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THE IMPACT OF CREDIT USE ON RUBBER FARMING INCOME IN SOUTH SUMATRA

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ABSTRACT

Indonesian rubber plantations are experiencing a fluctuating productivity trend due to difficult capital access, which is one of the problems faced by farmers. Agricultural credit serves as an alternative solution to this issue. Financial credit serves as a solution to address the capital issues faced by farmers, as the additional capital from credit can be used to enhance input utilization, thereby optimizing production. This research aims to analyze the impact of credit use on rubber farming in South Sumatra Province. This research uses secondary data, specifically the 2014 Agricultural Household Survey data from the Central Statistics Agency. The respondent farmers totaled 4,924 rubber farmers in South Sumatra, consisting of 98 farmers who took credit and 4,826 farmers who did not take credit. South Sumatra was chosen as the research location because it is the province with the largest natural rubber production in Indonesia. The methods used were the descriptive method and propensity score matching (PSM) to assess the impact of credit on rubber farming income. The results showed that the largest expense for rubber farming in South Sumatra was the labor cost component within the family, indicating that rubber farming in South Sumatra remains labor-intensive. The allocation of credit funds that has not yet been accurately targeted in agriculture as a whole is a factor contributing to the insignificance of credit in increasing farmers' income. Therefore, there is a need for extension services related to financial literacy so that credit funds can be optimized in agricultural practices.

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INTRODUCTION

Rubber plants play a significant role in the economy of more than 70% of plantation farming households, where rubber farming is the main livelihood. Indonesia's natural rubber production is the largest in the world after Thailand, amounting to 3.63 million tons in 2018. Indonesia's rubber exports reach 2.4 million tons per year, with 70 percent of these exports going to motor vehicle tire manufacturers in the United States. According to data from the Center for Agricultural Data and Information Systems in 2020, Indonesia has the largest rubber plantation area in the world, covering 3.67 million hectares. In line with the expansion of the rubber plantation area, the government has increasingly advocated for enhancing the export activities of raw rubber commodities to industrial countries that process rubber. This has led to a rise in raw rubber exports, thereby optimizing the utilization of existing rubber plantation land. The oligopolistic nature of the rubber market creates favorable preconditions for Indonesia, providing the country with a significant opportunity to become a leading player in the global rubber market (Lindung & Jamil, 2018).

South Sumatra is one of the main national rubber producers. From 2012 to 2021, among the four provinces with the largest rubber plantation areas on the island of Sumatra, South Sumatra has consistently been one of the provinces with the largest rubber plantation areas and production volumes, even for Indonesia as a whole. In 2017, South Sumatra's rubber production reached 1.03 million tons, increased to 1.04 million tons in 2018, decreased to 944.1 thousand tons in 2019, dropped further to 804.7 thousand tons in 2020, and then by 2021 it had decreased to 870 thousand tons, according to data from the Directorate of Plantations of the Ministry of Agriculture, in 2022.

As the center of rubber production with the highest output in Indonesia, South Sumatra Province plays a crucial role in the sustainability of rubber farming. However, when viewed from its productivity, rubber farming in South Sumatra has experienced a fluctuating trend, even tending to decline from 2012 to 2021. This decline can occur due to various obstacles faced by farmers, one of which is insufficient capital. The issues surrounding the availability of capital for farming lead to a lack of funds for purchasing production inputs, as there is a need for significant financing to meet the input requirements of rubber farming, such as seeds, fertilizers, pesticides, and labor.

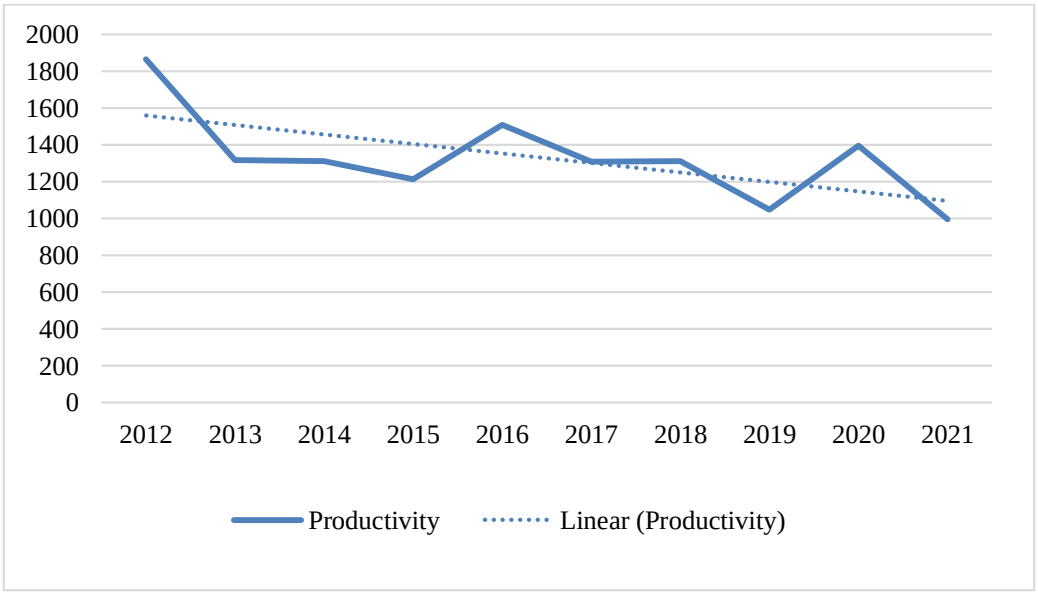

Figure 1.
South Sumatra rubber plantation productivity 2012-2021 (Kg per hectare)
Source : BPS (2022)

According to data from the Directorate General of Plantations (Ditjenbun) in 2022 ,the rubber plantations in South Sumatra are dominated by smallholder plantations, which account for 25% of the total area of rubber plantations in Indonesia. Therefore, smallholder plantations in South Sumatra make a significant contribution to the total production and productivity of national rubber. However, in terms of production, it is still dominated by private and state-owned plantations due to factors such as the increasing area of aging rubber plantations and the lack of replanting efforts. The economic lifespan of rubber plants reaches 25 years based on the conventional exploitation system (Agustina & Herlinawati ,2017; Riswani et al, 2020). After this age, the productivity of rubber plants declines, necessitating rejuvenation. However, the South Sumatra Plantation Office has recorded that at least 520,000 hectares out of the total 1.3 million hectares of rubber plantations in South Sumatra need to be rejuvenated because the plants are already 25 years old, and replanting aging rubber trees requires significant costs.

