JUATIKA
JURNAL AGRONOMI TANAMAN TROPIKA
VOL. 7 NO. 2 May 2025

DOI :https://doi.org/10.36378/juatika.v7i2.4825
eissn 2656-1727
pissn 2684-785X
pages : 687 – 693

RESEARCH ARTICLE Open Access

Increasing the Productivity of Oil Palm (*Elaeis guineensis* Jacq) Farmers in Tebing Linggahara Baru Village, Bilah Barat District, Labuhanbatu Regency

Aulia Fakhrezi[1,*], Khairul Rizal[1], Yudi Triyanto[1], Dini Hariyati Adam[1]

Abstract

Oil palm has significant potential as a strategic commodity to enhance farmers' income while contributing substantially to Indonesia's foreign exchange earnings. This study aims to examine the role of farmer groups in supporting the productivity of smallholder oil palm farmers. The research was conducted in Tebing Linggahara Baru Village, Bilah Barat District, Labuhanbatu Regency. An associative research design with a descriptive-quantitative survey method was employed. Data were collected through questionnaires and documentation from 30 farmer respondents. Statistical analyses included partial difference tests (t-tests), significance tests (F-tests), and coefficients of determination (R^2), which were processed using SPSS. The findings indicate that farmer groups play a crucial role in enhancing the productivity of oil palm farmers.

Keywords: Agricultural Product Marketing, Farm Business Efficiency, Farmer Groups, Farmer Productivity, Oil Palm, Productivity, Tebing Linggahara Baru Village

1. Introduction

Palm oil is one of Indonesia's leading export commodities and plays a central role in the country's agricultural sector (Situngkir, 2022). As the world's largest palm oil producer, Indonesia demonstrates high competitiveness in the global market (Nurkhoiry, 2017). Beyond serving as a source of foreign exchange and tax revenue, palm oil significantly contributes to economic growth, provides industrial raw materials, and generates employment opportunities (Ismail Nare et al., 2018). The development of oil palm plantations is therefore integral to national plantation development strategies (Arsyad & Maryam, 2017).

North Sumatra is one of the country's key palm oil–producing provinces, ranking third after Riau and Central Kalimantan. According to the Central Statistics Agency (BPS, 2023), smallholder oil palm plantations in North Sumatra covered 1,379,442 hectares in 2022, producing 22,254,429.26 tons (BPS, 2023).

Oil palm plantations play a crucial role in enhancing people's welfare, providing employment opportunities, and contributing to the regional economy. Palm oil is a crucial and strategic commodity in Labuhanbatu Regency due to its significant role in driving the local economy. Oil palm is a favorite crop for rural communities in Labuhanbatu. This point is quite reasonable because the Labuhanbatu district is indeed suitable and has the potential for plantation agricultural development. According to BPS (2023), Labuhanbatu at the district level has emerged as a leading production center, with 55,850 hectares under cultivation.

Labuhanbatu Regency is the largest palm oil-producing region, particularly in North Sumatra Province. Tebing Linggahara Baru Village is located in Labuhanbatu Regency, North Sumatra. The community earns a living by farming oil palms. The impact of oil palm plantations can increase farmers' incomes and contribute to local revenue (SIRADJUDDIN, 2015). This way can be implemented in groups, particularly among farmer groups focused on oil palm.

To achieve high levels of income and profit in oil palm farming, it is necessary to focus on increasing production volume and the quality of fruit. The development of

*Correspondence: auliafakhrezi@gmail.com
1) Universitas Labuhanbatu - Jl Sisingamangaraja No. 126-A, KM. 3,5, Aek Tapa, Rantauprapat, Kabupaten Labuhanbatu, Sumatera Utara 21415, Indonesia

smallholder oil palm farming also plays a crucial role in the socio-economic life of rural communities (Abdina, 2019). For this reason, a group is needed that can serve as a forum for farmers to help increase the production volume and quality of the oil palm fruit itself. The primary function of farmer groups is basically as a vehicle: the process of teaching and learning, collaboration, production, and business (Pratama et al., 2016)

Farmer Groups are a place where several farmers/breeders/and planters can gather to learn, work together, and form a production unit based on shared domicile and agricultural land (PERMENTAN, 2013). The formation of farmer groups is an agricultural development effort that facilitates agricultural production (Hatibi et al., 2023). Farmer groups are used as a means to organize and develop farmers (Faqih, 2015).

