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# ANALYSIS OF COMMUNITY OIL PALM PLANTATION MANAGEMENT IN NAGARI SITIUNG DISTRICT, SITIUNG, DHARMASRAYA REGENCY

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**Abstract:** This study aims to analyze the management of oil palm plantations by the community in Nagari Sitiung, Sitiung District, Dharmasraya Regency. The study concentrated on three principal dimensions: land planning and selection, accessibility to facilities and infrastructure, and environmental degradation resulting from oil palm plantations in Nagari Sitiung. The research method used was descriptive quantitative research, with data collected through observation, interviews, and questionnaires distributed to 100 respondents. The results indicated that 1) land planning and selection for oil palm plantations were carried out taking into account soil fertility, slope, water availability, and flood risk, with a Respondent Achievement Rate (TCR) of 84.62%, which is considered satisfactory, 2) Access to facilities and infrastructure was deemed adequate, including easy access to fertilizer, agricultural equipment, and road access, with a TCR of 84.18%. 3) Most farmers have abandoned the practice of land clearing by burning and prefer manual or mechanical methods, indicating an increased awareness of the negative impacts of smoke and soil degradation. However, the use of chemical fertilizers and pesticides is still very dominant because they are considered more effective and easy to obtain, while the management of harvest waste is carried out simply by leaving it on the land or making it into natural compost.

**Keywords:** Palm Oil Plantation, Land Management, Environmental Impact

## INTRODUCTION

Oil palm plantations are a strategic sector in Indonesia's economic development, contributing significantly to Gross Domestic Product (GDP) and serving as a major source of foreign exchange through crude palm oil (CPO) exports. Locally, oil palm also plays a key role in supporting the rural economy, including in Dharmasraya Regency, West Sumatra Province. Nagari Sitiung is one of the areas experiencing rapid growth in oil palm plantations managed by smallholders. Based on observations from 2023-2024, the area of oil palm plantations in this area increased from 246 hectares to 453 hectares.
Nevertheless, the management of smallholder oil palm plantations continues to encounter a variety of challenges, including low capital, limited access to production facilities, weak farmer institutions, and environmental impacts as a result of cultivation practices that are not entirely sustainable, despite the economic benefits (Central Statistics Agency [BPS], 2023; Directorate General of Plantations, 2022; Qaim et al., 2020).

Community management of oil palm plantations includes land planning, seed selection, maintenance, and harvesting. According to Pakpahan (2018), plantation management must consider technical, economic, and environmental aspects to ensure optimal and sustainable production. Economic factors (capital, FFB prices), social factors (education, farmer groups), environmental factors (soil type, climate), and government policies (subsidies and ISPO regulations) also influence management success (Tusrini, 2023; Widodo, 2022). Meanwhile, oil palm expansion also has socio-economic and environmental impacts, ranging from increased income to the risk of land degradation and land conflicts (Adawiyah, 2024; Irawan et al., 2025).

Although Nagari Sitiung has extensive and fertile land potential, the management of community oil palm plantations still faces problems: 1) Land planning and selection are not fully based on technical studies. 2) There is still limited access to production facilities, fertilizers, agricultural tools, and infrastructure. 3) Awareness of environmentally friendly practices is still low, marked by the dominant use of chemical fertilizers and pesticides.

This study attempts to analyze the actual conditions of community oil palm plantation management in Nagari Sitiung through a quantitative descriptive approach. Information was gathered by observation, surveys, and interviews with a cohort of 100 participants. The evaluation was performed to examine elements of land use and selection, accessibility to infrastructure, and ecological consequences. The findings of the research are anticipated to yield an accurate representation that will inform the formulation of policies aimed at enhancing oil palm management in a manner that is more efficient, egalitarian, and sustainable. Most previous studies tend to focus on a single aspect, such as land use planning or the environmental impact of oil palm plantations.

This study attempts to fill this gap by integrating three main aspects simultaneously: land planning and selection, community access to plantation facilities and infrastructure, and the resulting environmental impacts. Furthermore, this research was conducted in Nagari Sitiung, which until now has been relatively rare as a location for similar studies. This study aims to 1) analyze the planning and selection of community oil palm plantation land in Nagari Sitiung. 2) Determine community access to facilities and infrastructure for oil palm plantations. 3) Assess the environmental damage caused by activities related to oil palm plantations in Nagari Sitiung.