The decline in rubber productivity in South Sumatra is also attributed to one of the influencing factors, namely the low utilization of certified seedlings that produce high latex, as well as the occurrence of leaf fall disease caused by fungi. Higher costs are required to plant and maintain certified seedlings compared to ordinary seeds (Iskandar 2011; ; Sari et al, 2022; Dona et al, 2023), certified seedlings in rubber plantations do have higher productivity, however,

they require significant costs for purchasing and maintaining superior clones, while farmers have limited access to financing. Therefore, the financing methods directly related to the level of output obtained by farmers will also affect their income.

To increase farmers' income, productivity must be enhanced through the adoption of technology or optimization of inputs, however, this inevitably requires significant costs. According to Saputra (2022), capital has a significant relationship with income, the availability of sufficient capital in financial investments will enhance the efficiency of rubber farming enterprises. Capital is also crucial in supporting the increase in production and the standard of living of farmers, both in the provision of new technologies and production inputs (Suhaiza, 2022; Ernanda et al, 2019). Since rubber production in South Sumatra Province accounts for 21% of national production, this indicates that South Sumatra plays an important role in the sustainability of rubber plantation farming, which is one of Indonesia's leading commodities. However, rubber farmers still experience economic disparities. According to Mawardati (2015) The size of the amount of capital owned by farmers will affect the income they receive. Low capital also acts as a hindrance for rubber farmers to adopt technology. According to Puspitasari (2019), there still exists a disparity in rubber farmer income, many rubber farmers remain below the poverty line and have low levels of well-being. As a result of insufficient funding, intensive care for rubber plants cannot be carried out. Farmers are unable to purchase inputs such as pesticides and fertilizers, thereby significantly impacting production outcomes due to pest and disease attacks.

As an effort to increase farmers' income and improve the socio-economic conditions of Indonesian rubber farmers, financing rubber farming through credit has become one possible solution. According to Arja & Supijatno (2018), farmers face difficulties in obtaining capital for their farming activities, and capital determines how far farmers can sustain their operations. The use of credit for financing is intended to address the issues faced by farmers in optimizing input utilization. By optimizing the inputs used, it can shift the efficiency of rubber farming in South Sumatra to a higher level. If farmers have sufficient capital, replanting and renewing rubber trees can be carried out, leading to increased productivity. Capital constraints can be addressed through agricultural credit, however, access to financing is also a determining factor, as farmers' access significantly influences their income (Paloma et al., 2020). Additionally, farmers can purchase fertilizers and pesticides to provide intensive care for the rubber plants. Based on the above problem statement, the objectives of this research are: 1) To analyze the cost structure of rubber farming with and without credit in South Sumatra. 2) To analyze the impact of credit use on the income of rubber farming in South Sumatra.

RESEARCH METHOD

The data used for this research was secondary data from the 2013 Agricultural Census and the 2014 Plantation Farming Household Survey on rubber plantations conducted by the Central Statistics Agency (BPS) in South Sumatra Province. The data in this study remain relevant for analyzing the impact of credit programs on rubber farming income. Historical data can still be used in cross-sectional analyses as long as there are no significant changes in the main variables being analyzed and if the data still reflects the characteristics of the population or phenomenon at that time. According to BPS Publication (2022), changes in production volume and market conditions, as well as the underlying structure of rubber agriculture in Indonesia including the dominance of smallholder plantations and agronomic challenges remain relatively unchanged. This data is still relevant for analyzing long-term patterns and trends in the rubber plantation sector.

The total number of respondents in this study was 4,924, consisting of 4,826 farmers who did not take credit and 98 farmers who took credit. The data analysis in this research was conducted both quantitatively and qualitatively. Qualitative analysis used the descriptive method, while quantitative analysis employed the residual value method and propensity score matching (PSM). The PSM method is used to address the selection bias present in the research data, as the income of rubber farming in South Sumatra is influenced by factors beyond whether farmers take credit or not. By using the PSM method, the comparison of income between farmers who receive credit and those who do not will be more valid. PSM allows researchers to match farmers with similar characteristics from both groups, thereby reducing the influence of other variables that may affect income The descriptive method was used to describe the general characteristics of farmers with and without credit.

Analysis of Farming Costs

The cost concept in this study includes cash costs and non-cash costs (imputed costs), categorized into fixed and variable costs. Cash costs are the expenses directly or cash-financing the farming processes carried out by the farmers, while non-cash or imputed costs refer to resources used but not directly paid in cash (Hernanto, 2018). Cash costs in rubber farming include expenses for fertilizers, pesticides, levies, taxes, interest, land (rent), hired labor, equipment rental, fuel, and transportation. Imputed costs encompass family labor, depreciation costs, land rent (own land), and farming equipment rental (own equipment). The total cost of rubber farming is estimated as follows:

$$\mathrm{TC} = BT + BD$$

Note: TC is Total cost of rubber farming (IDR); BT is Cash costs of rubber farming (IDR); and BD is Imputed costs of rubber farming (IDR)

Farm Income Analysis

Revenue, also referred to as gross income, comes from the sales of products and has not yet been deducted from the costs incurred. According to Soekartawi, revenue is defined as the product, the quantity produced, and the selling price of the product. Total revenue consists of components from cash revenue and non-cash or imputed revenue. The systematic representation of farm income can be written as follows (Soekartawi (1995); and Sukiyono, et al (2024):

$$TR = Y . Py$$

Note: TR is Total revenue from rubber farming (IDR); Y is Quantity of dried rubber production (kg); and Py is Selling price of rubber harvest (IDR)

Farm Income Analysis

Farm income is the remuneration received by farmers as business capital owners, laborers, and managers. The remuneration received by a production factor can be calculated using the residual value method (McConnell and Dillon 1997). The residual value method calculates the remaining production value after paying for other production factors. The components of farm income measurement using the residual value method are gross farm income, total farm expenses, net farm income, and net farm earnings.

