addition, the novelty of this research contributes to partnerships and their impact on production and income with a national or Indonesian scope.

The purpose of this research was to find out the pattern of partnerships found in rubber farmers in Indonesia, to find out the impact of partnerships on the production of rubber farmers in Indonesia, and to find out the impact of partnerships on the income of rubber farmers in Indonesia. This research was different from previous research because the data in this study were obtained from secondary data from the 2013 Agricultural Census regarding the 2014 Plantation Business Household Survey. The agricultural census is conducted by the Statistics Indonesia (BPS) once in 10 years. The agricultural census has been carried out for 6 times in 1963, 1973, 1983, and 1993 with the latest data in 2013.

RESEARCH METHODS

This research used descriptive and analytical methods. Prabowo and Heriyanto (2013) state that descriptive qualitative approach method is a method of data processing by analyzing factors related to the object of research by presenting the data in more depth to the object of research. This method can be used to describe phenomena systematically, in detail, and accurately in the formulation regarding the partnership pattern of rubber farmers and the problem formulations regarding the impact of partnerships on the production and income of rubber farmers in Indonesia. Habib and Kuntadi (2020) argue analytical method is a problem solving procedure that uses analytical tools. Analytical methods can be used to examine the second and third problems, namely the impact of partnerships on rubber production and income in Indonesia. Problems related to the impact of partnerships on production and income were analyzed using an independent t-test, but since there found some abnormalities in the data being tested, this research used the Wilcoxon signed-rank test.

In terms of data, this research compiled the data from the 2013 Agricultural Census regarding the 2014 Plantation Business Household Survey using respondents who worked in rubber farming. The population in this study was rubber farmers who were partnered and not partnered. Based on the census data, the total number of rubber farmers was 46,934 rubber farmers, with 276 partner farmers and 46,118 non-partnering rubber farmers. The number of samples in this study was determined usinh a disproportionate stratified random sampling (proportional stratified random sample). This technique is carried out when the sample obtained is not homogeneous in a population. Moreover, it is done by taking a sample and then dividing the population into strata, selecting a simple random sample from each stratum, and incorporate into the sample. The goal is to use to estimate population parameters and allow each member of the population to have an equal chance to be sampled (Siti et al., 2018).

According to Gay and Diehl (1992) the sample taken by researchers should be as large as possible. It is assumed that the more samples used, the more representative they will be and the results can be generalized. Sampling is carried out depending on the type of research used by the researcher. In causal comparison research, the sample used was 30 subjects per group. This is also not much different from the researches by Gay and Diehl (1992) and Roscoe (1975) which state thata sample size of more than 30 and less than 500 is appropriate for most studies, and if the sample is broken down into subsamples (male/female, junior /senior, etc.), the minimum sample size used is 30 per category. The population that was stratified or grouped in this study was divided into 2 groups, namely partner farmers and non-partner farmers. As for the selection of samples, a systematic random sampling technique was performed by taking the serial number of

respondents with an even number, which then resulted in a sample of 100 partner farmers and 100 non-partner farmers. Sampling was used in order to represent the characteristics of the existing population.

The method used to answer the first topic, the partnership pattern found in rubber farmers was a qualitative descriptive method. The partnership pattern can be seen from several aspects, namely the provision of land for farmers, namely self-owned, leased and rent-free. The next technical guidance was divided into PPL (Field Agricultural Extension)/related plantation service/the government and others. The kinds guidance obtained by rubber farmers were cultivation techniques, pest control, marketing, post-harvest, and others. The four technologies were divided into 4, namely self-owned, group-owned, leased, and rent-free. Next, the five sources of loans with interest were obtained from banks, rural banks, other financial institutions, cooperatives, plantation companies, and individuals.

The six grants/subsidy/free aids came from the government, BUMN/BUMD, individuals, and others. The production facilities received by farmers were divided into seeds, fertilizers, pesticides, and tools/machines. Seventh, the distribution of plantation products was aimed at self-consumption, KUD, markets, collectors, and plantation companies. Then, the causes of marketing difficulties were divided into 5, namely transportation problems, quality requirements, low prices, far enough marketing distances, and others. Finally, the difficulty of business barriers were divided into 5 difficulties in obtaining loans, the increase in production costs which was higher than the production price, the impact of severe pest attacks, difficulties in getting workers/ higher salary for workers, and the scarcity of production facilities.

