



ARE SMALLHOLDER PALM OIL FARMERS STILL PROSPEROUS?

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Abstract

The agricultural sector plays a crucial role in supporting livelihoods, improving farmers' welfare, contributing to economic development and growth, and ensuring food security and product competitiveness. Riau Province has designated oil palm as its superior commodity to boost economic growth and enhance the welfare of both farmers and the general public. Initially, oil palm cultivation was primarily undertaken in dryland areas, which were considered more efficient in terms of input costs and output factors. Throughout its development, the oil palm industry continued to expand, supplying raw materials for downstream industries and becoming a commodity that serves as an economic stabiliser, offering a higher level of prosperity than other commodity crops. Consequently, as available dry land became fully utilised, the expansion of oil palm cultivation shifted towards wetlands (swampland). The objective of this study is to calculate and compare the farmer exchange rate (NTP) for independent smallholder oil palm plantations across both land topologies (upland and wetland). The results are then compared with the general agricultural NTP and sectoral NTP.

The method employed to determine the NTP for independent smallholder oil palm farmers involves calculating the ratio of the price index received by farmers (It) to the price index paid by farmers (Ib). The difference between it and IB is that it is one of the most recognised and widely used macroeconomic indicators for agricultural development in Indonesia. The data utilised includes primary data obtained from direct interviews with farmers and secondary data from various sources. The study's findings indicate that farmers on dryland (upland) topologies have higher land productivity, income, and NTP than those on wetland topologies. Overall, the welfare of oil palm farmers in upland areas is better than that of those in wetland areas, primarily due to the high input costs and low output prices experienced by wetland farmers.

Keywords: Palm oil, land topology, farmer exchange rate (NTP), welfare

INTRODUCTION

Agricultural development, particularly in the plantation sub-sector, fosters economic growth and decent employment for all, ensuring that decent jobs are available and accessible to all members of society who need them, or to the entire working population without exception (Syahza et al., 2020), thereby promoting prosperity. The availability of oil palm plantation land, labour, and access to financial institutions is an important asset for economic and human resource development. The more jobs there are, and the more people find work, the more income they will earn to achieve a certain level of welfare that they desire (Bakce & Mustofa, 2021)—considering that the distribution of oil palm plantations, especially smallholder oil palm plantations, is spread across four types of land, which can be divided into two types of terrain, namely dry land and wet land. Dry land used for agricultural businesses with limited water use, or "upland," refers to "higher areas" and is generally located between 0 and 700 meters above sea level. Meanwhile, wetlands are located in swamps, brackish areas, peatlands, or other natural or artificial water bodies with flowing or stagnant fresh, brackish, or saline water, including sea areas where the water level at low tide is no more than 6 meters (Suwanda et al., 2017). The use of wetlands as plantations is an alternative for the community

due to limited land availability and the high cost of dry land (Mustofa et al., 2025), even though it requires additional inputs in the production process.

The third Sustainable Development Goal, Good Health and Well-being, aims to ensure healthy lives and promote well-being for all at all ages, regardless of gender, educational level, or employment background. Health services encompass improving maternal and child health, preventing communicable and non-communicable diseases, promoting mental health, and ensuring universal access to quality and affordable health services for all. Meanwhile, prosperity aims to alleviate and end poverty and hunger through economic and social prosperity. Community prosperity, from an economic perspective, is a state of fulfilment of basic needs, as reflected in adequate housing, sufficient clothing and food, education, and health. Furthermore, it is said that community welfare is a state in which a person can maximise their utility within a given budget, while their physical and spiritual needs are met. A prosperous life is the dream and hope of people everywhere as they pursue their life goals. A prosperous life is a condition in which a person is healthy, peaceful, and prosperous wherever they live. Improving farmers' welfare is a key vision and mission of agricultural development, aimed at achieving food self-sufficiency and enhancing farmers' well-being. The level of farmer welfare can be measured by the Farmer Exchange Rate (NTP) and the Agricultural Business Exchange Rate (NTUP). The Farmer Exchange Rate in Indonesia in 2021 was 107.93, using 2018 as the base year. The NTP in 2022 was 120.67, and in 2023, it was 111.49. In general, the welfare of farmers in Indonesia has declined over the last three years.