Farming activity can be indicated by an increase in harvest yields and increased income and profits for farmers themselves, thereby creating prosperity, especially for their families. The formation of farmer groups can increase potential and provide a means to minimize problems, thereby creating effective conditions, particularly in obtaining information on capital, market access, and resources (Cristopher et al., 2024).

To date, Tebing Linggahara Baru Village has a farmer group with 167 members. The existence of this farmer group not only serves as a forum for farmers to share knowledge and experience, but also as a key factor in developing a more organized and productive oil palm plantation business in this village. With a strong spirit of togetherness, the farmer group in Tebing Linggahara Baru Village continues to strive to improve the welfare of its members through various targeted and measurable programs.

Joining farmers in farmer groups also provides various other benefits, such as easier access to the latest information, broader markets, innovative agricultural technology, necessary capital, and other relevant resources to support the development of farming businesses. This finding aligns with the 2013 Minister of Agriculture Regulation (Permentan), which emphasizes that the primary objective of establishing farmer groups is to enhance and develop the capabilities of farmers and their families through a group-based approach. Thus, farmers can play a more active and significant role in supporting the development of the agricultural sector. The importance of this agricultural role should be balanced with the increased attention of all stakeholders in this field, including attention to agricultural actors as drivers of the agricultural sector (Nazaruddin, 2017).

Effective oil palm cultivation requires adherence to proper agronomic practices, as planting techniques directly influence plant health, productivity, and uniformity (Nugroho, 2019). Accordingly, the role of farmer groups must be reinforced to enhance farmers' knowledge, managerial capacity, and competitiveness in a globalized agricultural market (Hidayat, 2023). Previous studies on oil palm farmers in Labuhanbatu have primarily focused on technical cultivation practices, fertilizer application, land productivity, and FFB marketing chains, including farmers' access to financial institutions (Raniwati Siregar et al., 2023). However, this study differs in that it focuses on the institutional role of farmer groups in supporting income growth among oil palm farmers. It examines not only the technical and marketing aspects, but also the organizational function of farmer groups as platforms for learning, cooperation, and business development, collectively enhancing farmers' competitiveness and welfare.

Based on the description above, the author is interested in looking at the role of forming farmer groups in improving farmer welfare (farmer income) itself. Therefore, the author conducted a study titled "The Role of Farmer Groups in Supporting Increasing the Income of Oil Palm Farmers in Tebing Linggahara Baru Village." This study aims to analyze the role of farmer groups in supporting the increased income of oil palm farmers.

2. Material and Methods

This research was conducted in Tebing Linggahara Baru Village, Bilah Barat District, Labuhanbatu Regency, North Sumatra Province, which is geographically located at approximately 2.08°80" N and 99.90°40" E. This location was chosen due to the presence of an oil palm farmer group that is actively involved in learning classes, inter-farmer collaboration, and production units. The research took place from April to June 2025, encompassing instrument preparation, data collection through questionnaires and interviews, and data analysis.

The variables used in this study consist of independent variables (X), which include learning classes (X1), cooperation facilities (X2), and production units (X3), as well as dependent variables (Y), which are the income of oil palm farmers. The research population consists of all members of the oil palm farmer group in Tebing Linggahara Baru Village, while the research sample is determined purposively, comprising 30 respondents, including farmers and village officials who are members of the farmer group.

The research instruments consisted of questionnaires with a 1–5 Likert scale, interview guidelines, and supporting documentation. The research tools used include questionnaires, interview guidelines, stationery, and laptops or computers for data processing and analysis. The data used consists of primary data obtained through questionnaires and direct interviews with respondents, as well as secondary data obtained from official village documents, farmer group reports, and relevant literature.

Data analysis was conducted using descriptive statistics to describe the distribution of respondents' answers, as well as inferential statistics in the form of

classical assumption tests, multiple linear regression, t-tests, F-tests, and coefficients of determination (R^2) to determine the extent to which independent variables influence the dependent variable. In addition, descriptive qualitative analysis was also used by collecting, classifying, and interpreting information obtained from respondents and related documents.