RESULTS AND DISCUSSION

Partnership pattern is a form of cooperation in a business where there are two or more people whose goal is mutual benefit to one another. It is made based on an agreement where both parties adhere to mutually agreed principles. The principles held by both parties are mutual need, mutual benefit, and interdependence in order to achieve goals and increase business. The existing partnership patterns in Indonesia are divided into five, namely the nucleus-plasma pattern, subcontracting pattern, general trading pattern, agency pattern and KOA (Agribusiness Operational Cooperation) pattern.

When farmers join partnerships with their partners, it is hoped that they will be able to better manage their farms, increase farmers' businesses, encourage economic development, and ensure the marketing of agricultural products. Partners of rubber farmers in Indonesia are divided into three, namely: BUMN, BUMD, and private parties. The partnership that exists between rubber farmers and partners has gone through a long process and both have an agreement and agreed on the rights and obligations of each party. Rights and obligations occur because both need each other and provide mutual benefits to both rubber farmers and partners. The partnership will last long if both feel mutually beneficial.

The researchers used several indicators to determine the pattern of partnerships carried out by rubber farmers. Some of the indicators used included land provision, technical counseling/guidance obtained, capital loans, free grants or subsidies, production facilities assistance, and market guarantees. Technical guidance that can be obtained by rubber farmers includes cultivation techniques, pest control, marketing, post-harvest, and others. Assistance for production facilities can be in the form of seeds, fertilizers, pesticides, agricultural tools/machines, while distribution of plantation products can be consumed by themselves, KUD, markets, collectors, plantation companies, and can be made into stock by farmers. Each partnership pattern certainly has characteristics and differentiators between the five partnership patterns.

The difference in each pattern can be seen from the characteristics of each pattern, the rights and obligations that must be fulfilled by

both parties, the mechanism or implementation of the partnership, the advantages and disadvantages of each partnership pattern. Based on the results of the 2013 Agricultural Census data regarding the 2014 Plantation Business Household Survey, the data regarding the way partnership pattern was carried out by rubber farmers in Indonesia were obtained and presented in Table 2.

Table 2. The Relationship Pattern of Partnership with Form of Partner Company

No	Partnership Pattern	Plasma Core Pattern	Sub Contract Pattern	General Trading Patterns	Agency Pattern	KOA Pattern
1.	Land Preparation	10%	0%	0%	0%	92%
2.	Counseling	15%	0%	0%	0%	15%
3.	Technical guidance	0%	0%	0%	0%	0%
4.	Technology	8%	8%	8%	0%	8%
5.	Grant Assistance	34%	0%	0%	0%	34%
6.	Production facilities Assistance	0%	0%	0%	0%	34%
7.	Distribution of results	0%	100%	100%	0%	100%

Source: Data Processed, 2022

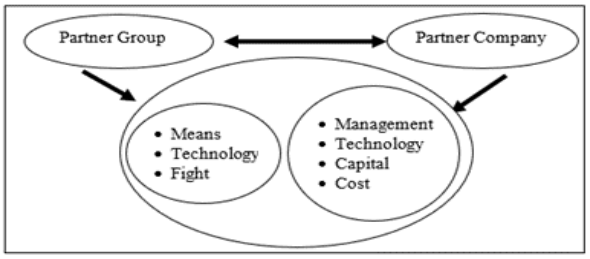

Figure 1. Partnership Pattern of Rubber Farmers in Indonesia

The existing partnership pattern between rubber farmers and partners was the KOA (Agribusiness Operational Cooperation). In this partnership, farmers usually receive inputs (facilities and infrastructure), capital in the form of operational costs, and market guarantees. The KOA pattern is also often applied to plantation business actors. This pattern is also often applied in village communities.

Figure 1 is a picture of the partnership pattern of rubber farmers who have partnered in Indonesia. Here, the partner group provided land, labor and infrastructure. Meanwhile, the partner company gave counseling, capital, costs, assistance for production facilities and guarantees for the distribution of their farming results. In addition, each partnership has its own advantages and disadvantages.