## LITERATURE REVIEW

Oil palm (Elaeis guineensis) is a plantation crop originating from West Africa and has been a leading commodity in Indonesia since the 19th century. Indonesia is the world's largest producer of palm oil right now. It has more than 14 million hectares of land and produces 45 million tons of CPO each year (Directorate General of Plantations, 2022). Oil palm plantations are vital in augmenting the nation's foreign exchange revenues, fostering employment, and enhancing the quality of life for rural inhabitants (Fadjar, 2016).

Management of oil palm plantations encompasses a series of activities, from land selection and planting to maintenance and harvesting. According to Pakpahan (2018), effective plantation management must consider technical aspects (land suitability, seeds, and maintenance), economic aspects (capital and marketing), and environmental aspects (soil and water conservation). Local communities tend to use traditional systems that rely on inherited experience, although some have begun to adopt modern technology and group cultivation practices (Lington, 2025).

A farming strategy is a farmer's action plan to achieve business efficiency and sustainability. Yusuf (2018) asserts that agricultural development strategies should capitalize on internal advantages and external prospects while mitigating limitations and dangers. Effective plantation management, according to Pakpahan (2018), must take into account environmental factors (soil and water conservation), economic factors (capital and marketing), and technical factors (land suitability, seeds, and maintenance) (Salmawati, 2018).

The proliferation of oil palm plants yields several effects. From an environmental perspective, land conversion may result in a decline in biodiversity, soil degradation, and the release of greenhouse gases (Adawiyah, 2024). Oil palm, economically, boosts farmers' incomes and generates jobs, yet the distribution of these benefits is often uneven (Angga, 2021). Socially, oil palm plantations can change social structures, trigger land conflicts, and shift local wisdom (Irawan et al., 2025).

## RESEARCH METHODS

This segment delineates the approaches utilized for data acquisition, the origins of the data, and the analytical methodologies applied. This study employs a quantitative descriptive methodology via a survey technique. This strategy was adopted to illustrate an exact portrayal of the community's oversight of oil palm agriculture in Nagari Sitiung, Sitiung District, Dharmasraya Regency. The investigation took place in Nagari Sitiung, within the Sitiung District of Dharmasraya Regency, in West Sumatra Province. The investigation locale is partitioned into 12 hamlets, spanning around 579 hectares of oil palm plantations administered by smallholders. Data collection took place from April to July 2025.

The population in this study was all heads of families (KK) in Nagari Sitiung who own and manage oil palm plantations, with a total of 2,285 KK. The Slovin formula was used to figure out the sample size, which had a 10% margin of error. This meant that 100 people were chosen to be the research sample. The 10% margin of error was chosen due to the relatively large population and wide distribution area but still allows for accurate and efficient results in terms of time, cost, and effort. The number of 100 respondents is considered representative enough to describe the condition of community oil palm plantation management in 12 jorong, because the distribution of respondents was carried out proportionally based on the number of heads of families in each jorong.

A random sampling technique was used to ensure that each head of household had an equal opportunity to be selected as a respondent. This ensured that the sample obtained truly reflected the diversity of socio-economic conditions, land area, and management patterns across all hamlets in Nagari Sitiung. Thus, the research results are expected to objectively describe the general condition of the community and be scientifically accountable. The information utilized includes 1) primary data, gathered through surveys, interviews, and direct field observations.

Secondary data sourced from village administrative papers, the Central Statistics Agency, and other literature. The information utilized includes 1) original data, gathered through questionnaires, interviews, and firsthand observations in the field. Secondary data sourced from village administrative papers, the Central Statistics Agency, and other literature.

Data were analyzed using quantitative descriptive statistical methods. The analysis steps include:

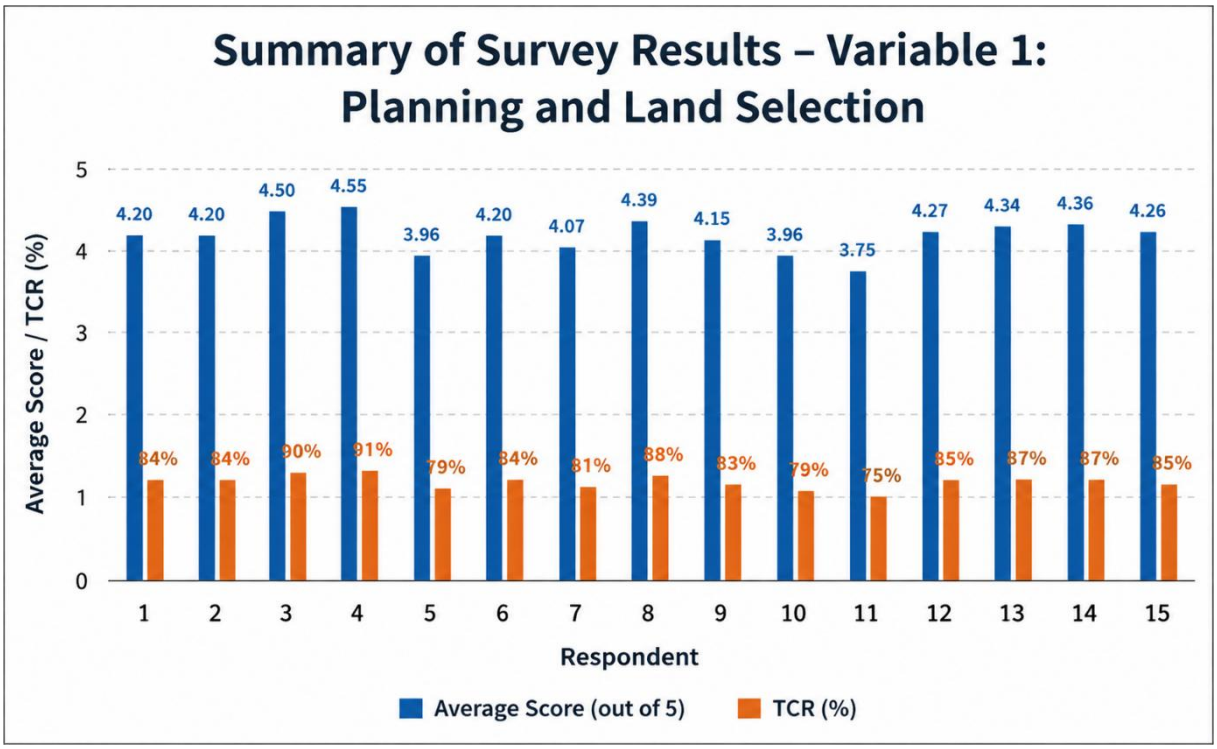
1. Tabulation of respondents' answers based on the questionnaire.
2. Calculation of scores using a Likert scale.
3. The Respondent Achievement Level (TCR) is determined using the following formula:

$$TCR = \frac{\text{Skor yang diperoleh}}{\text{Skor ideal}} \times 100\%$$

4. The assessment criteria are set as follows:
   - 85%–100% = Very Good
   - 66%–84% = Good
   - 51%–65% = Sufficient
   - 36%–50% = Not Good
   - 0%–35% = Not Good (Sugiyono, 2017).

## RESULTS AND DISCUSSION

**Diagram for Land Planning and Selection 1. Overview of Questionnaire Findings for Variable 1: Land Utilization and Selection**