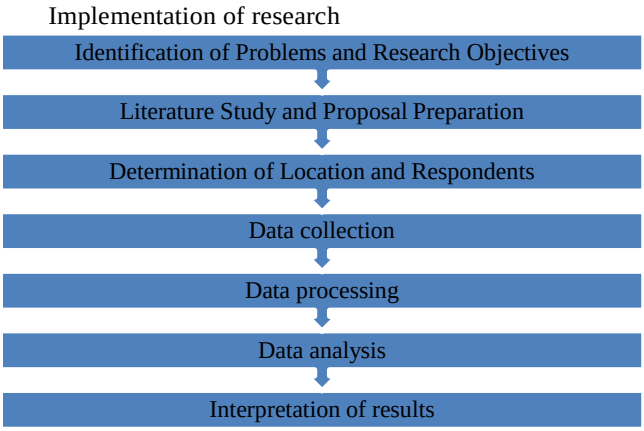

Figure 1. Research flow diagram

3. Results and Discussion

3.1. Results

Based on observations in Tebing Linggahara Baru Village, Bilah Barat District, Labuhanbatu Regency, there are 30 oil palm farmers, 20 of whom are classified as productive and effectively manage their plantations, resulting in more sustainable harvests. The average age of the farmers' oil palm plants is around 8 years, with most having entered the production phase (TM). Immature plants (TBM) generally have a height of 1–3 m at the age of 6 months after transplanting, while productive plants reach 3–8 m at the age of 5–6 years with an average production of 1.5 tons per hectare. Farmers generally fertilize 2–3 times a year using inorganic fertilizers such as Urea, KCl, TSP, NPK, and Dolomite, some of which are combined with organic fertilizers. The types of seeds that are widely used are superior seeds, such as Marihat, Topaz, and Socfindo, from both PPKS and independent seed companies. The plantation area in this area is dominated by flat, undulating topography with an elevation of approximately 50 meters above sea level, making it highly suitable for oil palm cultivation. The TBM (Treated Palm Oil) plants have not yet produced any oil (0 tons/ha), while mature plants can produce an average of 1.5 tons per hectare, indicating that the oil palm plantations in this area are in a productive phase with potential for increased yields through more optimal management.

Table 1. Characterization table of farmers and oil palm plantations in Tebing Linggahara Baru Village, Bilah Barat District, Labuhanbatu Regency.

Parameter	Results	Information
Number of Productive Farmers	20 people	Active farmers who can manage their gardens well, with high and sustainable production.
Average age of farmers' oil palm plants	8 years	Most are in the producing phase (TM)
Average height of immature plants (TBM)	1–3 m	6 months after transplanting
Average height of productive plants (TBM)	3–8 m	Age 5–6 years of production plants
Average crop production	1.5 tons/Ha	The productivity of productive farmers is higher than that of less productive farmers.
Overview of the amount of fertilization per year	2–3 times	Adapted to the season and land conditions
Type of fertilizer given.	Urea, KCl, TSP, NPK, Dolomite	Inorganic fertilizers are the dominant type, and some also incorporate organic fertilizers.
Average types of seeds planted by farmers	Marihat, Topaz, Socfindo	Superior seeds from PPKS and several independent seeds
Land topography in Tebing Linggahara Baru Village, Bilah Barat District, Labuhanbatu Regency	Flat, undulating, 50 meters above sea level	Suitable for oil palm cultivation
Average production of immature plants (TBM)	0 tons/ha	Not yet in production, age < 4 years
Average crop yield (TM)	1.5 tons/Ha	Optimal production in plants aged 5–6 years

3.1.1. Instrument Test

3.1.1.1. Validity Test

Table 2 reports that ri> rtable, so the distributed questionnaire is stated to be in accordance with the reality in the field. Based on Table 1, the instrument is considered valid because its reliability interpretation is 0.60.

Based on the table, it can be seen that all statement items in the variables of Learning Class (X1), Cooperation Vehicle (X2), Production Unit (X3), and Income (Y) have a calculated r-value greater than the r-table (0.361). Thus, it can be concluded that all questionnaire instruments used in this study are declared valid and can be continued to the next stage of analysis.