Table 3. Rights and Obligations of Rubber Farmers and Partner Companies

No	Party	Right	Obligation
1.	Partner Farmers	- Get counseling - Get capital and financial assistance - Production facility assistance - Guaranteed distribution of results - Government involvement in cooperation between farmers and entrepreneurs - Joint risk management	- Provide Land - Provide manpower - Provide infrastructure
2.	Partner Company	Get benefits in accordance with the mutually agreed agreement	- Provide counseling - Capital assistance and costs - Production facility assistance - Guaranteed distribution of farm products

Source: Data Processed, 2021

KOA partnership pattern actually has the same advantages as the core-plasma system. KOA pattern is most commonly found in rural communities done by small businesses in the village and household businesses in the form of a profit-sharing system. For example, if the land owner provides land to be used, the farmer provides capital, labor, and other agricultural facilities whose profit sharing is 40: 50. This means 40% of the profit for the land owner and 50% for the farmer. The disadvantages of the KOA pattern are: profit taking by partner companies that handle aspects of marketing and product processing is too large so that small business groups feel it is unfair, partner companies tend to be monopsony, thereby they tend to reduce the profits for their partner small entrepreneurs, and there is no third party has played an effective role in solving the problem.

The results of the normality test for the impact of partnerships on production can be seen in Table 4 below:

Table 4. Normality Test of Partnership Impact Analysis on Production

Farmer	Kolomogrov-Smirnov [a]		
	Statistics	df	Sig.(2 *tails*)
Non-Partnership	0.285	100	0.000
Partnership	0.160	100	0.000

Source: Data Processed, 2021

Table 4 shows the normality test of the partnership impact on production whose significance value was <0.05, meaning that the value was not normally distributed. Based on this value, the researchers used the Wilcoxon signed-rank test to overcome normally distributed data. Further, the results are presented in the following table 5.

Table 5. Normality Test of Partnership Impact Analysis on Income.

Farmer	Kolomogrov-Smirnov [a]		
	Statistics	Df	Sig. (2 *tails*)
Non-Partnership	0.162	100	0.000
Partnership	0.363	100	0.000

Source: Data Processed, 2021

Similarly, the results in table 5 was not normally distributed with the value of <0.05. Again, the Wilcoxon signed-rank test was performed

In carrying out this test, the following formulas were used:

$$\mu W_R = \frac{n(n+1)}{4}$$

$$\sigma W_R = \sqrt{\frac{n(n+1)(2n+1)}{24} - \frac{\sum t^3 - \sum t}{48}}$$

$$Z_w = \frac{W_R - \mu W_R}{\sigma W_R} \quad \text{..... (1)}$$

μW_R is Wilcoxon rank / mean; Sp is positive rank; Sn is negative rating; $\sum t$ is number of rankings from the mean value of the difference in the production measurement of partner rubber farmers with non partnership farmers (negative); and Z_w is table Z to test Z score.The basis for making decisions was the same as the Z test, namely if the probability (Asymp.Sig) < 0.05, H0 is accepted and Ha is rejected; and if the probability (Asymp.Sig) > 0.05, Ha is accepted and H0 is rejected.

The Wilcoxon signed-rank test determined the following hypotheses: H0: there is a difference between the production of partnership rubber farmers and non partnership farmers; and Ha: there is no difference between the production of partnership rubber farmers and non partnership farmers. H0 is rejected if the probability value < 0.05 indicating a significant difference between the production of partnership rubber farmers and non-partnership farmers. The last step was drawing conclusions based on the hypothesis testing.

The next step was revenue testing procedure by using Wilcoxon signed-rank test formulas for the impact of partnerships on revenue in Indonesia as follows:

$$W_R = \frac{n(n+1)}{4}$$

$$\sigma W_R = \sqrt{\frac{n(n+1)(2n+1)}{24} - \frac{\sum t^3 - \sum t}{48}}$$

$$Z_w = \frac{W_R - \mu W_R}{\sigma W_R} \quad \text{..... (2)}$$

μW_R is Wilcoxon r / average; Sp is positive rank; Sn is negative rating; $\sum t$ is number of rankings from the average value of the difference in the income measurement of partnership rubber farmers with non partnership farmers (negative); and Z_w is Table Z to test Z score. The basis for making decisions was the same as the Z test, namely if the probability (Asymp.Sig) < 0.05 then H_0 is accepted and H_a

is rejected; and if the probability (Asymp.Sig) > 0.05, H_a is accepted and H_0 is rejected.

