Research Article

What is the Existing Condition of Palm Oil Plantation Management in Riau Province, Indonesia?

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Abstract.
This study aims to describe the management of oil palm plantations in Riau Province using a qualitative method. The Nvivo 12 Plus software was used to analyze the data, which came from the results of interviews with each of the important actors. The results of this study showed that the social and legal aspects of managing oil palm plantations (37.93%), the economic aspects (34.48%), and the ecological aspects (27.59%) were the ones that stood out the most. The public has a general idea of what the economic benefits of oil palm are and what stakeholders think about them. From an environmental point of view, oil palm plantations are very important for keeping soil and water in place. However,, when you look at oil palm from a social and legal point of view, you can see that it has helped make residents' incomes more equal. Therefore, it is important to remember that oil palm plantations need to be constantly and thoroughly monitored and evaluated by the people in charge of them.

Keywords: existing, management, plantation, palm oil

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1. Introduction

Fundamentally, the palm oil industry is one sector that has undergone many changes due to globalization (1). In Indonesia, palm oil is a superior product that is important for the economy and is one of the largest industrial oil palm plantation countries in Southeast Asia (2,3). Compared to countries such as Malaysia, Nigeria, Thailand, and Colombia, Indonesia plays a much larger role in palm oil production worldwide (4,5). The success of developing the palm oil industry in Indonesia cannot be separated from the contribution of smallholder oil palm plantations which reached 49 million tons in 2021, an increase of 2.9% compared to the previous year's total of 48.3 million tons. Based on the distribution of oil palm plantations among 26 provinces in Indonesia, Riau Province has the largest oil palm plantation area with 2.86 million hectares in 2021 or 19.16% of the total area of oil palm plantations in Indonesia. Oil palm production in

Riau will reach 10.27 million tons in 2021. This number is the highest in Indonesia and accounts for 20.66% of national palm oil production (6). Figure 1 shows the area of oil palm plantations in the province of Indonesia:

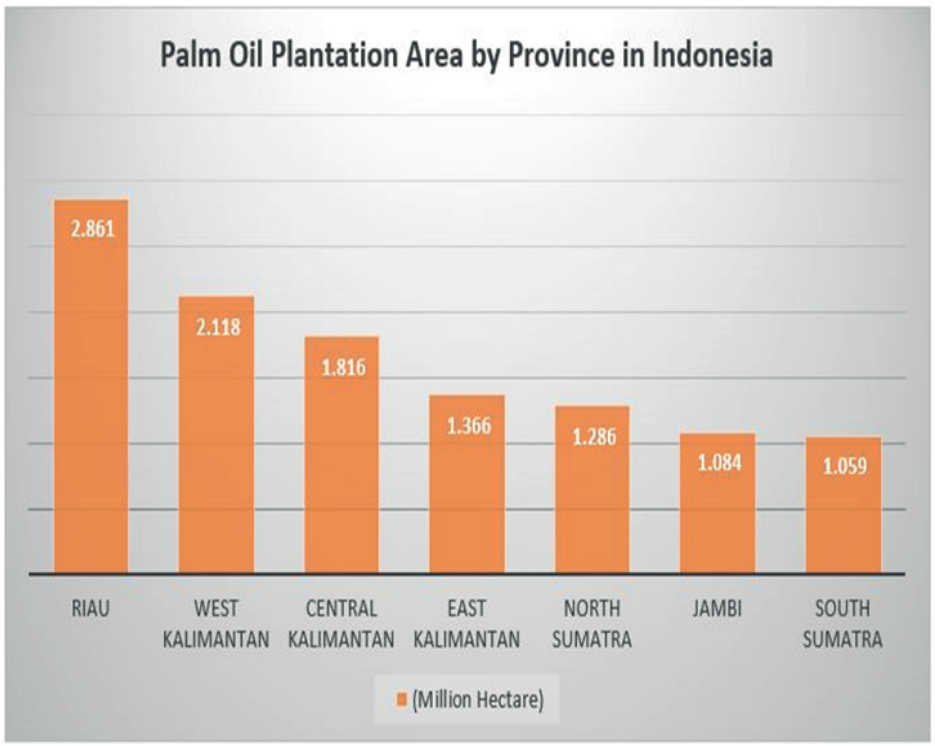

Figure 1: Oil Palm Plantation Area by Province in Indonesia. *Source:* dataindonesia.id (7).