Propensity Score Matching (PSM)

The impact of credit on the income of rubber farming in South Sumatra is analyzed using the Propensity Score Matching (PSM) method. To estimate the impact of credit, the following equation is used:

$$Yi\ is\ \beta 0 + \beta i\ Xi + \varepsilon$$

Note: Yi is Outcome whose impact is being assessed; $\beta 0$ is Intercept (constant); $\beta i \ldots \beta n$ is Regression coefficients for each variable; $Xi \ldots Xn$ is Independent variables; and ε is Error term

The PSM method is a technique that can reduce bias caused by potential confounding, which usually poses problems in decision-making in observational research. PSM allows researchers to match farmers with similar characteristics from both groups, thereby reducing the influence of other variables that might influence income. The PSM method divides variables into two categories: treatment variables (credit farmers) and control variables (farmers without credit). In the PSM method, several steps need to be followed. The first step is to divide the research data into treatment and control groups. The second step is to choose a matching algorithm, which involves comparing the control group with

the treatment group based on their propensity scores using the Nearest Neighbor Matching (NNM) method, NNM method possesses several advantages over other matching methods, including its simple procedure and ease of interpretation, as well as requiring significantly less computational time compared to more complex matching techniques such as optimal matching or kernel matching. These benefits make it particularly advantageous in large-scale datasets. The third step is to check for overlap and common support by examining the distribution between the two groups being compared. The fourth step is to assess the quality of the matching, aiming to compare the initial state with the state after matching has been performed.

RESULT AND DISCUSSION

Farmer Characteristics

The respondents in this study have diverse characteristics, including age, gender, education level, land area owned, use of certified seeds, credit use, extension participation, cooperative membership, and partnerships. In South Sumatra, rubber farmers are predominantly male, aged between 36 and 55 years, with an average education level of elementary school graduation, education is one of the supporting factors for the success of farmers in carrying out their farming business, as the level of education greatly influences the ability of farmers to act and make decisions, such as absorbing innovations in managing their farming business (Arifin et al., 2012; Ivana et al., 2015; Badrudin et al., 2015). Most of the land used is owned by the farmers themselves, with an average land area ranging from 0.5 to 0.99 hectares, According to Sasmi et al. (2023), farmers' landholdings are limited, with an average of 1.56 hectares per household. The average number of household members among the respondent farmers is between 1 and 4 people. The majority of respondents are not members of farmer groups, do not belong to cooperatives, do not participate in extension services, do not engage in partnerships, and use non-certified seeds, the data from rubber farmers in South Sumatra shows that very few farmers use certified seeds. The low level of use of certified seedlings and seeds is due to the community's high trust in local seeds without ever calculating the actual level of production results achieved.

Rubber farmers with and without credit in South Sumatra are predominantly within the age range of 36-55 years, which is considered a productive age, with the youngest being 18 years old, an age deemed adequate for work. Among the respondents in the study, the majority of both credit and non-credit rubber farmers are not members of farmer groups. However, a higher percentage of credit farmers are members of farmer groups (24.49%) compared to farmers without credit (12.85%). The role of farmers' groups is crucial in providing inputs, information, and revitalizing food storage for farmers

(Priyono et al., 2014; Muis et al., 2022; Sriati & Santri 2023). Similarly, regarding extension participation and cooperative membership, most farmers are not involved in these programs. Nevertheless, the percentage of credit farmers involved in cooperatives (12.24%) and participating in extension programs (16.33%) is higher compared to farmers without credit, who are members of cooperatives (3.11%) and participate in extension services (5.16%). According to Munara (2021), the role of cooperatives in farming, particularly in providing inputs and production facilities such as fertilizers, pesticides, seeds, and others, has a significant impact on farmers' income. Cooperatives play a major role in efforts to improve farmers' welfare and according to Tanjung et al. (2020), extension services serve as a guide and an agent for the dissemination of information and technology to farmers.

Production Factors in Rubber Farming

Seeds

There is a difference between farmers who take credit and those who do not in the use of production factors, specifically seedlings, in their agricultural activities. For credit farmers, 51.23% of the average total seeds used come from purchases, while the remaining seeds are not purchased. In contrast, for farmers without credit, 67.55% or the majority of the seeds used are not purchased. The application of superior seeds affects both production and farmer income and significantly affects productivity levels and pest management in crops (Wati, 2022). Rubber farmers in Indonesia, particularly in South Sumatra, experience a decrease in demand for superior rubber seedlings when rubber prices decline. However, when rubber prices increase, farmers' interest in purchasing seedlings also rises. According to Syarifa et al. (2016), farmers' ability to purchase quality seedlings is often influenced by their economic conditions, and credit enhances the economy by providing additional capital. When farmers have access to credit, they are better able to buy high-quality seedlings to improve the productivity of their farms.

Productivity is also influenced by the type of seedlings used, according to Raditya et al. (2015), in terms of the type of seedlings used, both in terms of productivity and income, farmers who use certified seedlings have higher crop productivity and income compared to those who do not use certified seedlings. However, despite this, the data from rubber farmers in South Sumatra shows that very few farmers use certified seeds. The low level of use of certified seedlings and seeds is due to the community's high trust in local seeds without ever calculating the actual level of production results achieved.

Fertilizer

Fertilizer is one of the production factors that determines the yield of rubber production, the amount of rubber fertilizer affects the acquisition of

rubber production (Setyawan et al., 2016). Fertilizers can enhance productivity, improve product quality, and extend the economic lifespan of rubber plants. The presence of nitrogen, phosphorus, and potassium is essential for optimal growth. A deficiency in these nutrients can lead to stunted growth and reduced latex yields. For both credit and non-credit farmers, the most commonly used fertilizer is urea, with an application rate of 188.23 kg per hectare for credit farmers and 147.72 kg per hectare for farmers without credit. According to Suharyon (2021) credit helps rubber farmers obtain more fertilizers to enhance productivity, it enables farmers to overcome liquidity constraints, allowing them to purchase the necessary fertilizers.

The second most frequently used fertilizer varies between the two groups: farmers without credit use NPK fertilizer at 56.18 kg per hectare, while credit farmers use KCL fertilizer at 73.24 kg per hectare. KCl fertilizer can optimize production and improve the quality of latex production by enhancing the formation of plant cell wall structures, due to its high potassium content (Nurhalim, 2020). KCl fertilizer is generally more expensive per kilogram compared to NPK fertilizer due to its more specific content. The least used fertilizer for both credit and non-credit farmers is ZA. farmers without credit use an average of 3.35 kg per hectare, whereas credit farmers do not use ZA fertilizer at all. According to the research by Andrijanto et al. (2015), the results of the rubber plants fertilized and those not fertilized showed a significant difference. The observation indicated that the yield of the rubber plants fertilized was higher than those not fertilized.

Pesticides and Other Production Factors

In South Sumatra, both credit and non-credit rubber farmers spend more on liquid pesticides compared to solid pesticides. Based on the research by Arsi et al. (2022), the appropriate use of pesticides and fertilizers can enhance the resilience of rubber plants against diseases and pests. farmers without credit allocate 1.07% of their total costs to liquid pesticides and only 0.03% to solid pesticides. For credit farmers, the expenditure on liquid pesticides is as much as 4.20% of their total costs, while solid pesticides contribute just 0.02%. Rubber farmers with access to credit tend to use more liquid pesticides compared to those without access to credit, due to the availability of funds. Liquid pesticides are easier to apply, provide broader pest control, and deliver quicker results compared to solid pesticides. Thus, the total cost for pesticide use is 4.22% for credit farmers and 1.10% for farmers without credit. Additionally, credit farmers have higher depreciation costs compared to non-credit farmers.