Furthermore, the next step was determining the hypothesis specified in the Wilcoxon signed-rank test as follows: H_0: there is a difference between the income of partnership rubber farmers and non partnership farmers; and Ha: there is no difference between the income of partnership rubber farmers and non partnership farmers. After that, the researchers determined the level of significance of 5% or 0.05. The next step was the defining the test criterion, namely H_0 is rejected if the probability value < 0.05 or there was a significant difference between the income of partnership rubber farmers and non partnership farmers. Finally, conclusion drawing was conducted.

Production is the end result of a process or economic activity that utilizes several inputs. Factors of production are influenced by land, labor, capital, fertilizers, pesticides, seeds and technology used by farmers. Production activities carried out in a company/when running a farming business can be said to be good the company can meet the production target. The problem that often occurs in rubber plants and affects rubber production was the weather during the rainy season. During the rainy season, latex production decreased and farmers could not reach the daily production target. High rainfall made make the latex into a lump and eventually farmers got a lower price. Based on the data that has been obtained, and tested for the level of normality, it was found that the data were not normally distributed, meaning that the analysis that could be used was non-parametric with the Wilcoxon-rank test.

The following are the results of the analysis using the Wilcoxon test on the data that have been obtained and the results of the study can be seen in Table 6:

Table 6. Differences in production between non-partnered and partnered rubber farmers

Farmer	Production Average (Kg/m2/year)	z-table	Sig. (2 tails)
Not Partnering	4.64 Kg/m2	-1.095b	0.273
Partner	5.10 Kg/m2		

Source: Data Processed, 2021

Based on Table 6 the average production per year of partnered farmers was greater than that of non-partnered farmers. Non-partnered farmers had an average production of 4.64 Kg/m2/year, whereas partnered rubber farmers gained an average production of 5.10 Kg/M2/year. Since the results showed probability of (Asymp.Sig), 0.05 < 0.273 then H0 was accepted and Ha was rejected. It can be concluded that there was no significant difference between the production of non-partnered and partnered rubber farmers. The difference in the average production of non-partnered and partnered farmers was not far enough, but the production of partnered farmers was far superior. One of the other factors that can be seen in terms of the use of appropriate inputs was the use of inputs that was combined with the aim of getting better results. This is in line with a research by (Kurniati and Darus, 2019) that the use of inputs in the right amount will have an impact on increasing production, on the contrary, excess or lack of input causes production to be not optimal.

According Kuswanto et al., (2019) possible efforts to increase rubber production are optimizing the use of labor both in the context of tapping, weeding, fertilizing, controlling pests and weeds and other businesses that support the success of rubber products, improving agricultural technology, such as using superior seeds, rejuvenating less productive crops through business partnerships with private companies and the state, and getting significant government support in providing fertilizers and encouraging farmers to increase their use.

This can be seen from the activities of partner companies that gave rights to partner farmers. These rights were in the form of providing land, capital, counseling, technological assistance, grant assistance, and distribution of marketing results.

Table 7. Production of non-partnered and partnered rubber farmers

No	Description	Plant Area(m2)	Production (Kg/m2)	Percentages (%)
1	**Not Partnering**			
	Amount	202.145	464.02	47.65%
	Average	2,021.45	4.64	
2	**Partner**			
	Amount	103,880	509.76	52.35%
	Average	1,038.8	5,10	
	Total	203,183.8	973.79	100%