Riau is one of the provinces rich in natural and human resources (HR), thus playing a crucial role in development by utilising these resources and the environment to sustain social, economic, and environmental welfare (Mustofa et al., 2025). As a region rich in natural resources, development policies focus on land-based agricultural development in strategic areas of the province, which can drive economic growth in the region and its surrounding areas, with a multiplier effect on welfare. One of the most promising natural resources in Riau Province, as a fundamental centre of the plantation sector, is oil palm, which is the most extensive in Indonesia and produces vegetable oil, cosmetics, food, industrial raw materials, and biodiesel fuel (Pahan, 2012). Optimal utilisation of natural resources is certainly in line with government policies related to the welfare of the population, especially the welfare of farmers and planters, in an effort to improve the quality of life of the community (Wicaksono et al., 2018) and increase the income of planters through the efficient use of production factors (Bakce, 2016).

Although Riau has the largest area of oil palm plantations in Indonesia, farmers face challenges due to the diverse geographical conditions and land types, ranging from dry to wet areas. The next challenge is that agricultural development policies have not been felt equally by all farmers, especially oil palm farmers, as agricultural development remains focused on achieving food self-sufficiency without regard for improving farmers' welfare. Meanwhile, farmers hope that food self-sufficiency will be followed by improved welfare, including increased income, access to health care, education,

employment, consumption, housing, and socio-cultural aspects, as well as legal certainty in land control and ownership (BPS Riau Province, 2025). Currently, not all farmers have access to markets, information, or government support. To improve adequate knowledge of collective production and marketing management issues so that cost efficiency is achieved to reach optimal income and welfare, it is hoped that farmers will be able to develop themselves and carry out their social functions to achieve cost efficiency and increase the bargaining position of farmers in the agricultural business system (Syahza, 2011).

The challenges posed by geographical conditions and uneven agricultural development policies across the community have the potential to reduce productivity and farmer/plant income, leading to high production costs that, in turn, reduce the welfare of oil palm farmers/planters. This study aims to determine the welfare level of smallholder oil palm farmers in Indragiri Hilir Regency, focusing on land productivity, production costs, and farmer income, using the self-reliance model. The study is based on land typology, which illustrates the sustainability of smallholder oil palm farming.

LITERATURE REVIEW

Palm Oil

The palm oil (*Elaeis guineensis*) is a plant designed as a crop that produces derivative products for downstream industry needs derived from Crude Palm Oil (CPO) and Palm Oil Kernel (PKO) for vegetable oil industry materials, processed food industry materials, cosmetics, and biodiesel fuel (Faizal et al., 2018). The community prefers oil palm as a leading commodity compared to other crops, as it has a multiplier effect of 2.44, which is significantly higher than that of other crops (Syahza & Nasrul, 2013).

Almost the entire Riau Province is suitable for palm oil cultivation, as this plant can grow on both dry and wet land (Mustofa, 2017). Wet land is an alternative to dry land, which is very limited and has been cultivated earlier by corporations and smallholder palm oil plantations (Pahan, 2015). Palm oil plants can grow on various types of land, including mineral and peat soils, including inland, tidal, and coastal peat. Land type is a crucial factor in determining the suitability of land for plantations, encompassing soil conditions, topography, climate, drainage, water availability, and infrastructure accessibility.

Land

Land as a planting medium is an area on the earth's surface that encompasses all components of the biosphere that support human life (Ritohardoyo & Sadali, 2017) and other living things in their life cycles (Muta' Ali et al., 2012). Land plays a crucial role as an input in the farming process, with land quality and characteristics varying according to the type of crop expected for GAP implementation by farmers (Ratmini, 2012). Land has many functions, namely: (1) production

function; (2) biotic environmental function; (3) climate control function; (4) hydrological function; (5) storage function; (6) waste and pollution control function; (7) living space function; (8) heritage and storage function; (9) spatial connection function (Mishra et al., 2020). Land is divided into two main parts: dry land, used for agricultural activities with limited water use, and wet land, also known as lowland, which has sufficient water availability (Mustofa, 2017).