Cost Structure of Rubber Farming in South Sumatra

The cost structure allows farmers to examine how financial resources are allocated in agricultural enterprises. Cost structure juga mencerminkan tingkat adopsi tenologi pertanian yang dilakukan oleh petani (Voiku & Varlamov, 2019). For that reason, it is necessary to consider the allocation of capital and finances in the cost structure of agricultural activities to maximize farmers' income, as this is crucial because the cultivation of certain commodities depends on the agricultural income generated by farmers (Ulma et al., 2023; Sriyoto & Sumantri., 2016; Sureshkumar et al. 2014). In this study, costs are classified into cash costs, which are the expenses paid by farmers in the farming process, and non-cash costs. The total cost is the sum of cash and non-cash costs. The cash cost incurred by farmers without credit is 17.56% of the total cost, amounting to IDR 3,938,172 per hectare per year, with the largest component being fuel costs totaling IDR 1,210,409 or 5.30% of the total cost. In contrast, the cash cost for credit farmers is 33.15% of the total cost, amounting to IDR 7,574,684 per hectare per year, with the largest component being Additional Labor Costs (TKLK) totaling IDR 2,352,181 or 10.29% of the total cost (Table 1). Credit farmers spend more on fertilizers and pesticides compared to farmers without credit. The unpredictable price fluctuations in traditional markets cause farmers to receive relatively low prices, resulting in agricultural production income that is not yet sufficient for economic development. Therefore, a well-planned strategy is required, taking into account the components of the agricultural cost structure (Romdhon, 2015).

In Table 1, it can also be observed that the non-cash costs for farmers without credit are higher compared to credit farmers, amounting to IDR 18,486,087 (80.90% of the total costs), while for credit farmers, the non-cash costs are IDR 13,678,599 (59.86% of the total costs). The largest component for both credit and non-credit farmers is the cost of family labor (TKDK). Credit farmers spend IDR 7,574,684 (33.82% of the total costs) on family labor (TKDK), whereas farmers without credit spend IDR 11,650,398 (50.98% of the total costs) on family labor (TKDK).

According to the research by Lay et al. (2018), the total non-cash costs incurred by farmers are greater than the cash costs due to the component of labor costs within the family. In terms of total costs incurred, farmers without credit have a higher value at IDR 22,851,579, compared to credit farmers at IDR 22,766,343. From the cost structure, it can be observed that the rubber farming in South Sumatra still exhibits labor-intensive characteristics and lacks capital intensity. Therefore, there is a need for development from inputs to technology to enhance production and income. Because capital determines how far farmers can sustain in agriculture and income is a measure of the farmers' well-being.

Table 1. Cost Structure of Rubber Farming in South Sumatra

Cost Component	Without Credit		With Credit	
	Value (IDR)	(%)	Value (IDR)	(%)
Cash Costs				
Fixed Costs				
Land Rent	136,946	0.61	-	-
Equipment Rental	8,526	0.04	966	0.01
Interest	-	-	1,817,501	8.11
Tax	143,248	0.64	126,737	0.57
Levies	60,511	0.27	124,659	0.56
Fuel	1,244,657	5.55	1,210,409	5.40
Transportation	563,542	2.51	631,682	2.82
Variable Costs				
Seeds	38,995	0.17	8,311	0.04
Fertilizer	299,894	1.34	355,270	1.58
Pesticides	245,786	1.10	946,968	4.22
Family Labor(TKLK)	1,196,066	5.33	2,352,182	10.49
Total Cash Costs	3,938,172	17.56	7,574,358	33.78
Non-Cash Costs				
Fixed Costs				
Land (Own)	5,538,999	24.70	4,253,845	18.97
Equipment (Own)	649,092	2.89	822,387	3.67
Depreciation	628,867	2.80	864,157	3.85
Variable Costs				
Seeds	18,732	0.08	8,731	0.04
Family Labor (TKDK)	11,650,398	51.95	8,729,479	38.93
Total Non-Cash Costs	18,486,087	82.44	14,678,599	65.46
Total Costs	22,851,259	100.00	22,470,957	100.00

Rubber Farming Revenue in South Sumatra

The average revenue for credit rubber farmers is IDR 30,449,853 per hectare per year, which is not significantly different from farmers without credit, who average IDR 30,384,890 per hectare per year. Farm production with adequate production factors and strong capitalization will be higher and have implications for their income (Manalu et al., 2018; Yasminta, 2023; Daini *et al.*, 2020; Fadhla, 2017). Farmers who utilize financial credit tend to have better access to necessary inputs, including fertilizers and agricultural tools, which can enhance the quality and quantity of rubber yields. This provides an advantage in marketing, as high-quality rubber tends to attract higher prices (Aini & Rusdiayana, 2017). However, challenges remain regarding the optimal

utilization of the provided credit. Production levels are also similar between credit and non-credit farmers, with a slight average difference of only 21 kg more for credit farmers per hectare per year, as shown in Table 2. This similarity is partly due to the higher use of fertilizers and pesticides by credit farmers.

Table 2. Structure of Rubber Farming Revenue in South Sumatra

Revenue Component	Without Credit		With Credit	
	Mean	St. Dev	Mean	St. Dev
Production (Kg)	3,955.24	2,694.31	3,971.17	2,329.51
Rubber Price (IDR)	7,682	1.90	7,668	2.01
Cash Revenue (IDR)	30,022,974	21,563.50	30,079,950	19,733.34
Non-Cash Revenue (IDR)	361,917	3,392.87	369,904	1,638.82
Total Revenue (IDR)	30,384,890	21,422.46	30,449,853	19,887.60

Rubber Farming Income in South Sumatra

The measures used to calculate the income of rubber farmers in South Sumatra in this study are gross farm income, cash income, net farm income, and net farm earnings. Farm income is highly dependent on the level of receipts and expenses incurred during the farming period (Wijaya et al., 2012; Hasriati *et al.* 2019) and according to Aulina et al. (2021), farm income, which serves as a measure of farmers' well-being, experiences fluctuating conditions due to changing market prices. Table 3 present the income components of rubber farming.