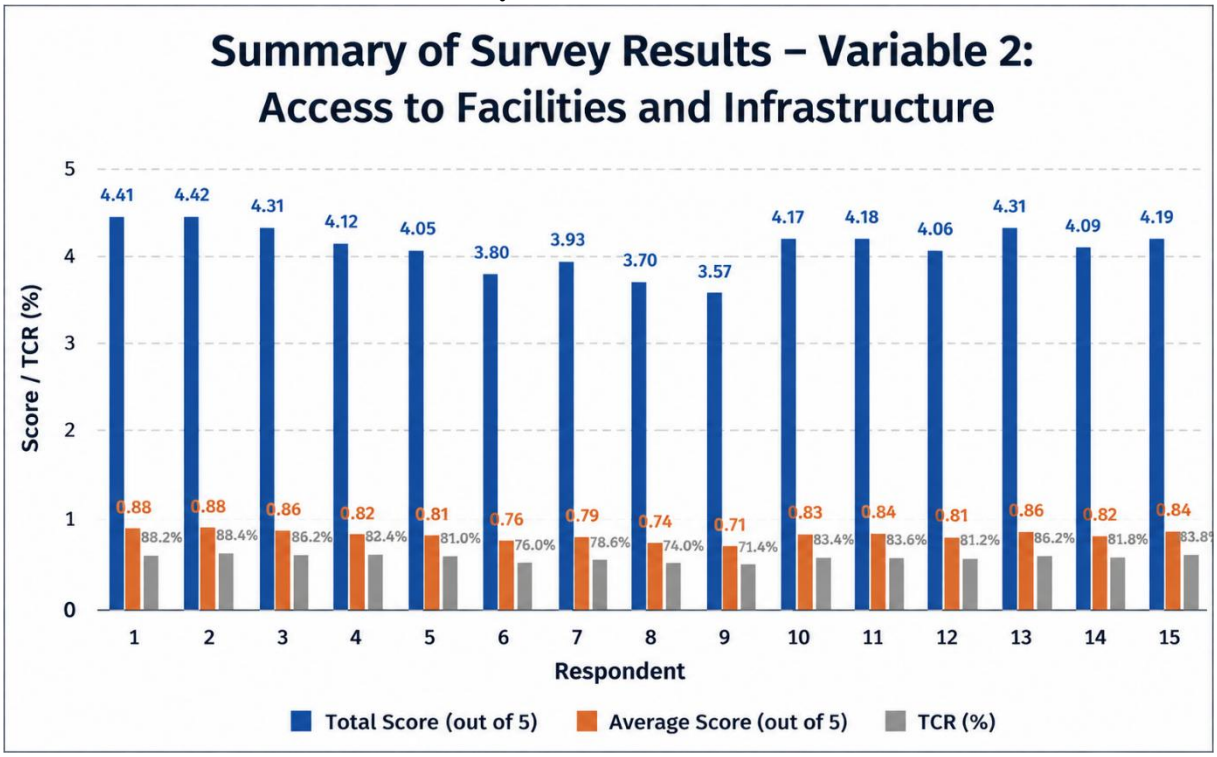


The research results show that land planning and selection in Nagari Sitiung were carried out by considering soil fertility, land slope, water availability, flood risk, and transportation accessibility. The overall Respondent Achievement Rate (TCR) reached 84.62% (good category). Soil fertility (TCR 89.2%) and water availability (TCR 89.6%) received the highest scores among all indicators. These findings indicate that farmers have relatively satisfactory agronomic awareness, although some other technical aspects, such as transportation accessibility (TCR 79.2%), are not yet fully optimal.

Farmers' awareness of soil fertility and water availability aligns with Paloma's (2017) findings, which emphasize that oil palm productivity is highly dependent on land suitability, particularly physical factors such as soil texture, organic matter content, and water management. Widodo (2022) also added that selecting land based on appropriate slopes can reduce the risk of erosion, facilitate plantation maintenance, and maintain long-term productivity sustainability.

However, in terms of transportation accessibility and road conditions, a lower TCR indicates significant obstacles. Inadequate plantation road infrastructure can increase operational expenses, delay Fresh Fruit Bunches (FFB) transportation, and reduce the quality of the harvest due to delays to the palm oil mill. This condition is similar to the results of Resmawan's (2016) research in West Kalimantan, where limited infrastructure is a major obstacle to the efficient distribution of smallholder plantation products. Overall, land planning in Nagari Sitiung shows that farmers prioritize agronomic factors over infrastructure, which in the long term can become a constraint in the palm oil supply chain. To balance high productivity with distribution efficiency, an integration strategy between technical planning and infrastructure support is crucial.

**Availability of Facilities and Infrastructure Diagram 2. Overview of Survey Findings for Variable 2: Availability of Amenities and Infrastructure**




The analysis indicated that access to facilities and infrastructure achieved a TCR of 84.18% (good category). The factor with the highest score was ease of access to fertilizer (TCR 88%), followed by availability of agricultural equipment, market price information, and road access to the plantation. However, the indicator with the lowest score was access to business capital (TCR 76%), indicating farmers' limited access to formal financing from financial institutions. This finding is consistent with Tusrini (2023), who stated that the availability of production facilities and institutional support play a crucial role in

increasing the efficiency of smallholder oil palm farming. Limited access to capital in Nagari Sitiung illustrates a structural gap similar to that found by Bandrang (2023) in Riau, where farmers often rely on middlemen or collectors for capital, which then binds them to a system of selling their produce at below-market prices.