Figure 2. A plant that has not yet produced fruit

Figure 3. A Fruit-Producing Plant

Table 2. Results of Research Instrument Validity Testing

Variables	Statement	r count	r table	Information
Study class (X1)	1	0.734	0.361	Data received
	2	0.689	0.361	Data received
Cooperation vehicle (X2)	1	0.701	0.361	Data received
	2	0.672	0.361	Data received
	3	0.745		
Production Unit (X3)	1	0.692	0.361	Data received
	2	0.668	0.361	Data received
	3	0.709		
Income (Y)	1	0.654	0.361	Data received
	2	0.711	0.361	Data received

3.1.1.2. Reliability Test

A construct or variable is considered reliable if it yields a Cronbach's Alpha value greater than 0.60. The results of the reliability test in this study are as follows.

Table 3 shows that the Cronbach's Alpha value for each variable is greater than 0.60. This result means that all research instruments, including the learning class, collaboration vehicle, production unit, and income variables, have met reliability requirements. Therefore, the questionnaire instrument used can be considered consistent and suitable for further research.

Table 3. Results of Reliability Testing of Research Instruments

Variables	Cronbach's Alpha	N Of Items	Information
Study class (X1)	0.754	2	Reliable
Cooperation vehicle (X2)	0.702	3	Reliable
Production Unit (X3)	0.801	3	Reliable
Income (Y)	0.793	2	Reliable

3.1.1.3. Results of the Classical Assumption Test and Data Normality

The results of the classical assumption test and normality of the research data are presented in Figure 4.

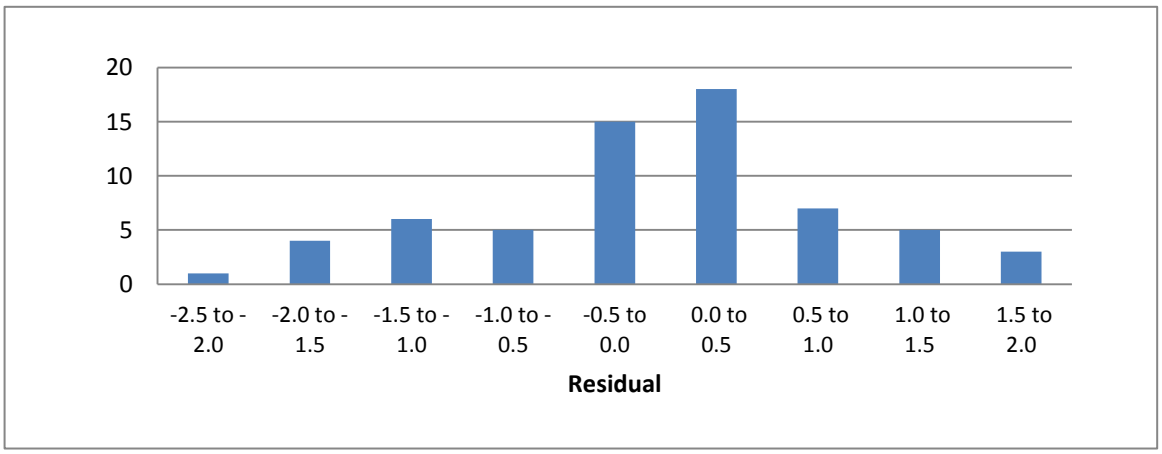

Figure 4. Histogram of Normality Test. Source: Research Results

Based on Figure 4, it can be seen that the graph forms a curve that approximates a bell shape, with most of the data concentrated in the center and tapering off towards the right and left. This distribution pattern indicates that the residual data tends to be normally distributed. Thus, it can be concluded that the regression model meets the normality assumption, allowing the analysis to proceed to the next stage.

3.1.2. ANOVA Test Results

The results of the analysis of variance (ANOVA) are presented in Table 4. Based on the results of the ANOVA test, a significance value of 0.000 (<0.05) was obtained. This finding indicates that the independent variables, including the role of farmer groups (X1), farmer participation (X2), and institutional support (X3), have a significant simultaneous effect on the income of oil palm farmers (Y). This summary means that the higher the role of farmer groups and farmer participation, and the stronger the institutional support, the greater the contribution to increasing farmer income.