Source: Data Processed, 2021

Rubber farming carried out by non-partnered and partnered rubber farmers produced different results. The average production received by non-partnered rubber farmers was 4.64 Kg/m2, while partnered rubber was 5.10 Kg/m2. In Table 4.3 it can also be explained that the total production of non-partnered farmers was 464.02 Kg/m2. The farmers who partnered had a total production of 509.76 Kg/m2. It can be concluded that the number of farmers who partnered with farmers achieved higher production than farmers who did not. One of the reasons for this was the area of plantations for rubber farmers. Rubber farmers who did not partner had a higher plant area than the planted area of farmers who were partnered. The planted area of non-partnering farmers was 202.145 m2, while the partnered farmers' area was 103,880 m2, but the resulting product was inversely proportional to the existing plant area. The results of this analysis contradicted to the research conducted by (Ayu et al., 2021) that on increasing farm income, land area is very influential to increase farmers' income. In addition, several other influencing factors such as land area, capital, and production can also affect the income earned by farmers.

Farmers who did not have partners in running their farming might have understood the problems that existed in the field, besides that they also had the same knowledge related to farming or at the upstream level. This can also be caused by several advantages of partnered farmers, including the provision of capital, infrastructure, and some other assistance. However, these do not guarantee a significant increase in production because technically farmers are the main subject. The guarantee of inputs received by farmers and downstream was a stimulus, meaning that if it is not balanced with increased technical implementation from farmers, it will also have an insignificant impact on increasing production. Therefore, this analysis showed that there was no real significance in the production because the difference between the production of farmers who were non-partnership and partnership was small.

In assessing the difference in income received by rubber farmers in running their farming business, wheter significantly different or not significantly, the Wilcoxon test analysis was carried out. This test was used to determine the difference in the average income of rubber farmers, when not in partnership and when doing partnership. Since the data in this research were not normally distributed, non-parametric with the Wilcoxon signed-rank test was conducted.

The following table 8 presents the results of the analysis using the Wilcoxon test on the data that have been obtained.

Table 8. Differences in income between non-partnered and partnered rubber farmers

Farmer	Income average/year	z-table	Sig. (2 tails)
Not Partnering	Rp. 902,000.33	-2,984b	.003
partner	Rp. 10,618,000.60		

Source: Data Processed, 2021

Based on table 8, the average annual income of partnered farmers was greater than that of non-partnered farmers. Farmers who did not partner earned an income of Rp. 902,000.33, while those who partnered had an income of Rp. 10.618.000.60. In addition, the test results showed the probability of (Asymp.Sig), 0.05 > 0.003, then H0 was rejected and Ha was accepted. It can be concluded that there was a significant difference between the income of non-partnered and partnered rubber farmers. Farmers who carried out their farming activities and participated in partnerships earned higher incomes than those who did not. Partner farmers will receive marketing guarantees/distribution results and have different price guarantees from non partnership farmers. This result is consistent with the research of Husin et al., (2017) which shows that partnership rubber farmers earn 68% of their income, much higher than 64% of non partnership farmers. This very significant difference is very beneficial for rubber farmers. Husin et al., (2017), also argue that farmer income is one of the easiest indicators to use to differentiate between two different systems.

Table 9. Revenue of Non-Partnered and Partnered Rubber Farmers

No	Description	Production (Kg/m/000)	Rubber Price (Rp/000)	Production Value (Rp/000)	Percentage (%)
1	Not Partnering	464.02	7	2,276,817	38.81
2	partner	509.76	7.74	3,590.070	61.19
	Total	973.79	14.74	5,866.887	100

Source: Data Processed, 2021

Table 9 statistically shows a significant difference between production, the price received by farmers, and the value of the production obtained. The greater the amount of production obtained by farmers, the greater the income received by farmers. Conversely, the smaller the amount of production, the smaller the income received by farmers. The production value in the survey data was the value of the rubber commodity produced by the production sector. It was the result of multiplying the quantity of production with the price per unit of the commodity. The unit price was stated at the producer price at the time the commodity was produced. In Table 9, it can be seen that the costs incurred by partnered farmers were greater than those of non-partnered farmers. The cost incurred by non-partnered farmers was Rp. 2,186,584,000 while partnered farmers cost was Rp. 2,528,210,000. The difference was not high, approximately Rp. 341,626,000. The high-cost difference can be seen in Table 9 which shows that there was a difference in costs between partnered and non-partnered farmers. The largest cost component incurred by non-partnering farmers was other expenses of Rp. 1,394,514. Other expenditure costs consisted of 1) land costs, both leased and free of rent, 2) business equipment/facilities, both leased and free of rent, 3) business credit/loans, 4) indirect taxes, 5) levies/levies/contributions, 6) depreciation of capital goods, 7) fuel, 8) costs of transportation/transportation of produce, 9) agricultural services and 10) others (containers, and others). Partnered farmers incurred the largest costs in the cost of wages given to existing work.