Economically, land exhibits varying levels of productivity between different agroecosystems or is location-specific (Bareille et al., 2020). The land area determines the scale of the business, the organisation of work, the use of technology, the utilisation of production factors, and the permits required for oil palm farming (Pahan, 2012). The larger the area of land used in plantation farming, the greater the impact on techniques for land clearing, planting, maintenance, harvesting, transportation, and even marketing systems and output prices (Evizal, 2014). Therefore, land area plays a crucial role in determining output prices, which in turn contribute to farmers' income and welfare (Syahza et al., 2020).

Dry land can be utilised permanently or seasonally, with water sources such as rainfall or irrigation water. Dry land typology ranges from lowlands (0-700 m above sea level) to highlands (> 700 m above sea level) (Reibelt et al., 2019). Wetlands are swamps, brackish areas, peatlands, or other natural or artificial bodies of water that are flowing or stagnant, fresh, brackish, or saline, including sea areas where the water level at low tide is no more than six meters. Land typology significantly influences production factors, including labour, capital, and management. The suitability class of dry land in Riau Province generally falls into the S2 land suitability category, with a potential productivity of 20-26 tons of fresh fruit bunches (FFB)/ha/year. Meanwhile, the suitability of wetland land, especially peatland, generally falls into the S3 category, depending on soil characteristics, including peat maturity, peat thickness, drainage or flooding, and the presence of a sulfidic or sandy substrate.

Welfare

Law of the Republic of Indonesia Number 13 of 1998 states that welfare is a way of life and social livelihood, encompassing both material and spiritual aspects, which include a sense of security, morality, and physical and spiritual peace, enabling every citizen to fulfil their physical and spiritual needs. Welfare encompasses social aspects for oneself, one's family, and society by upholding human rights and obligations in accordance with the principles of Pancasila. Every citizen works and engages in agriculture and the palm oil plantation sub-sector to earn an efficient income using available resources (Maulida, 2021). The work and businesses carried out are based on a body of knowledge, a body of skills, and a set of values, utilising resources owned by oneself or obtained through others to achieve predetermined goals (Sparta & Handini, 2015), namely to generate profits and fulfil needs.

The long-term welfare of independent palm oil farmers is inextricably linked to compliance with sustainability standards. The Indonesian Sustainable Palm Oil (ISPO) and the Roundtable on

Sustainable Palm Oil (RSPO) standards establish criteria that encompass economic, social, and environmental aspects. Farmer welfare encompasses farmers' ability to participate in fair partnership schemes and to obtain reasonable selling prices in accordance with government-set prices (Mustofa & Bakce, 2024). In reality, the price of fresh fruit bunches (FFB) received by farmers remains significantly below the government-set price, negatively impacting farmers' income and welfare (Syahza et al., 2020). The ISPO certification requirement is one of the readiness gaps between farmers who are not partnered and those who are. For farmers, compliance with ISPO is currently seen as an additional burden (Apriyanto et al., 2021). One reason for the slowness of ISPO certification is the lack of legal certainty regarding land ownership and the absence of incentives for farmers to improve their welfare.

Income

The objective of oil palm plantation farming is to generate income and profits. Income is the difference between total revenue and total costs (Pahan, 2008, 2015). Farming income is influenced by productivity, namely the amount of fresh fruit bunch (FFB) production, the price of FFB, and production costs. Productivity is influenced by factors such as land area, fruit quality, plantation location, and supporting facilities and infrastructure. The production process requires careful cost allocation to ensure costs are efficient and contribute to increased profits, thereby achieving economic prosperity (Mustofa et al., 2022). FFB prices are not subject to perfect market competition. The pricing of palm oil FFBS in the international market is influenced by several factors, including supply and demand (Mustofa & Bakce, 2024) and substitute and complementary goods (Harefa et al., 2022).