Table 3. Rubber Farming Income Measures in South Sumatra

Income Components	Without Credit		With Credit	
	Mean (IDR)	St. Dev	Mean (IDR)	St. Dev
Cash Expense	3,938,172	6,006.30	7,574,358	8,010.54
Non-Cash Expense	18,486,087	16,210.24	14,678,599	7,923.03
Total Expense	22,851,259	17,468.05	22,765,284	14,078.46
Farm Expense	10,773,861	9,839.44	10,706,304	7,002.29
Gross Farm Income	30,384,890	21,422.46	30,449,853	19,887.60
Cash Income	26,446,719	19,876.22	22,875,169	18,438.63
Net Farm Income	19,611,029	17,877.73	19,743,456	18,645.08
Net Farm Earning	19,611,029	17,877.73	18,064,070	18,098.32

As presented in Table 3, the average gross farm income for credit farmers is higher, amounting to IDR 30,449,853, while for farmers without credit it is IDR

30,384,890, as shown in Table 3. The average cash expenses for credit farmers are higher than for farmers without credit, so the cash income for farmers without credit is higher due to the relatively small difference in gross farm income between credit and non-credit farmers. For net farm income, credit farmers have a higher value compared to farmers without credit, amounting to IDR 19,743,456 for credit farmers and IDR 19,611,029 for farmers without credit. This value is derived from net farm income minus farm expenses. However, the average net farm earnings for credit farmers are lower than for farmers without credit due to the interest burden that must be paid. As a result, the average net farm earnings for credit farmers amount to IDR 18,064,070.

The Impact of Credit on Rubber Farming Income

The rubber farming income in South Sumatra was analyzed using Propensity Score Matching (PSM). The analysis results shown in Table 4 indicate that the production of farmers with credit is higher but not significantly different from that of farmers without credit. Funds obtained from credit can increase income by enhancing agricultural production. These credit funds are utilized to meet the input needs of agricultural enterprises, such as labor, the use of agricultural tools, and all necessities in the agricultural process (Rumiati et al., 2024; Darus & Kurniati, 2018; Rozci & Laily, 2023). However, in reality, credit obtained by rubber farmers is often not utilized optimally for agricultural activities, including the purchase of fertilizers, pesticides, or other productive investments. The credit funds received by farmers are often allocated for consumptive needs or activities outside the agricultural sector, such as home renovations, repayment of other debts, or daily necessities. This results in suboptimal use of credit in enhancing the productivity of rubber farming.

Table 4. Differences in Rubber Farming Income in South Sumatra with and without Credit

Variable	Sample	With Credit	Without Credit	Difference	T-test
Production (Kg)	Unmatched	3,971.171	3,955.238	15.93322	0.06
	ATT	3,971.171	3,823.774	147.3968	0.46
Cost (IDR)	Unmatched	22,766.3	22,851.58	-85.2827	-0.05
	ATT	22,766.3	21,596.96	1,169.337	0.56
Income (IDR)	Unmatched	8,894.828	7,020.54	1,874.288	1.09
	ATT	8,894.828	6,874.701	2,020.127	0.93

After matching using PSM, it was found that the production between credit and non-credit farmers is not significantly different, resulting in their total income also not differing much, with only a difference of IDR 2,020,127. The

increase in average production is also due to the increased use of production inputs by credit farmers, such as fertilizers, pesticides, and others. In terms of costs, there is also a difference in the price levels incurred by credit and non-credit farmers, where the costs incurred by credit farmers are higher than those of non-credit farmers, with a cost difference of IDR 1,169,340. This difference in the level of costs incurred is due to the interest burden on the loans that credit farmers must pay. The non-significant difference between the income of credit and non-credit farmers is due to the allocation of credit by farmers not being fully utilized for farming activities. Credit has a positive impact on farmers' income, however, the effect is quite small and statistically insignificant due to suboptimal allocation (Feryanto, 2015). This is also related to the dominance of smallholder farmers in rubber plantations in South Sumatra. Many smallholder farmers still experience low welfare (Puspitasari, 2019), which leads to credit funds not being directly used for farming activities but instead allocated for consumption needs, resulting in suboptimal use of funds for agricultural purposes. Additionally, barriers such as a lack of understanding among farmers regarding financial management and insufficient oversight of credit usage often serve as major factors, highlighting the need for extension services related to the allocation of agricultural credit funds to ensure optimal use of these funds. According to Mulyaqin (2013), credit in farming will benefit farmers in terms of capital for purchasing production inputs if it is also utilized in the entire farming process.

The perception of farmers towards financial credit is quite high because it can assist with capital during the maintenance of rubber plants; however, there are still doubts among farmers regarding the procedures and requirements necessary to obtain credit (Dahlia et al., 2024). Although access to credit allows farmers to meet input shortages in their farming activities, the procedures for obtaining such credit can sometimes be challenging for them. A significant number of farmers refrain from taking out loans because they perceive the process as overly complicated and rigid. Furthermore, inadequate comprehension of loan products and related risks further contributes to farmers' difficulties in accessing formal funding (Wahyuni et al, 2020). With a good understanding of interest rates, loans, and debt management, farmers can optimize their working capital and reduce financial burdens. According to Guampe et al. (2024), financial literacy aids farmers in making more informed decisions regarding resource management and access to financial services such as credit and insurance.

CONCLUSION AND SUGGESTION

Conclusion

Based on the research conducted on the analysis of the income differences in rubber farming in South Sumatra province between credit and non-credit farmers, several conclusions were obtained as follows:

1. In the cost component for both credit and non-credit farmers, the largest component is family labor costs, indicating that the characteristic of rubber farming in South Sumatra is labor-intensive farming. There is a need to focus on the development and dissemination of appropriate agricultural technologies for small and medium enterprises that are easy to understand and use without requiring advanced skills.
2. Credit has a positive impact and benefits rubber farmers in South Sumatra in terms of production, total income, and revenue. However, statistically, it has not shown a significant difference. Supervision and guidance in the allocation of credit within agricultural enterprises must be enhanced, as it is not uncommon for funds provided through credit programs to be misallocated, resulting in the failure to achieve the intended funding targets.

Suggestion

Based on the results of this research, the following suggestions are provided:

1. Farmers should join cooperatives and establish partnerships with supporting companies, as these can assist farmers in providing inputs, capital, and information related to funding.
2. Extension activities by the government or external parties are very helpful for farmers in improving their knowledge and understanding of farming processes, and identifying critical points in farming, whether in input provision or optimal input allocation, from upstream to downstream. Therefore, farmers should participate in extension programs to increase their farming productivity.
3. Assistance from relevant parties to farmers regarding credit programs and the use of credit funds is necessary; therefore, these credit programs can provide maximum benefits for the farming outcomes achieved by the farmers.
4. There is a need for training related to financial literacy so that farmers can effectively plan their agricultural capital, as the largest component of farming costs is non-cash expenses, particularly family labor costs,

which are often overlooked. Therefore, extension services and training on financial management and financial literacy are essential.