Table 10. Types of Costs Expended by Non-Partner and Partner Rubber Farmers

No	Fee Type	Not partner	Percentage (%)	partner	Percentage (%)
1	Seeds (Rp/000)	6.275	0.29%	11,499	0.45%
2	Protective Plants (Rp/000)	0	0%	0	0%
3	Fertilizer (Rp/000)	16.515	0.76%	160,845	6.36%
5	Liquid Pesticide (Rp/000)	14,688	0.67%	23,515	0.39%
6	Wages (Rp/000)	754.592	34.51%	1,712,303	67.73%
7	Other Expenses (Rp/000)	1,394,514	63.78%	620,048	24.53%
	Amount	2,186,584	100%	2,528,210	100%

Source: Data Processed, 2021

The total production value received by non-partnered rubber farmers was Rp. 2,276,817,000 compared to farmers who partnered, which was Rp. 3,590,070,000. The magnitude of the production value of partnered rubber farmers compared to non-partnered farmers was influenced by the guarantee of the distribution of results received by partnered farmers. This guarantee guaranteed that latex prices for rubber farmers were stable compared to rubber farmers who did not partner. To make it clearer, the income difference between partnered and non-partnered rubber farmers is showed in Table 11.

Table 11. Income of Non-Partnered and Partnered Rubber Farmers

No	Description	Production Value (Rp/000)	Total cost (Rp/000)	Income (Rp/000)	Percentage (%)
1	Not Partnering	227.6817	2,186,584	90,233	7.83%
2	partner	3,590.070	2,528,210	1,061,860	92.17%
	Total	5866887.00	47148	1,152.093.00	100%

Source: Data Processed, 2022

Income is the result of reducing the value of production with the total cost received by rubber farmers. The total income of non-partnered and partnered rubber farmers can be seen in table 11. The income of non-partnered farmers was much lower than that of partnered farmers, which was Rp. 90,233,000 for farmers who did not partner, while those who partnered earned Rp. 1.061.860.000. The amount of the income was also influenced by the total costs incurred by farmers and the production value received by rubber farmers who did not partner and partnered. Differences in income occurred due to differences in the participation of farmers in participating in partnerships. Farmers who are under contract with the company have the freedom to produce,(Fitri et al., 2018).

According to (Desvo et al., 2019) cooperation can increase the selling value of agricultural products. This is because partner companies have an obligation to market partner farmers' products. Stable income and clear market access are the main reasons for farmers to join the partnership. Cooperation in partnership will provide benefits for both farmers and companies. Farmers will gain market access and increase income. This result is in accordance with research conduct by (Puspitaningrum and Gayatri, 2019) which states that the partners (companies) also benefit from this partnership activity. Based on this, rubber farmers should make partnerships because it will provide higher profits compared to non-partnership farmers. The bargaining power of farmers will be better when farmers are in a cooperative system, so the price offered is better. This will also make the government's program a success, which is related to the recommendation of farmers to join the partnership.

CONCLUSION

Based on the results of research and discussion on the impact of partnerships on the production and income of rubber farmers in Indonesia, some conclusions are drawn as follows. First, the partnership pattern for rubber farmers in Indonesia is the KOA partnership pattern. This pattern can be marked by the availability of land by partner groups, while the partner companies provide counseling, capital, costs, assistance for production facilities and guarantees for the distribution of their farming business results. On the impact of partnerships on the production of rubber farmers in Indonesia, there is no significant difference between the production of non-partnered and partnered rubber farmers. On the impact of partnership on the income of rubber farmers in Indonesia, there is a significant difference between the income of non-partnered and partnered rubber farmers.

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