The availability of adequate production facilities in Nagari Sitiung indicates that fertilizer and equipment distribution channels are generally running smoothly. However, limited capital remains a barrier to optimizing the use of these facilities. Research by Fahmid (2018) and Yusuf (2018) suggests that the existence of active farmer groups can be a solution, as, in addition to strengthening bargaining power, these institutions can also serve as a gateway to government capital programs and production facility subsidies.

In the context of Nagari Sitiung, this institutional strengthening is relevant because the role of farmer groups is currently suboptimal. Integrated mentoring programs, including extension services, capital facilitation, and strengthening marketing networks, are needed to ensure access to facilities and infrastructure truly impacts farmer productivity and well-being.

## 1. Environmental Management

Environmental management attained a TCR of 78.15%, deemed adequate. The majority of farmers continue to depend significantly on synthetic fertilizers and pesticides, with no conservation initiatives. A limited quantity of agriculturists cultivate cover crops, construct terraces, or convert organic refuse into compost. These findings align with Adawiyah (2024), who revealed that the expansion of smallholder oil palm plantations often ignores sustainability principles, triggering land degradation, river sedimentation, and declining water quality. Irawan et al. (2025) further illustrated that the minimal uptake of eco-friendly technology in smallholder plantations stems from insufficient technical training and a limited understanding of the enduring advantages of environmental preservation.

Moreover, research conducted by Angga et al. (2021) in West Sulawesi indicated that the increase in income from palm oil often does not result in reinvestment in sustainable practices, but rather is directed towards household expenditures. This trend is similarly observable in Nagari Sitiung, where income from harvests are infrequently allocated towards conservation methods or diversifying businesses.

From a favorable agricultural practices (GAP) perspective, this situation indicates a gap that needs to be filled through policies and programs that prioritize incentives for farmers who implement sustainable cultivation techniques, such as Indonesian Sustainable Palm Oil (ISPO) certification. Widodo (2022) emphasized that implementing ISPO standards on smallholder plantations can increase product competitiveness in the global market while maintaining the ecological function of the land.

## 2. Combining Research Results and Their Effects

Overall, the results of this study indicate that: (1) The technical aspects (planning and land selection) are relatively good but need to be integrated with adequate transportation infrastructure support, (2) Access to infrastructure is quite satisfactory but capital constraints limit the optimal use of these facilities, and (3) Environmental management remains a weak point that needs more attention through education, outreach, and policy incentives.

This pattern is similar to the findings of Sumual et al. (2024), who stated that the management of smallholder plantations will be optimal if there is synergy between increasing the technical capacity of farmers, access to production facilities, and the application of principles of sustainability. In the context of regional policy, the results of this study can be used to develop a farmer empowerment program that emphasizes three things: (1) increasing technical capacity through training and extension, (2) strengthening farmer group institutions to facilitate access to capital and markets, and (3) Establishing reward programs for agriculturalists who embrace sustainable farming practices. This comprehensive strategy aims to enhance the production of smallholder oil palm plantations in Nagari Sitiung sustainably, while preserving environmental integrity and community well-being.

This research theoretically affirms the significance of the sustainability framework for smallholder oil palm plantations in wetland regions, where socio-economic elements, infrastructural accessibility, and environmental practices all influence management efficacy. This finding expands previous literature, which generally focuses on one aspect in isolation. This study broadens understanding of the importance of integrating these three aspects in the local context of Nagari Sitiung.

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## CONCLUSION

This research determines that the administration of community oil palm plantations in Nagari Sitiung, Sitiung District, Dharmasraya Regency is predominantly favorable, especially for planning and land selection (TCR 84.62%) and access to facilities and infrastructure (TCR 84.18%). Agriculturalists have taken into account soil nutrient levels, water accessibility, and terrain gradient in their planning, and they possess comparatively straightforward access to fertilizers and farming implements. Nevertheless, limitations in transportation infrastructure and insufficient corporate capital persist as obstacles that hinder management efficacy. In the interim, environmental management (TCR 78.15%) remains deemed satisfactory, characterized by extensive utilization of chemical fertilizers and minimal adoption of conservation methods.

Consequently, it is essential to enhance farmer capabilities via ongoing extension services, bolster farmer group organizations to provide access to financing and markets, and establish incentives for those who embrace sustainable agricultural practices. This comprehensive strategy aims to enhance the efficiency and sustainability of oil palm farms within the community, while preserving economic, social, and ecological equilibrium in the research region.

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