REFERENCES

Aditiya, S., & Lastinawati, E. (2023). Faktor-Faktor Yang Memengaruhi Pendapatan Petani Karet Di Desa Bumi Say Agung Kecamatan Bumi Agung Kabupaten Way Kanan. *Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis*, 9(2), 2164-2175. doi: 10.25157/ma.v9i2.10284

Afif, M., Purwoko, g., & Arianti, N. N. (2016). Ketimpangan Distribusi Penerimaan Rumah Tangga Petani Karet Di Desa Margo Mulyo Kecamatan Pondok Kubang Kabupaten Bengkulu Tengah. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 15(2), 177-187. doi: 10.31186/jagrisep.15.2.177-188

Agustina, D. S., & Eva Herlinawati. (2017). Komparasi Kelayakan Investasi Klon Karet Gt 1 Dan Pb 260 Pada Berbagai Tingkat Harga Dan Umur Ekonomis. *Jurnal Penelitian Karet*, 35(1), 83-92. doi: 10.22302/ppk.jpk.v1i1.362

Aini, Y., & Rusdiyana, E. (2017). Analisis Strategi Pemasaran Komoditas Karet Di Kabupaten Rokan Hulu. *Jurnal Ilmiah Cano Ekonomos*, *6*(1), 39-50. Retrieved from https://www.neliti.com/publications/59810/analisis-strategi-pemasaran-komoditas-karet-di-kabupaten-rokan-hulu

Andrijanto, A. D., Kamo, & Legowo, A. M. (2015). Pengaruh Jenis Pupuk Terhadap Produksi Lateks Tanaman Karet (*Hevea brasiliensis*) Dalam Aspek Bisnis Terhadap Pendapatan Pekerja Sadap Dan Laba Perusahaan Perkebunan Tlogo. *AGROMEDIA*, 33(1), 88-96. Retrieved from https://jurnalkampus.stipfarming.ac.id/index.php/am/article/view/107/109

Arifin, Z., Sritoyo, & Yuliarti, E. (2012). Analisis Pendapatan Dan Nilai Tukar Petani Karet Rakyat Di Desa Air Sekamanak Kecamatan Ketahun Kabupaten Bengkulu Utara. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 11(1), 113-124. doi: 10.31186/jagrisep.11.1.113-124

Arsi, SHK, S., Hamidson, H., & Gunawan, B. (2022). Teknik Budidaya Petani Tanaman Karet (*Hevea brasiliensis*) Terhadap Hama Dan Penyakit Di Kecamatan Tanjung Batu, Kabupaten Ogan Ilir. *Seminar Nasional Lahan Suboptimal*, 10(1), 898-909. Retrieved from https://conference.unsri.ac.id/index.php/lahansuboptimal/article/view/2468

Aulina, P. O., Sriyoto, & Yuliarti, E. (2021). Analisis Faktor-Faktor Yang Mempengaruhi Pendapatan Rumah Tangga Petani Karet Desa Benteng

Harapan Kecamatan Maje Kabupaten Kaur. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 20(2), 397 – 410. doi: 10.31186/jagrisep.20.2.397-410

Badan Pusat Statistika (2018). *Statistik Karet Indonesia 2018.* Jakarta: BPS. Retrieved from https://www.bps.go.id/id/publication/2019/11/22/c73bdba12c1f122edae18a29/statistik-karet-indonesia-2018.html

Badan Pusat Statistika (2019). *Statistik Karet Indonesia 2019.* Jakarta: BPS. Retrieved from https://www.bps.go.id/id/publication/2020/11/30/bbe0914bad45c64c87c005fb/statistik-karet-indonesia-2019.html

Badan Pusat Statistika (2020). *Statistik Karet Indonesia 2020.* Jakarta: BPS. Retrieved from https://www.bps.go.id/id/publication/2021/11/30/bc85ddce5e674dc744b69abb/statistik-karet-indonesia-2020.html

Badan Pusat Statistika. (2021). *Statistik Karet Indonesia 2021.* Jakarta: BPS. Retrieved from https://www.bps.go.id/id/publication/2022/11/30/d5b4f514cb426ec27abeebd0/statistik-karet-indonesia-2021.html

Badrudin, S., & Sumantri, B. (2016). Kajian Peningkatan Pendapatan Pengrajin Gula Kelapa Di Desa Purbosari Kecamatan Seluma Barat Kabupaten Seluma. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 16(1), 37–44. doi: 10.31186/jagrisep.15.1.37-44

Dahlia, Silalahi, F. R., & Iskandarini. (2024). Persepsi Petani Terhadap Program Kredit Usaha Rakyat Pertanian Di Kecamatan Bandar Kabupaten Bener Meriah. *Jurnal Agrica Ekstensia*, 18(1), 25-35. Retrieved from https://repository.pertanian.go.id/handle/123456789/23631

Daini, R., Iskandar, & Mastura. (2020). Pengaruh Modal Dan Luas Lahan Terhadap Pendapatan Petani Kopi Di Desa Lewa Jadi, Kecamatan Bandar, Kabupaten Bener Meriah. *J-ISCAN: Journal Of Islamic Accounting Research*, *2*(2), 136-157. Retrieved from https://www.neliti.com/publications/338835/pengaruh-modal-dan-luas-lahan-terhadap-pendapatan-petani-kopi-di-desa-lewa-jadi

Dona, J. E., Sutiknjo, T. D., & Artini, W. (202). Peranan Perawatan terhadap Pendapatan Usahatani Karet Kecamatan Gunung Purei Kabupaten Barito Utara. *Jurnal Ilmiah Nasional Mahasiswa Pertanian (JINTAN)*, 3(1), 112-116. Retrieved from http://ojs.unik-kediri.ac.id/index.php/jintan

Ernanda, R., Burhanuddin, & Purwono, J. (2019). Karakteristik Modal Sosial Petani Cabai Kopay Di Kota Payakumbuh. *Jurnal AGRISEP: Kajian*

Masalah Sosial Ekonomi Pertanian Dan Agribisnis, 18(1), 41 – 52. doi: 10.31186/jagrisep.18.1.41-52

Fadhla, T. (2017). Analisis Manajemen Usaha Tani Dalam Meningkatkan Pendapatan Dan Produksi Padi Sawah Di Kecamatan Tangan-Tangan Kab. Aceh Barat Daya. *Jurnal Visioner & Strategis*, 6(2), 9-23. Retrieved from https://journal.unimal.ac.id/visi/article/view/299

Guampe, F. A., et al. (2024). Pengaruh Literasi Keuangan Terhadap Kinerja Petani Padi Sawah di Kecamatan Pamona Puselemba Kabupaten Poso. *Jurnal Riset Rumpun Ilmu Tanaman (JURRIT)*, *3*(1), 1-9. doi: 10.55606/jurrit.v3i1.2803.