Built-in, oil palm plantations serve a variety of purposes, including economic, social, and environmental aspects unique to agriculture. Oil palm plantations contribute economically, socially, and environmentally to the achievement of the Sustainable Development Goals (SDGs). Empirical contributions from the palm oil sector to the economy include encouraging economic growth (national and regional), a source of foreign exchange, and generating state revenues, while from a social perspective it helps rural development and poverty alleviation. From an ecological perspective, oil palm plantations contribute to carbon dioxide and oxygen cycle conservation, land restoration, soil, and water conservation, increasing land biomass and carbon stock, and reducing greenhouse gas emissions/peatland improvement. With this whole paradigm, the Indonesian palm oil industry continues to grow in a sustainable perspective (8,9). Based on these conditions, the government has made various efforts to support the strengthening of the role of farmers in sustainable oil palm plantations, where several policies have been regulated the government for the holistic development of oil palm plantations (10,11).

The results of previous studies have also explained that the expansion of oil palm areas has put pressure on forests and surrounding resources (12). Oil palm farming provides an opportunity to increase family income. Oil palm can change the lives of farming communities in rural areas, so the demand for land is quite high (13). The territory of Indonesia is very suitable for oil palm development. Oil palm is land-based farming and depends on the fertility of the land. Oil palm is a tropical plant that requires sufficient temperature, soil type, altitude, and rainfall to get maximum yields (12,14). Then, oil palm in Riau Province has boosted economic growth and alleviated poverty (15). According to Gilroy et al. (16) it was explained that palm oil is an important raw material for making things such as cooking oil, soap, cosmetics, steel, wire, leather, and medicine. However, oil palm plantations, which are the main source of CPO, are not developed in Europe. Due to the high demand for CPO worldwide, Indonesia has become one of the countries that produce it, but at a low price. Furthermore, the reality faced today is that developed countries have capital in terms of management compared to developing countries which so far have only been producers with a large number of workers. The limitations of technology and capital force oil palm farmers and palm oil mills to export palm oil to Europe and abroad to be processed into valuable products. The processed CPO products are resold to countries of origin or producing countries (17,18).

Furthermore, in the context of the increasingly rapid development of oil palm plantations in Riau Province, the process has encouraged many plantation business actors, both farmers and entrepreneurs to clear land to plant oil palm (19). Thus, various problems often occur as a result of the oil palm development process which includes: First, land clearing carried out without procedures that have an impact on environmental damage such as forest and land fires which causes the first problem, namely the haze that has been occurring, especially in Riau Province (11,19). Second, there are consequences of the global market through free trade campaigns, where the free market mechanism will only benefit strong producers (1). The paradigm that has developed so far that Indonesia is only a market has caused Indonesia to become a consumptive country for processed CPO products with relatively high purchase prices (18). Third, the issue of Sustainable Development Goals (SDGs) focuses on the environment, alleviating poverty, and improving the economy of local communities (17,20).

In the process, mass production of palm oil requires large-scale land conversion, resulting in Indonesia experiencing annual primary forest loss (21). Plantation growth is indeed an economic solution to meet market needs, but when there is environmental damage and social conflict, of course, it becomes contradictory to sustainability goals

(22–24). Based on this phenomenon, this study aims to explain how the existing conditions of oil palm plantation management are viewed from the ecological, economic, social, and legal aspects of Riau Province.