Geographical conditions lengthen the marketing chain, resulting in lower fruit quality. Scattered plantation locations and damaged roads increase transportation costs, thereby increasing production costs (Saeri, 2018). The length of the marketing chain makes farming suboptimal, i.e., it is neither practical nor efficient. Effectiveness refers to a systematic implementation process, appropriate targets, and the achievement of planned objectives. Meanwhile, efficiency refers to the effective use of available resources, including human, natural, working capital, and land resources (Saeri, 2018). Failure by farmers to achieve optimal conditions will result in reduced income and welfare. Farmers' welfare is measured by the Farmer Exchange Rate (NTP) and the Agricultural Business Exchange Rate (NTUP).

Farmers' Exchange Rate (NTP)

Farmers' Exchange Rate (NTP) is the ratio between the price index received by farmers (HT) and the price paid by farmers (HB), or the ratio between the price index received by farmers (It) and the price index paid by farmers (Ib), expressed as a percentage. This value describes the exchange rate or level of farmer welfare. If the NTP is greater than 100, it means that farmers have a surplus

income. If it is less than 100, it means farmers' income is insufficient to cover household and farming expenses (BPS Riau Province, 2025). The welfare level of agricultural households can be seen from various aspects, including the condition of the household's housing and settlement. Analysis of farmer welfare is based on household income and expenditure.

Farmers' household income comes from palm oil plantation business income after deducting costs, while household expenditure includes food and non-food items. Food expenditure is the proportion of income allocated to food, indicating that meeting basic needs remains the focus of family income. Meanwhile, non-food expenditures, which account for a larger share of total expenditures, indicate greater purchasing power to meet secondary and tertiary needs. Household expenditure patterns prioritise the fulfilment of basic food needs. Once basic needs are met, the remaining income can be allocated to education, health, and investment in farming (BPS Riau Province, 2024).

METHOD

Time and Place

This research was conducted from February to August 2025, and the study sites were all smallholder palm oil plantations in Riau Province. The sampling methods used were stratified sampling and incidental sampling. Stratified sampling was used because the population has heterogeneous characteristics or varies according to strata. Incidental sampling is generally used for populations encountered by chance that meet the requirements for data sources.

The selection of the research location took into account the results of research by the Palm Oil Research Center (PPKS) on the average potential productivity of TM based on the level of suitability and land typology: first class land suitability (S-1) = 27.07 tons of fresh fruit bunches (FFB)/ha, second class land suitability (S-2) = 24.98 tons of FFB/ha, and third class land suitability (S-3) = 22.96 tons of FFB/ha. In this study, productivity and NTP were calculated based on two land typologies, namely wet and dry land, in smallholder oil palm plantations, ignoring land unsuitability and spatial allocation.

Data Analysis

This study used a combined spatial analysis and NTP analysis. Spatial analysis was employed to examine the existing conditions of landforms, typologies, characteristics, phenomena, and distributions of smallholder oil palm plantations. NTP analysis is a descriptive mathematical analysis of NTP indicators to measure the welfare of farming households. Calculation of Farmer Exchange

$$\text{Rate (NTP)} = \text{NTP} = \frac{I_t}{I_b} \times 100$$

NTP = Farmer Exchange Rate

I_t = Price index received by farmers

I_b = Price index paid by farmers

- $NTP > 100$ means that farmers experience a surplus. The price of their production increases more than the price of their consumption. Farmers' income has increased more than their expenses; thus, their welfare is higher than it was previously.
- $NTP = 100$, which means that farmers are breaking even. The change in the price of their production equals the percentage change in the price of their consumption goods. The level of farmers' welfare remains unchanged.
- $NTP < 100$ means that farmers are experiencing a deficit. The increase in the price of their production goods is relatively smaller than that of their consumption goods. The welfare level of farmers in a specific period decreased compared to the previous period.
- Compiled based on data from producer-level (*farm gate*) price surveys to determine the income earned by farmers from selling fresh fruit bunches (FFB) and non-agricultural products.
- Compiled based on data from surveys of the prices of goods consumed by farmers (*households*) and goods used as inputs for agricultural and non-agricultural production costs.