Hamdani, M., Rozanlina, & Zain Basriwijaya, K. M. (2023). Faktor-Faktor Yang Mempengaruhi Produktivitas Penyadap Tanaman Karet Di PT. Atjeh Raya Corpindo Kebun Alur Buluh. *JURNAL AGRICA*, 16(2), 190-200. doi: 10.52850/jsea.v14i1.467

Ivana, H., Priyono, B. S., & Reflis. (2012). Korelasi Faktor Sosial Ekonomi Dengan Penerimaan Usaha Perkebunan Kelapa Sawit Rakyat Di Desa Nanti Agung,Kecamatan Ilir Talo,Kabupaten Seluma. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 11(1), 69–77. doi: 10.31186/jagrisep.11.1.69-77

Kurniati, S. A., & Darus. (2018). Optimalisasi Input dan Pengaruhnya terhadap Produksi Usahatani Bawang Merah di Desa Sungai Geringging Kecamatan Kampar Kiri Kabupaten Kampar. *Dinamika Pertanian*, *34*(3), 34-39. doi: 10.31258/unricsagr.1a5

Lay, S. M. P., Kapa, M. M.J., & Telnoni, H. L. (2018). The Allocation Of Women Labors And Their Contribution Of The Income Of Maise Farmer Househods In Mnealete Village Amanuban Barat Sub-District, Timor Tengah Selatan Regency. *Buletin Imiah IMPAS*, 20(1), 58-66. Retrieved from https://ejurnal.undana.ac.id/index.php/impas/article/view/651

Lindung, & Jamil, A. S. (2018). Posisi Daya Saing Dan Tingkat Konsentrasi Pasar Ekspor Karet Alam Indonesia Di Pasar Global. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 17(2), 119-128. doi: 10.31186/jagrisep.17.2.119-128

Manalu, A. S., Sumantr, B., & Priyono, B. S. (2018). Pendapatan Berdasarkan Status Penguasaan Lahan Usahatani Tembakau Dan Pemasarannya. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 17(1), 63–78. doi: 10.31186/jagrisep.17.1.63-78

Mawardati. (2015). Analisis Faktor-Faktor Yang Mempengaruhi Pendapatan Usahatani Pinang Kecamatan Sawang Kabupaten Aceh Utara.

AGRISEP, 16(1), 61-65. Retrieved from https://jurnal.usk.ac.id/agrisep/article/view/3032/2893

Muis, M., et al. (2022). Peran Kelompok Tani Dalam Peningkatan Pendapatan Petani Padi (*Oryza sativa L*). *Jurnal Agrisistem: Seri Sosek dan Penyuluhan*, 18(1), 46-54. doi: 10.52625/j-agr-sosekpenyuluhan.v18i1.228

Munara, I. (2021). Peran Koperasi Terhadap Peningkatan Produksi Dan Kesejahteraan Petani Kopi Di Koperasi Serba Usaha (KSU) Permata Gayo, Kecamatan Permata, Kabupaten Bener Meriah, Provinsi Aceh. *Jurnal Ilmiah Mahasiswa Pertanian*, 1(2), 1-15. Retrieved from https://jurnalmahasiswa.umsu.ac.id/index.php/jimtani/article/view/253

Paloma, C., et al. (2020). Pengaruh Aksesibilitas Pembiayaan Terhadap Pendapatan Petani Kopi Di Lembah Gumanti, Kabupaten Solok. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 19(2), 301-314. doi: 10.31186/jagrisep.19.2.301-314

Perdana, R. P. (2019). Kinerja Ekonomi Karet Dan Strategi Pengembangan Hilirisasinya Di Indonesia. *Forum Penelitian Agro Ekonomi*, 37(1), 25-39. doi: 10.21082/fae.v37n1

Priyono, B. S., Sriyoto, & Yuliarso, M. Z. (2014). Revitalisasi Lumbung Pangan Melalui Pemberdayaan Kelompok Tani Di Kabupaten Seluma Propinsi Bengkulu. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 14(1), 92 – 103. doi: 10.31186/jagrisep.13.1.91-102

Puspitasari, A. (2016). Upaya Alternatif Petani Karet Dalam Memenuhi Kebutuhan Hidup Keluarga (Studi Penelitian di Dusun Pungkin Kecamatan Sekadau Kabupaten Sekadau Hilir). *Sociodev*, 5(4), 1-7. Retrieved from https://jurmafis.untan.ac.id/index.php/sociodev/article/view/1228/pdf_94

Puspitasari, M. S., & Primalasari, I. (2019). Analisis Tingkat Pendapatan Dan Kesejahteraan Rumah Tangga Petani Karet Di Kecamatan Muara Beliti Kabupaten Musi Rawas. *Societa*, 8(1), 10–20. doi: 10.32502/jsct.v8i1.2026

Raditya, R., Asriani, P. S., & Sriyoto. (2015). Analisis Komparasi Usahatani Padi Sawah Pengguna Benih Bersertifikat Dan Benih Non Sertifikat Di Kelurahan Kemumu Kecamatan Arma Jaya Kabupaten Bengkulu Utara. *AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 15(2), 177-186. doi: 10.31186/jagrisep.14.2.177-188

Riswani, R., et al. (2020). Kelayakan Replanting Karet Pada Kondisi Mutu Bokar Dan Harga Jual Yang Rendah Di Kabupaten Muara Enim Sumatera

Selatan. *AGRISOCIONOMICS Jurnal Sosial Ekonomi dan Kebijakan Pertanian*, 4(1), 147-161. doi: 10.14710/agrisocionomics.v4i1.6363

Romdhon, M. M. (2009). Struktur Biaya Dan Skala Usaha Ekonomis Penggilingan Kopi Bubuk Di Kota Bengkulu. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 10(1), 35-47. doi: 10.31186/jagrisep.8.2.35-47

Rozci, F., & Laily, D. W. (2023). Pengaruh Kredit Pertanian Terhadap Kesejahteraan Petani Di Indonesia. *Jurnal Ilmiah Manajemen Agribisnis*, 11(2), 92-102. doi: 10.33005/jimaemagri.v11i2.15