These results align with findings (Pinem, 2021), which explain that farmer characteristics, such as land area, experience, and age, significantly influence the income of oil palm farmers in Lau Mulgab Village, Langkat Regency. Therefore, farmer groups serve not only as organizational platforms but also as an effective means of optimizing farmers' potential and supporting their economic well-being.

Table 4. ANOVA results

Source of Variation	Sum of Squares (SQ)	df	Mean Square (RMS)	F Count	Sig. (p-value)
Intergroup	2,156	2	1,078	3.92	0.032*
In Group	7,689	27	0.285		
Total	9,845	29			

3.1.3. Results of Multiple Linear Regression Analysis

The influence of the variables of learning class, cooperation, and production units on increasing farmer group income, as independent variables, can be seen from the multiple linear analysis presented in Table 5.

A negative constant value indicates that if the variables of learning class, cooperation vehicle, and production unit have a value of zero, then farmer income (Y) has a negative value. In practice, this does not happen, but the constant only indicates the starting point of the regression equation.

Study Class (X1 = 0.4427, Sig. = 0.0028 < 0.05)

The regression coefficient of 0.4427 indicates that a 1-unit increase in learning class will result in a 0.4427-unit increase in farmer income, assuming all other variables remain constant. Since the significance value is <0.05, the learning class variable has a positive and significant effect on farmer income.

Collaboration Vehicle (X2 = 0.7611, Sig. = 0.0000 < 0.05)

The regression coefficient of 0.7611 means that every 1-unit increase in the cooperation vehicle will increase farmer income by 0.7611 units, assuming other variables remain constant. Since the significance value is <0.05, the cooperation vehicle variable has a positive and significant effect on farmer income.

Production Unit (X3 = 0.0575, Sig. = 0.7566 > 0.05)

The regression coefficient of 0.0575 indicates a positive, albeit non-significant, influence. Thus, production units do not have a significant impact on farmers' income.

Table 5. Results of Multiple Linear Regression Analysis (Coefficients)

Model	Unstandardized Coeff. (B)	Std. Error	t	Sig.	95% Confidence Interval (B)
(Constant)	-1.0418	0.2694	-3,867	0.0007	-1.5955 to -0.4880
Study Class (X1)	0.4427	0.1338	3,308	0.0028	0.1676 to 0.7178
Cooperation Vehicle (X2)	0.7611	0.1218	6,247	0.0000	0.5107 to 1.0115
Production Unit (X3)	0.0575	0.1836	0.313	0.7566	-0.3199 to 0.4349

Constant (a = -1.0418)

3.1.4. Partial Significance Test (t-Test)

The results of the partial significance test on the learning class, learning facilities, and production unit factors in increasing the income of oil palm farmers are presented in Table 6.

Class (X1)

a. The calculated t-value = 3.221 is greater than the t-table (±2.048, α=0.05, df=32)

b. The significance value is 0.0028 < 0.05. This finding indicates that the learning class has a positive and significant impact on farmers' income.

Cooperation Vehicle (X2)

a. T-count value = 7.806 > t-table = 2.048

b. The significance value is 0.000 < 0.05. This result means that the cooperation vehicle has a positive and significant effect on farmers' income.

Production Unit (X3)

a. T-count value = 0.313 < t-table = 2.048

b. The significance value is 0.7566, which is greater than 0.05. This result indicates that the production unit has no significant impact on farmer income.

Table 6. Partial Test Results (t-Test) (Coefficients)

Variables	Coefficient (B)	t-count	Sig.	Information
Constant	-1.0418	-0.850	0.401	Not significant
Study Class (X1)	0.4427	3,221	0.0028	Significant (influential)
Cooperation Vehicle (X2)	0.7611	7,806	0.0000	Significant (influential)
Production Unit (X3)	0.0575	0.313	0.7566	Not significant

3.1.5. Simultaneous Significance Test (F Test)

The results of the significance test of the cooperation factors, learning class, and production unit on the income of oil palm farmers are presented in Table 7.

F -count = 33.56

Compared with the F-table ($\alpha = 0.05$, df1 = 3, df2 = 30) ≈ 2.92, it can be seen that:

33.56 > 2.92, then the regression model is significant.

Significance value (p-value) = 0.000 < 0.05

It shows that, simultaneously, the independent variables (study classes, collaboration facilities, and production units) have a significant influence on the income of oil palm farmers.