RESULTS AND DISCUSSION

Overview of the Research Location

The province of Riau covers an area of 87,023.66 km², stretching from the slopes of the Bukit Barisan Mountain range to the Malacca Strait. Riau has a wet tropical climate, with average annual rainfall ranging from 2,000 to 3,000 millimetres and an average of 160 rainy days per year. The province of Riau consists of 10 districts and two cities, and borders North Sumatra, Jambi, West Sumatra, and the Riau Islands. Riau is rich in natural resources, particularly oil and gas, and is a centre of Malay culture, with numerous large rivers, including the Siak, Kampar, Rokan, Indragiri, and Kuantan Rivers. These large rivers are the backbone of the economy and a source of life for the agricultural and plantation sub-sectors.

Respondent Characteristics

Respondent characteristics were assessed based on gender, education, primary occupation, land area, land productivity, income, expenditure, and cultivation patterns. A total of 253 respondents were successfully identified and agreed to be interviewed across the entire Riau Province, representing both dryland and wetland typologies, comprising 231 men and 22 women. Many of the male respondents who were met and interviewed were gathered at their land locations. Male respondents were generally plantation workers, who are more attractive to male workers than female workers because they require more physical strength or energy, while female workers mainly assist them.

In terms of education level, 12 respondents had completed elementary school, 73 had completed junior high school, 48 had completed senior high school/vocational high school, and 94 had completed diploma/bachelor's degree programs. In terms of education, current oil palm farmers are better educated than previous generations, as farmers in the past were primarily tenant farmers rather than owner-farmers, resulting in a lower average level of education (Saeri, 2018). Furthermore, regarding the type of work, 206 respondents were owner-farmers and did not have other jobs. In contrast, the rest held various jobs, including those of farmers, farm workers, civil servants, entrepreneurs, private employees, and temporary employees, with 1, 21, 5, 2, 9, 2, and 7 individuals, respectively. The farm labour work carried out by respondents, other than as owners, is as harvesters and caretakers of other people's gardens, taking piecework and daily wages (Bakce, 2016).

Meanwhile, those who work as civil servants, contract workers, and private employees often pursue farming after securing a job and investing in the oil palm plantation sector. Furthermore, respondents who work as entrepreneurs are those who farm while also providing production facilities for farming households. In contrast, respondents with other occupations perform other non-skilled jobs to meet their livelihood needs (Sirajuddin, 2016).

Based on land typology, 154 respondents represent dry land and 99 respondents represent wet land. Respondents representing dry land were from the districts of Bengkalis, Indragiri Hilir, Indragiri Hulu, Kampar, Pelalawan, Rokan Hilir, Rokan Hulu, Siak, and Dumai City, with 8, 11, 18, 15, 3, 23, 17, 3, and 1 respondents, respectively. Meanwhile, respondents representing wetlands were from Bengkalis, Indragiri Hilir, Indragiri Hulu, Kampar, Pelalawan, Rokan Hilir, Rokan Hulu, and Siak districts, with 17, 17, 23, 20, 8, 37, 28, and 4 respondents, respectively. The large number of respondents representing the wetland typology was due to their presence at the interview location and their willingness to participate.

Productivity, Prices, and Farmers' Income

The respondents' land areas ranged from 1 ha to 9 ha, with averages of 4.12 ha in the dry land typology, 4.72 ha in the wet land typology, and 3.28 ha in the wetland typology. The ideal land area for each family to own for oil palm plantations is 4 ha/family (Syahza & Asmit, 2019), as the yield from 4 ha can meet primary and secondary needs, as well as support health and children's education up to the university level (Suwondo et al., 2021). Land ownership and education among farming households can reflect farmers' welfare, which, in turn, reflects the social strata and status of agrarian communities (Saeri, 2018). In terms of land productivity, the average yield of respondents was 13,662 kg/ha/year, with 13,911 kg/ha/year for dry land and 13,413 kg/ha/year for wet land. The lowest productivity was observed in dry land at 10,070 kg/ha/year, while the highest productivity was 17,236 kg/ha/year.