Saputra, F. (2022). Faktor-Faktor Yang Mempengaruhi Pendapatan Usaha Tani Karet Di Desa Salah Sirong Kecamatan Jeumpa Kabupaten Bireuen. *Jurnal Sains Pertanian*, 6(1), 42-47. doi: 10.51179/jsp.v6i1.1734

Saragi, C. P., & Gea, P. (2023, Juni). Analisis Biaya Produksi Dan Pendapatan Petani Karet Rakyat. *Jurnal Agriust*, 3(2), 38-43. doi: 10.54367/agriust.v3i2.3498

Sari, A. G., Evahelda, & Purwasih, R. (2022). Pendapatan Rumah Tangga Petani Karet Di Desa Kemuja Kecamatan Mendo Barat Kabupaten Bangka. *Edunomika*, 6(2), 1-10. doi: 10.29040/jie.v6i2.5963

Sasmi, M., Agustar, A., Syarfi, I. W., & Hasnah. (2023). Dinamika Ekonomi Petani Karet. *Jurnal Agri Sains*, 7(1), 32-47. doi: 10.36355/jas.v7i1.1009

Setyawan, E., Subantoro, R., & Prabowo, R. (2016). Analisis Faktor Yang Berpengaruh Terhadap Produksi Karet Di PT Perkebunan Nusantara IX Kebun Sukamangli Kabupaten Kendal. *MEDIAGRO*, 12(1), 35-44. doi: 10.31942/mediagro.v12i1.1609

Sriati, S., & Rismarini, R. (2022). Kinerja Gabungan Kelompok Tani Dalam Meningkatkan Pendapatan Petani Karet Di Kecamatan Banyuasin III, Kabupaten Banyuasin, Provinsi Sumatra Selatan. *Jurnal Penyuluhan*, 18(1), 1-11. doi: 10.25015/18202235518

Sriati, S., & Santri, Z. (2023). Hubungan Peran Kelompok Tani Dengan Produksi Dan Pendapatan Usahatani Jagung Di Desa Bumi Agung Jaya, Buay Rawan Ogan Komering Ulu Selatan. *Seminar Nasional Lahan Suboptimal*, 11(1), 696-705. Retrieved from https://conference.unsri.ac.id/index.php/lahansuboptimal/article/view/2871

Sriyoto, & Sumantri, B. (2016). Kajian Peningkatan Pendapatan Pengrajin Gula Kelapa Di Desa Purbosari Kecamatan Seluma Barat Kabupaten Seluma. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 16(1), 37–44. doi: 10.31186/jagrisep.15.1.37-44

Suhaiza, S. (2022). Pengaruh Modal Dan Biaya Produksi Terhadap Pendapatan Bisnis Pertanian Karet (Studi Pada Pertanian Karet Desa Kadur, Rupat Utara, Bengkalis). *JOM FSIP*, 9(1), 1-14. Retrieved from

https://jom.unri.ac.id/index.php/JOMFSIP/article/view/33390

Suharyon. (2021). Potensi, Kendala Dan Solusi Peremajaan Karet Dalam Mewujudkan Pertanian Maju Mandiri-Modern Di Tengah Perubahan Iklim Dan Pandemi Covid 19 Di Provinsi Jambi. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 5(1), 48-56. doi: 10.22437/jiituj.v5i1.12999

Sukiyono, K., Herdjiono, M. V. I., Romdhon, M. M., & Kurniati, D. (2024). Pengukuran Kinerja Usaha: Terapan pada Usahatani dan UMKM. IPB Press

Sureshkumar, A. P., Asodiya, P. S., Parmar, V. K., & Patel, K. S. (2014). Input Use, Costs Structure, Return And Resource Use Efficincy Analysis Of Wheat Crop In South Gujarat, India. *International Journal Of Agricultural Extension*, 2(1), 5-12. Retrieved from https://esciencepress.net/journals/index.php/IJAE/article/view/556

Syarifa, L. F., et al. (2016). Dampak Rendahnya Harga Karet Terhadap Kondisi Sosial Ekonomi Petani Karet Di Sumatera Selatan. *Jurnal Penelitian Karet,* 34(1), 119-126. doi: 10.22302/ppk.jpk.v34i1.218

Tanjung, H. B., Wahyuni, S., & Ifdal. (2020). Peran Penyuluh Pertanian Dalam Budidaya Padi Salibu Di Kabupaten Tanah Datar Provinsi Sumatera Barat. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, 19(2), 229–240. doi: 10.31186/jagrisep.19.2.229-240

Ulma, R. O., et al. (2023). Assessing The Cost Structure, Income, And Efficiency Of Red Chili Farming In Kayu Aro District, Kerinci Regency, And Implications For Rural Government Policies. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis*, *22*(2), 409-426. doi: 10.31186/jagrisep.22.2.409-426

Voiku, I., & Varlamov, G. (2019). Cost Structure–An Important Indicator Of Innovation Activity In Agro-Industrial Complex (By The Example Of Crop Production). *In E3S Web of Conferences* 112(1),1-7. EDP Sciences. doi: 10.1051/e3sconf/201911203015

Wahyuni, S., et al. (2020). Dinamika Kredit Program Dan Perspektif Skema Baru Kredit Usaha Rakyat Untuk Pembiayaan Pertanian Tahun 2020–2024. *Forum Penelitian Agro Ekonomi*, 38(2), 103-117. doi: 10.21082/fae.v38n2.2020.

Wati, H. D. (2022). Penerapan Pengendalian Hama Terpadu (PHT) Dalam Meningkatkan Pendapatan Petani Padi Di Desa Sindir Kecamatan Lentengkabupaten Sumenep. *CEMARA*, 19(2), 33-46. doi: 10.24929/fp.v19i2.2235

Wijaya, D., Utama, W. P., & Cahyadinata, I. (2012). Analisis Pendapatan Dan Pemasaran Usahatani Brokoli (Brassica Oleracea L.) Di Desa Muara Perikan Kecamatan Pagaralam Selatan Kotamadya Pagaralam. *Jurnal*

AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis, 11(2), 173–186. doi: 10.31186/jagrisep.11.2.173-186

Yasmita, I. G. A. L. (2023). Pengaruh Modal, Luas Lahan Dan Teknologi Terhadap Pendapatan Petani Padi Di Subak Sempidi, Kecamatan Mengwi, Kabupaten Badung. *Jurnal Ganec Swara*, 17(2), 429 - 439. Retrieved from https://journal.unmasmataram.ac.id