These findings align with research conducted by Wati et al. (2020), which found that empowerment programs through smallholder oil palm farmer groups had a positive and significant socio-economic impact on improving farmer welfare in Bangka Regency. Therefore, these research findings strengthen empirical evidence that farmer groups play a crucial role in supporting increased incomes for oil palm farmers.

Table 7. Simultaneous Test Results (F Test)

Source of Variation	JK (Sum of Squares)	df	MS (Mean Square)	F-count	Sig.
Regression	11,823	3	3,941	33.56	0.0000
Residual (Error)	3,527	30	0.118		
Total	15,350	33			

3.1.6. Coefficient of Determination

The results of the coefficient of determination for the research on cooperation factors, learning classes, and production units in influencing the income of oil palm farmers are presented in Table 8.

Table 8 reports that the coefficient of determination (R-squared) is 0.773, or 77.3%. This result indicates that the dependent variable, namely farmer income, is influenced by the main factors, including learning classes, production units, and collaboration facilities, to the extent of 77.3%. Meanwhile, the remaining 22.7% is influenced by other factors outside this research model, such as the price of fresh fruit bunches (FFB), fertilizer costs, farming experience, and other external factors not included in the regression model.

Table 8. Coefficient of Determination (Model Summary[b])

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	0.879	0.773	0.754	0.343

3.2. Discussion

3.2.1. The Influence of Learning Classes on Farmers' Income

The analysis shows that the learning class variable (X1) has a significant effect on farmers' income, as indicated by the calculated t-value (3.63) exceeding the critical t-table value (1.687). This finding confirms that participation in learning classes contributes to income improvement among oil palm farmers in Tebing Linggahara Baru Village. The result aligns with the notion that active involvement in farmer education enhances knowledge and technical skills, which in turn support higher productivity and income levels. The more frequently farmers engage in structured learning activities, the greater their capacity to adopt improved farming practices and managerial strategies.

3.2.2. The Impact of Cooperation Vehicles on Farmers' Income

The cooperation vehicle variable (X2) also demonstrated a significant influence, with a calculated t-value (3.14) greater than the t-table value (1.687). This result suggests that cooperation, both within farmer groups and with external stakeholders, has a positive impact on farmer income. Collaborative arrangements—such as joint marketing, collective input procurement, and knowledge exchange—strengthen farmers' bargaining power while reducing transaction and production costs. These findings are consistent with previous studies, which emphasize that farmer cooperation enhances economic efficiency and creates better access to markets, thereby improving income sustainability.

3.2.3. The Influence of Production Units on Farmers' Income

Similarly, the production unit variable (X3) yielded a calculated t-value (2.94), which is higher than the t-table value (1.687), indicating a significant relationship with farmer income. This result highlights the importance of

well-organized and adequately equipped production facilities in increasing farm output. Access to shared production units allows farmers to optimize land use, improve harvest quality, and achieve economies of scale. As a result, productivity gains translate directly into higher incomes for farmer group members.

3.2.4. The Influence of Learning Classes, Collaborative Facilities, and Production Units on Farmers' Income

The simultaneous test further reinforces these results, with the calculated F-value (29.06) exceeding the F-table value (2.76). This result suggests that learning classes, cooperative vehicles, and production units collectively have a significant impact on farmers' income. Importantly, these findings suggest that improvements in farmer income are not driven by any single factor in isolation, but rather by the synergistic interaction among knowledge acquisition, collaborative practices, and access to production resources. Strengthening these three dimensions simultaneously can therefore generate greater and more sustainable improvements in farmers' livelihoods.

4. Conclusion

In conclusion, the study demonstrates that farmer groups play a pivotal role in improving the productivity of oil palm farmers. The functions of farmer groups—as learning classes, cooperation vehicles, and production units—were all found to have a significant positive influence. Collectively, these factors explain 74.9% of the variation in farmer productivity, while the remaining variation is attributable to external factors beyond the scope of this study. These findings underscore the importance of strengthening farmer group institutions as a strategy to enhance smallholder oil palm productivity and, consequently, improve farmer welfare.