In contrast, the lowest productivity in wet land was 3,012 kg/ha/year, and the highest was 18,072 kg/ha/year. Low productivity in smallholder oil palm plantations suggests that the

management pattern or cultivation system has not been implemented correctly or in accordance with Good Agricultural Practices (GAP). To increase productivity, farmers must implement intensification or Smallholder Oil Palm Replanting (PSR) (Apriyanto et al., 2021), while also enhancing farmers' income through government-regulated partnership price management and improving governance.

Table 1.
 Comparison of Productivity, Fresh Fruit Bunch (FFB) Prices, and Respondent Income Year
 Productivity (kg/ha/year)

Yaer	Productivity (kg/ha/year)		FFB Price (Rp./kg)	
	Dry Land	Wet Land	Dry Land	Wet Land
2020	12.720	11.400	2.120	1.970
2021	14.628	14.250	2.310	2.090
2022	14.100	13.897	2.460	2.210
2023	13.966	13.510	2.575	2.415
2024	14.878	14.533	2.795	2.655
2025	13.171	12.890	2.705	2.635

The problems faced by farmers across land types are not limited to the amount of land they control, but also include productivity, farmer institutions, prices, income, access to financial institutions, and a lack of government guidance and attention. Low productivity is a fundamental problem due to the lack of crop maintenance and the irregular application of fertilisers as plant nutrients, which are applied based on resource availability (Pahan, 2015). Agronomically, 2020 saw the lowest productivity for both land types, at 12,720 kg/ha/year and 11,400 kg/ha/year, while the highest productivity was in 2024, at 14,878 kg/ha/year and 14,533 kg/ha/year. It shows that in wetlands, especially peatlands, good management can increase productivity to match or even exceed that of drylands. It occurs due to successful water management, subsidence control, and fire risk management (Adrianto et al., 2020).

The price of fresh fruit bunches (FFB) is influenced by movements in crude palm oil (CPO) and kernel prices on the international market. The price is determined by the weighted average of CPO and kernel prices, along with the K index value. The price gap between dryland and wetland farmers ranges from 4.96% to 8.87%, and the income gap between the two ranges from 4.67% to 16.72%. Farmer institutions play a crucial role in creating price stability and fairness for farmers, both plasma and independent, as well as avoiding significant price disparities between palm oil mills (PKS). This stipulation refers to the Minister of Agriculture Regulation (Permentan) No. 01/PERMENTAN/KB.120/1/2018, which aims to create fair and equitable prices for farmers and companies. The prices received by independent farmers differ from those set by the government, with an average price difference of between Rp. 500/kg and Rp. 1,000/kg. The most significant price

differences generally occur for independent farmers on wet land, a condition that can lead to price and income disparities, impacting the welfare of farming households.

Table 2. Comparison of Respondent Income Respondents

Year	Farming (IDRha/year/household)		Non-farming (IDR/year/household)		Total Income (IDR/year/household)		
	Dry Land	Wet Land	Dry Land	Wet Land	Dry Land	Wet Land	Total
2020	26.966.400	22.458.000	12.545.013	11.034.170	39.511.413	33.492.170	36.501.792
2021	33.790.680	29.782.500	12.178.996	15.234.550	45.969.676	45.017.050	45.493.363
2022	34.686.000	30.712.370	11.350.272	16.550.580	46.036.272	47.262.950	46.649.611
2023	35.962.450	32.626.650	15.250.340	15.110.195	51.212.790	47.736.845	49.474.818
2024	41.584.010	38.585.115	12.357.630	13.921.035	53.941.640	52.506.150	53.223.895
2025	35.627.555	33.965.150	16.711.552	15.989.845	52.339.107	49.954.995	51.147.051