2. Methods

This study uses a qualitative approach as a contextual study in systematically exploring a particular phenomenon (25). The data in this study came from primary and secondary data. Primary data were obtained from focus group discussion (FGD) notes and interviews with relevant informants. Secondary data were obtained from various books, government websites, proceedings, and research journals. Then, the data collection techniques in this study used documentation and interview techniques that focused on collecting data related to existing conditions in the management of oil palm plantations in Riau Province. Furthermore, this research data analysis technique uses Nvivo 12 Plus software through group query analysis features, crosstab query analysis, and matrix coding query analysis to explain the research variables that affect the research object, find the percentage of concepts (nodes) in the study, and explore the data to find certain data patterns with combinations that are relevant to the research focus (26,27).

Procedurally, the research data analysis was carried out in three stages, namely: First, analyzing the data with the group query analysis feature to determine the informants' perceptions and thoughts on the concepts used in the study. Second, analyze the data through the crosstab query analysis feature to find the percentage of concepts (nodes) used based on variables. Third, analyze the data through the matrix coding query feature to explore the data with a flexible approach to understand what is happening in the data with a more focused perspective. Fourth, conclude and interpret the primary and secondary data that have been analyzed. Therefore, this article attempts to explain how the existing conditions of oil palm plantation management in Riau Province.

3. Results and Discussion

3.1. Existing Condition of Palm Oil Plantation Management in Riau Province

Essentially, the government's policy to develop oil palm plantations is a positive thing and is considered to be able to help farmers' economic growth (23,28). In the context of oil palm plantations in Indonesia, Riau Province is listed as having the largest oil

palm plantation in Indonesia, reaching 2.86 million hectares (19.16%) of the total area of oil palm plantations in Indonesia in 2021. In addition, In 2021, palm oil production in Riau Province will reach 10.27 million tons. This is the largest percentage in Indonesia which represents 20.66% of the national palm oil production (6). The palm oil sector has become a significant contributor to the national economy, particularly in Riau Province. The exponentially increasing global demand for vegetable crops and the role of oil palm in the renewable energy generation cycle will ensure the sustainable growth and development of the palm oil market. The development of national CPO production and exports that continue to increase in various countries shows that palm oil has a fairly large market share. As the largest palm oil sector in Indonesia, Riau is a reliable source of vegetable oil for the global market. So that the sustainability of Riau palm oil is needed so that the positive impacts of this sector can continue to be managed (8). Based on the results of the group query analysis in Figure 2, it is found that each stakeholder has various perceptions of the existing conditions of oil palm plantation management in Riau Province:

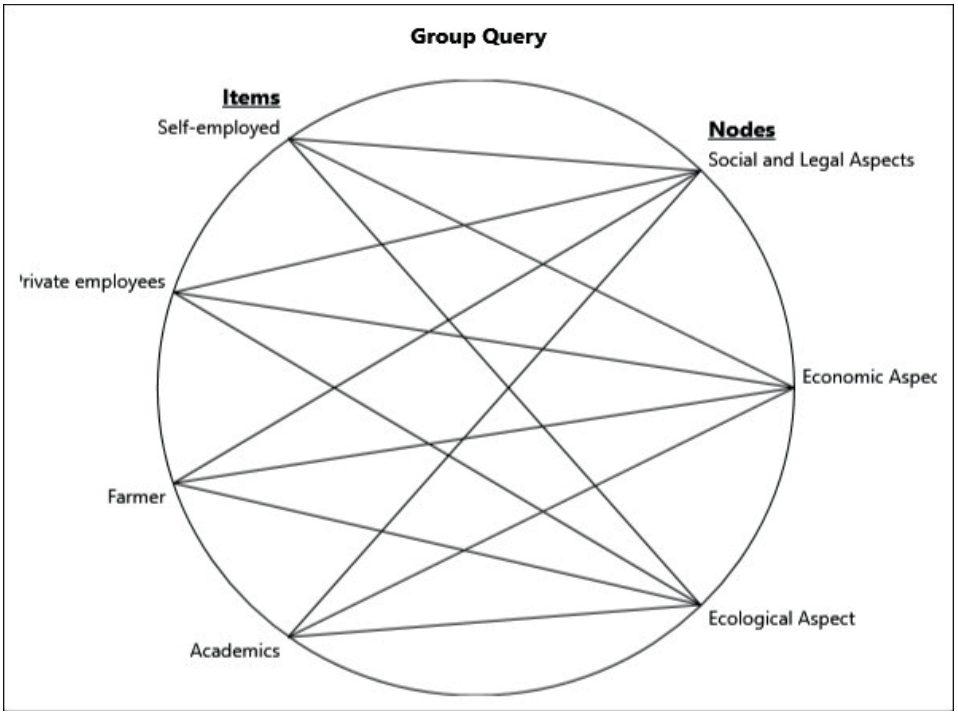

Figure 2: Group Query Analysis in Palm Oil Plantation Management. *Source:* analysis using Nvivo 12 Plus, 2022.

The perception of each stakeholder is depicted on each connected line and node in Figure 2. Then, for each element, there is a direction arrow that shows the ideas of each stakeholder who believes in the condition of oil palm plantation management in Riau Province which can be seen from social and legal, economic, and ecological

aspects. Each of these aspects has a relatively similar level of urgency but is perceived to have a different role by each actor in the context of managing oil palm plantations in Riau Province. Juniyanti et al. (22) explains that each actor who plays a role in natural resource management will have different connections and power with one another, whereas actors who have strong connections will be able to determine strategies to improve natural resource governance and apply the process at each level.

Then, the results of interviews with each actor who have been analyzed through the crosstab query feature in Figure 3, it is found that the existing conditions of oil palm plantation management in Riau Province have relatively different percentages in each aspect, namely:

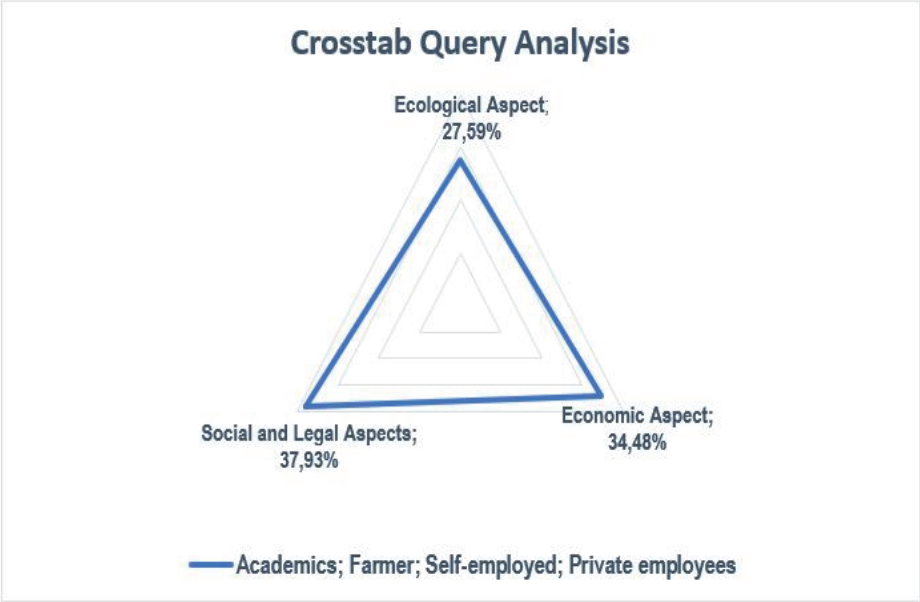

Figure 3: Crosstab Query Analysis in Palm Oil Plantation Management Aspect. *Source:* analysis using Nvivo 12 Plus, 2022.