References

Abdina, M. F. (2019). Analisis dampak perkebunan kelapa sawit terhadap sosial dan ekonomi masyarakat di Kabupaten Asahan. *Journal of Education, Humanities, and Social Sciences (JEHSS)*, 2(2), 286–306. https://doi.org/10.34007/jehss.v2i2.109

Arsyad, I., & Maryam, S. (2017). Analisis faktor-faktor yang mempengaruhi produksi kelapa sawit pada kelompok tani sawit mandiri. *Jurnal Ekonomi Pertanian dan Pembangunan*, 14(1), 75–85.

Badan Pusat Statistik. (2023). *Statistik perkebunan kelapa sawit*. Badan Pusat Statistik Provinsi Sumatera Utara.

Cristopher, S., Rizal, K., Hartati, S., & Triyanto, Y. (2024). The role of farmers' groups in supporting increasing the income. *Jurnal Sosial Ekonomi Pertanian*, 26(1), 5085–5092.

Faqih, A. (2015). Persepsi anggota kelompok tani terhadap peranan kelompok tani di Kecamatan Suranenggala Kabupaten Cirebon Provinsi Jawa Barat. *Jurnal Ilmiah Lemlit Unswagati Cirebon*, 15(3), 1–18.

Hatibi, I., Yatim, H., & Zaenuddin, R. A. (2023). Peranan kelompok tani terhadap pendapatan usahatani padi sawah (*Oryza sativa* L.). *Jurnal Ilmiah Mahasiswa Fakultas Pertanian (JIMFP)*, 3(2), 315–321.

Hidayat, A. (2023). Diversifikasi usaha tani dalam meningkatkan pendapatan petani dan ketahanan pangan lokal. *Jurnal Pertanian Berkelanjutan*, 5(1), 1–11.

Ismail Nare, T., Noor, M., & Kalla Linggi, R. (2018). Dampak industri kelapa sawit. *Jurnal Ilmu Pemerintah*, 6(4), 1337–1348.

Nazaruddin, A. O. (2017). Pengaruh penguatan kelompok tani terhadap partisipasi dan motivasi pemuda tani pada usaha pertanian di Leuwiliang, Bogor. *Jurnal Agribisnis Terpadu*, 10(2), 1–14.

Nugroho, A. (2019). *Teknologi agroindustri kelapa sawit*. Lambung Mangkurat University Press.

Nurkhoiry, R. (2017). Daya saing ekspor minyak kelapa sawit Indonesia. *Jurnal Penelitian Kelapa Sawit*, 25(2), 105–116.

Peraturan Menteri Pertanian Republik Indonesia. (2013). *Pedoman pembinaan kelompok tani dan gabungan kelompok tani*.

Pinem, L. J. (2021). Agriprimatech sawit. *Agriprimatech*, 5(1), 1–8.

Pratama, B. P., Sayamar, E., & Tety, E. (2016). Peran kelompok tani dalam meningkatkan pendapatan petani swadaya kelapa sawit di Desa Bukit Lingkar Kecamatan Batang Cenaku Kabupaten Indragiri Hulu. *Jurnal Agribisnis*, 3(2), 1–12.

Raniwati Siregar, Nawawi, Z. M., & Syafina, L. (2023). Pengaruh distribusi pupuk, biaya produksi kelapa sawit dan subsidi pupuk terhadap pendapatan petani di Desa Sei Siarti Kabupaten Labuhanbatu. *ADL Islamic Economic: Jurnal Kajian Ekonomi Islam*, 4(1), 33–44. https://doi.org/10.56644/adl.v4i1.58

Siradjuddin, I. (2015). Dampak perkebunan kelapa sawit terhadap perekonomian wilayah di Kabupaten Rokan Hulu. *Jurnal Agroteknologi*, 5(2), 7–15. https://doi.org/10.24014/ja.v5i2.1349

Situngkir, D. I. (2022). Daya saing minyak kelapa sawit Indonesia di pasar global. *Jurnal Agrotristek*, 1(1), 7–11.

Wati, S. S., Agustina, F., & Evahelda, E. (2020). Dampak sosial ekonomi program pemberdayaan petani kebun kelapa sawit rakyat di Kabupaten Bangka. *Journal of Integrated Agribusiness*, 2(1), 1–19. https://doi.org/10.33019/jia.v2i1.1121