Farming income is income derived from oil palm cultivation and is calculated as gross revenue per hectare multiplied by the average household land area. Non-agricultural income refers to income not directly related to agriculture but obtained from various activities outside agriculture, such as trade, services, or industrial sectors, or from other jobs, including farm labourers, traders, and other sources. Dry land consistently dominates agricultural income, driven by higher productivity and lower production costs compared to wet or peat land. The gap in net income between dry and wet land is substantial, necessitating distinct intervention strategies. Income from non-agricultural activities (income outside of oil palm plantations) serves as an economic shock absorber, contributing an average of 25–35% of total household income, especially for farmers on wet land who face greater agronomic risks and price volatility (Mustofa et al., 2025) compared to those on dry land.

Table 3.

Comparison of Income, Expenditure, and Farmer Exchange Rate (NTP) Based on Land Typology of Independent Smallholder Oil Palm Farmers in Riau Province

Year	Total Income (IDR/household/year)		Total Expenditure (IDR/household/year)		NTP	
	Dry Land	Wet Land	Dry Land	Wet Land	Dry Land	Wet Land
2020	39.511.413	33.492.170	38.607.986	33.140.877	102,34	101,06
2021	45.969.676	45.017.050	42.411.363	41.942.653	108,39	107,33
2022	46.036.272	47.262.950	36.331.996	40.715.843	126,71	116,08
2023	51.212.790	47.736.845	35.221.032	39.396.587	145,40	121,17
2024	53.941.640	52.506.150	36.503.783	41.460.952	147,77	126,64
2025	52.339.107	49.954.995	30.463.365	37.033.876	171,81	134,89

The results of the comparative analysis of income, expenditure, and farmer exchange rates (NTP) over six years (2020-2025) show a general increase, although fluctuations occur each year. Fluctuations can be seen in several aspects, namely income, expenditure, and NTP. The lowest farmer income was recorded in 2020 for the dry land typology at IDR 39,511,413/ha/year and for the wet land typology at IDR 33,492,170/ha/year. The leading cause of this joint cost shock was the global surge in non-subsidised fertiliser prices. Farmers found it very difficult to obtain limited access to subsidised fertiliser allocations and were highly dependent on the non-subsidised fertiliser market to meet their crop nutrition needs. As a result, farmers chose to use ash from empty fruit bunches as plant nutrients and to use whatever fertiliser was available. Farmers' highest income occurred in 2024, when the highest FFB price during the period of December 18-24, 2024, reached IDR 3,840.63/kg. The increase in FFB prices is often accompanied by high input prices, which threaten food security and farmers' welfare (Mustofa & Bakce, 2024).

The main expenses in oil palm farming are variable costs that vary widely depending on plant age, land area, and management methods. The most significant cost components are fertilisers, pesticides, and labour, especially wages for harvesting and plant maintenance. The lowest expenditure by farmers on dry land occurred in 2025 at Rp. 30,463,365/RT/year, and the lowest expenditure by farmers on wet land occurred in 2020 at Rp. 33,140,877/RT/year. Expenditures are influenced by land productivity, land distance, and the availability of access in the mobilisation of input and output factors. This comparison of expenditures shows that land is a dominant factor in determining productivity, production prices, farmer income, and welfare.

Table 4.

Comparison of Farmer Exchange Rates (NTP) Based on Land Typology and NTP for Agriculture and the Plantation Sub-Sector

Year	NTP for Dry Land	NTP for Wet Land	NTP for Agriculture	NTP for Sub-Sector
2020	102,34	101,06	97,69	96,05
2021	108,39	107,33	115,30	117,02
2022	126,71	116,08	132,16	139,82
2023	145,40	121,17	149,90	147,04
2024	147,77	126,64	148,31	159,24
2025	171,81	134,89	172,96	189,07

Riau Province is one of the key economic base areas, with plantation products serving as the mainstay of national economic development. Appropriate policy changes aim to harness the region's full potential, ultimately making it a hub of development and a driving force for the economy. Oil

palm plantations are an essential plantation commodity in Riau Province's economy, with the agricultural sector contributing 26.73% to the province's GRDP, and the plantation sector contributing the highest share to the GRDP from the agricultural sector at 65.22%. This condition implies a shift in welfare within the agricultural sector, but it remains more vulnerable to moderate increases in input costs. The shift in welfare is measured by comparing the NTP.