Figure 3 shows that the existing conditions in the management of oil palm plantations in Riau Province are dominated by social and legal aspects (37.93%), followed by economic aspects (34.48%) and ecological aspects (27.59%). If examined further, every existing actor (academics, farmers, entrepreneurs, and private employees) believes that the social and legal aspects of managing oil palm plantations in Riau Province are still experiencing complex dynamics such as the absence of health insurance and employment insurance for smallholders provided by the local government and related companies. As a result, oil palm farmers have to bear all the consequences themselves in the process of managing the plantation. In addition, the existence of other problems such as the lack of knowledge of farmers about regulations and legal products regarding the management of oil palm plantations has also emphasized that the existence of

regulations has not been able to fully guarantee the problems that often occur between farmers and entrepreneurs in sustainably managing oil palm plantations.

Research by Hidayat et al. (29) explains that how to combine a more authoritative regulatory execution mechanism with a persuasive balance between sustainability goals and economic interests in the palm oil industry sector is the biggest governance challenge in oil palm management. Then on the economic aspect, currently there is a Regulation of the Minister of Agriculture Number 01 of 2018 concerning Guidelines for Determining the Purchase Price of Fresh Fruit Bunches (FFB) for Palm Oil Production (national regulation) and Governor Regulation Number 5 of 2021 concerning Amendments to Governor Regulation Number 77 of 2020 concerning Procedures for Determining the Purchase Price of Fresh Fruit Bunches (FFB) for Palm Oil Production by Smallholders in Riau Province (local regulation) which aims to guarantee the price of fresh fruit bunches (FFB) of self-produced oil palm to get a fair selling price, which in the context of, In this case, farmers always maintain a harmonious relationship with the company and the government to maintain price stability and household income. However, many oil palm farmers and plantation companies still complain about the low price of oil palm fresh fruit bunches (FFB). Not only that, in the face of a possible decline in the price of oil palm fresh fruit bunches (FFB). Astuti et al. (30) have emphasized that oil palm farmers in the process have income and businesses from other sectors so that they do not depend on one income (palm) only.

Furthermore, in the ecological aspect of managing oil palm plantations in Riau Province, the process has taken into account the dimensions of environmental sustainability and there are still some things that are contrary to ecological principles such as illegal land clearing which should not be carried out and various other problems in governance that have not been comprehensively transparent. Although there is still a need for improvement in terms of ecology in the management of oil palm which tends to damage the environment by certain elements, in essence, the management of palm oil does not damage the environment, because it turns out that palm oil waste can be processed into solid fertilizer, liquid fertilizer, paper raw materials, and biogas. The results of processing palm oil waste are mainly in the form of solid and liquid fertilizers which are then re-applied to plantations (31,32).

3.2. Stakeholder Perceptions in the Existing Condition of Oil Palm Plantation Management in Riau Province

As part of regional development, the development of oil palm plantations is closely related to economic, social, ecological, and political factors. From an economic perspective, oil palm plantations have contributed significantly to the country's foreign exchange earnings. Socially, it has been able to absorb labor both in agriculture and industry. From an ecological perspective, plantation businesses prioritize the preservation of natural resources. From a political perspective, oil palm plantations can encourage democratization at the local level by implementing agricultural policies that improve the welfare and prosperity of local communities (33,34). Based on the results of interviews with each actor who has been analyzed through the matrix coding query feature in table 1, it is found that each stakeholder has varying perceptions of the existing conditions of oil palm plantation management in Riau Province, namely:

Table 1: Analysis of Coding Query Matrix by Stakeholders on Existing Conditions of Palm Oil Plantation Management

No	Aspect	Stakeholders			
		Academics	Farmer	Private Employees	Self-employed
1	Ecological	27,81%	24,06%	23,53%	24,6%
2	Economic	38,54%	16,59%	30,24%	14,63%
3	Social and Legal	24,85%	26,65%	25,75%	22,75%

Source: analysis using Nvivo 12 Plus, 2022.