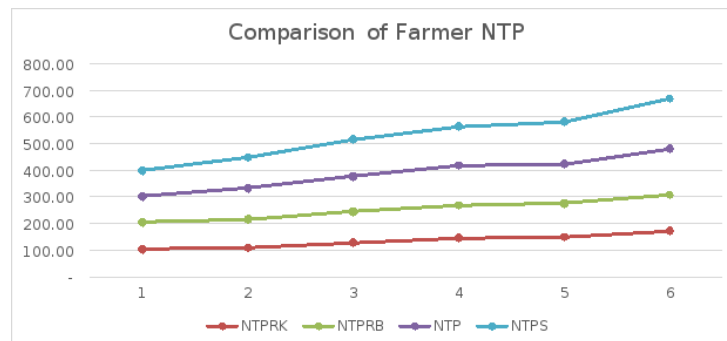


Figure 1. Comparison of Farmer NTP with Riau Province Welfare Statistics NTP

Description:

NTPRK: Farmer NTP on dry land typology

NTPRB: Farmer NTP for wetland typology

NTP: NTP for the agricultural sector

NTPS: NTP for sub-sectors

The Farmer Exchange Rate (NTP) is used to compare the NTP for palm oil plantations on dry land with that on wet land, as well as between the NTP for agriculture and the palm oil plantation sub-sector. Analysis of comparative data over six years (2020-2025) for independent smallholder oil palm farmers in Riau Province reveals a sharp and significant economic divergence, driven primarily by land typology and other factors, including management patterns and input factors. This period witnessed a substantial improvement in the welfare of all farmers, as reflected in the increase in the Farmer Exchange Rate (NTP). This increase was primarily driven by external factors, particularly the post-pandemic global commodity price boom, which raised the price of Fresh Fruit Bunches (FFB). The NTP gap occurred between the NTP of dry land and the plantation sub-sector, which far exceeded that of wet land/agriculture. The sharp increase in the Plantation NTP, driven by high global commodity prices such as CPO, suggests that export-oriented farmers experienced a significantly greater welfare surplus (BPS, 2024). Therefore, every farming household must be able to produce FFB effectively and efficiently, utilising resources (Mustofa & Bakce, 2024).

CONCLUSION

In conclusion, this study provides important insights into the economic conditions and welfare dynamics of palm oil farmers. The findings indicate a positive trend in farmers' income levels, accompanied by a decrease in their overall expenditure. This pattern suggests that farmers are becoming more efficient in managing their financial resources, either through improved production

practices, better market access, or more prudent household spending. The combination of rising income and declining expenses contributes to greater financial stability and resilience among farming households.

Furthermore, the analysis reveals that farmers cultivating dry land exhibit a higher exchange rate compared to those operating on wet land. This difference may reflect variations in production costs, land management practices, or market opportunities associated with different types of land. However, despite this relative advantage, the exchange rate of farmers in this study remains lower than the average exchange rate of farmers in the broader agricultural sector, as well as lower than that of specific agricultural sub-sectors. This indicates that palm oil farmers still face structural and market-related challenges that limit their overall economic competitiveness. Lastly, the welfare level of palm oil farmers has shown a consistent upward trend over the past six years. This improvement reflects gradual progress in their living standards, access to resources, and economic security. Although this trend is encouraging, sustained policy support, improved infrastructure, and fair market mechanisms are essential to ensure that this positive development continues and becomes more evenly distributed among farmers.

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