Table 1 above shows that each stakeholder has a perception of each aspect of the existing condition of oil palm plantation management in Riau Province. Academics are the dominant stakeholders in viewing the ecological aspects (27.81%) and economic aspects (38.54%). Then, on the social and legal aspects, the farmer (26.65%) is the dominant stakeholder in viewing these dimensions. According to each stakeholder, without transparent and effective monitoring and evaluation of all aspects, including ecological, economic, social, and legal, it is difficult to understand success and determine the best way to secure the sustainable growth of oil palm in the future. Then, each stakeholder has a good opinion about the planned role to play in promoting environmental sustainability in the palm oil commodity industry and creating best practice standards. However, several challenges remain, such as inadequate monitoring and assessment, which contribute to perceptions of ineffectiveness and lack of confidence in the capacity to achieve major transformations in oil palm plantation governance (35,36).

In general, the role of each stakeholder has not functioned properly because there are still problems in the implementation of roles that cause role dysfunction for some stakeholders. In terms of perception, stakeholders have a positive view and are motivated to ensure the sustainability of the palm oil sector in Riau Province. Technical limitations such as inadequate human resource capacity, coordination system, division of authority, financial management, delays in the ratification of the Regional Spatial Plan (RTRW), and government policies tend to cause role dysfunction (36). Nevertheless, local economic growth in Riau currently has the potential to be increased if the existing obstacles can be overcome because there is consensus and a desire to optimize the role of stakeholders taking into account the current state of oil palm cultivation. On the economic side, oil palm in Riau Province has boosted economic growth and alleviated poverty (20). In this aspect, the palm oil industry has encouraged sustainable development by providing sources and state revenues, encouraging local economic growth, and increasing farmers' incomes. The growth of the palm oil business is also inclusive, that is, it encourages the growth of other industries. The economic benefits of palm oil are also enjoyed by residents of importing countries, such as the European Union, which provides substantial benefits for GDP, government revenues, and prospects for EU cooperation.

Then on the ecological side, oil palm plantations play an important role in the soil and water conservation system in Riau. The enormous root system of oil palm plantations serves as a scientific bio pure system. This natural bio pure system will accelerate the absorption and infiltration of surface water, thereby reducing soil and water erosion. The water storage system in the soil bio pure allows oil palm plantation areas to effectively control flooding when it rains and avoid drought when rainfall decreases. In addition, compared to other crops, oil palm is relatively water efficient (not wasteful of water) while producing bioenergy (37).

Furthermore, from a social and legal perspective, oil palm plantations have contributed to reducing income inequality and progress. However, without proper procedures, land clearing can result in environmental damage such as forest and land fires, which contributes to the persistent pollution problem in Riau Province. To grow oil palm plantations sustainably, transparent and effective monitoring and evaluation of social and legal factors must be carried out (38). Therefore, cooperation and collaboration from all stakeholders are needed for sustainable palm oil development.

4. Conclusion

The findings of this study indicate that the existing conditions in the management of oil palm plantations in Riau Province that are highly highlighted are the social and legal aspects (37.93%), followed by economic aspects (34.48%) and ecological aspects (27.59%). In the process, it is important to pay attention to such things as the fact that local governments and companies do not offer health insurance and employment insurance to oil palm smallholders, and that smallholders do not know much about the rules and laws that apply to managing oil palm plantations. Both of these are important points that need to be improved at the social and legal levels. From an economic perspective, farmers always try to maintain harmony with companies and the government so that prices remain stable and they can earn a living. However, there are still many oil palm farmers and plantation companies who are not happy with the low price of oil palm fresh fruit bunches (FFB). In the management of oil palm plantations in Riau Province from an ecological perspective, the process has taken into account various aspects of environmental sustainability. However, there are still things that are against ecological principles, such as illegal land clearing and other problems. in a government that is not yet fully transparent.

Then, in the perception of stakeholders on the economic side, palm oil in Riau Province has encouraged economic growth and alleviated poverty. On the ecological side, oil palm plays an important role in the soil and water conservation system in Riau. From a social and legal perspective, oil palm plantations have contributed to the reduction of income inequality and progress, where transparent and effective monitoring and evaluation of social and legal aspects must be carried out.

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