

Conflict Mitigation Strategies for Sustainable Agriculture in Palm Oil Expansion

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ABSTRACT

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Palm oil prices on the international market have skyrocketed since the increased global demand for vegetable fats. However, the social-economic conflict between companies and smallholders has been an urgent issue in sustainable palm oil plantations. This paper proposes sustainable oil palm plantation strategies based on this problem. This research conducted a social analysis of community-scale oil palm plantation sustainability through in-depth interviews with 50 conflict land owners, palm oil smallholders, government officials, and former employees of a larger palm oil company in South Sumatra. The results of the interviews become the primary data to conduct strategic management system analysis using SWOT-QSPM analysis. SWOT-QSPM combination analyses are used to explore the internal and external problems of smallholder oil palm plantations and offer the best alternatives for smallholder oil palm plantations, where it is utilized to identify crucial internal and external factors influencing palm oil conflicts in Indonesia. The QSPM analysis with a score above 0.50 that is implementable to determining the relative significance of the SWOT analysis strategy shows that SO-ST and WO-WT strategies are suitable to be implemented to achieve sustainable palm oil smallholders plantation in Indonesia. This study concludes that there need alternative strategies for addressing sustainable palm oil plantations challenges in Indonesia, namely: 1) Palm oil companies should be sharing knowledge, training, and assisting palm oil smallholders to be included in their supply chain; 2) Recruiting local people to minimize inequality; and 3) The government to expand the land reform programs, with other alternative strategies eliminated for efficiency due to their significance scores falling below the threshold of 0.5. In conclusion, palm oil companies should prioritize supporting smallholders through knowledge sharing and training, while urging the government to expand Indonesia's land reform program, as these strategies hold significant potential for fostering sustainable development, reducing inequality, and enhancing welfare within the industry and local communities.

1. INTRODUCTION

Palm oil in Indonesia was one of the most prominent Indonesian exports. In 2018, the export value of palm oil reached 29.67 tons, with a total value of USD 18.3 billion [1]. Palm oil production is suspected of increasing, mainly in Indonesia and Malaysia. State policies also play a significant role in increasing the productivity of palm oil. The policy to support palm oil plantations is given by the government of Indonesia, such as subsidies for licensing and investment for the development of smallholder plantations. This policy caused oil palm cultivation to significantly improve with the agricultural model managed by local communities and prominent entrepreneurs in Indonesia. Also, there are small, medium, and large-scale plantations managed by local communities, especially plantations in the form of small-scale plantations [2]. Sustainable palm oil practices cannot exist without supporting sustainable farmers, including oil palm smallholders working in this field. On the other hand, Smallholders in the palm oil sector are generally categorized

based on Minister of Agriculture Regulation No. 98 of 2013, i.e., those whose land ownership is under 25 hectares or below and according to RSPO [3], which is landowners or their delegates that do not have the enforceable decision-making power on the operation of the land and production practices; and freedom to choose how they utilize their lands, type of crops to plant, and how they manage them (whether and how they organize, manage and finance the land). However, most land is owned by companies, and local communities still do not own their property [4].

The expansion of oil palm plantations has become the main trigger for land issues involving companies and the community. This condition is also related to adverse socioeconomic effects due to local population movements and an oil palm value chain with unclear and unprofitable requirements, making oil palm smallholders vulnerable to manipulation by companies and government officials [2]. The problem between companies and the community causing many palm oil companies has drawn criticism from NGOs, especially regarding environmental degradation, land

disputes, and other consequences the local community must bear due to palm production activities. NGOs also launched various campaigns that carry the agenda of stopping oil palm generation. On the other hand, the industrial sector of oil palm plantations also has positive impacts, such as being the primary source of employment, supporting the economies of several provinces in Indonesia, generating employment, and increasing the salaries of workers in the area. However, uncertain legal, regulatory, and overlapping policies are also obstacles for local communities in meeting their socio-economic needs through the oil palm plantation sector [2, 5]. These problems are proven by smallholder palm productivity being only 50% of its production potential [6].

Unequivocally, the primary message of the crusade concentrated on the obliviousness of oil palm companies towards the goals of the Sustainable Development Goals (SDGs) declared by the United Nations. As some targets in SDGs reinforce each other, highlighting potential synergies. In the seven SDG frameworks, there are interactions between palm oil as an energy source, water, and food. For example, palm oil as an energy source improves water efficiency and energy efficiency and reinforces both energy access and sustainable water withdrawal targets. These agendas with Sustainable Development Goals (SDGs) have strengthened the urgency of sustainable palm oil. In this perspective, optimizing yield from existing oil palm plantations is an essential factor in supporting what is called sustainable agriculture. The government has made some efforts, including stimulus to oil palm smallholders who cultivate their land in areas rich in biological resources. Therefore, policies and implementation related to land use planning must be sufficient. Within the plantation scheme in Indonesia, small-scale oil palm farmers are divided into several roles.

With demand continuing to increase and the unclear status of the moratorium on forest clearing for oil palm plantations in Indonesia, palm oil companies are trying to increase the supply of Fresh Fruit Bunches by improving the supply chain. The development of palm oil smallholders can significantly contribute to poverty alleviation and rural development by offering livelihood opportunities, while also promoting economic stability and improving quality of life. The implementation of plasma collaboration on community-owned land entails both positive and negative repercussions, notably leading to conflicts between larger corporations and small-scale oil palm farmers.

One area in Indonesia where conflicts have occurred several times between smallholders and companies is South Sumatra. There are various palm oil companies operate in this area. In addition to major players, there are many small and medium-sized palm oil companies operating in South Sumatra. Table 1 indicates several conflicts between communities and palm oil companies that occurred during the year 2001-2021.

This research conducted in-depth interview with 50 conflict land owners and former employees of larger palm oil company in one village in South Sumatra's areas. This conflict land is mostly community land managed by larger palm oil companies using a plasma system. The conflict started because the companies did not meet the agreed-upon cooperation contract, a profit-sharing system. Moreover, from the interview it is described Free, Prior, and Informed Consent (FPIC) activities were not carried out for some smallholders.

From the point of view of smallholders, the palm oil companies have defrauded the agreed-upon profit-sharing system during the contract period. Initially, smallholders

trusted their land under the plasma procedure operated by the company with the promise of large profits. A profit-sharing system was established to pay the company's capital for land demolition and planting, and smallholders paid in instalments for each harvest. However, until harvest time, smallholders who owned the land claimed they were not receiving the profits as written in the initial contract.

Table 1. Lists of conflicts between palm oil companies and local communities in South Sumatra (2001-2021)

Year of Occurrence	Conflicts
2001-2003	Musi Banyuasin Conflict: This conflict in South Sumatra began in the early 2000s when local communities accused palm oil companies of illegally taking their land. It escalated into violence, and the government intervened to resolve the situation.
2011	Musim Mas Conflict: In 2011, there were allegations of land grabbing and deforestation associated with the Musim Mas palm oil company in South Sumatra. This led to protests and calls for investigations.
2015-2017	Bukit Daun Conflict: The Bukit Daun conflict involved disputes over land ownership and the expansion of palm oil plantations in South Sumatra. It gained significant attention and encouraged discussions on land rights and sustainability.
2016	Bungo Regency Conflict: In Bungo Regency, South Sumatra, there were conflicts between communities and palm oil companies over land use and environmental concerns. Protests and legal actions took place during this period.
2020	Wahana Group Conflict: In 2020, there were reports of land disputes and conflicts involving the Wahana Group, a palm oil company operating in South Sumatra. Local communities accused the company of land grabbing and environmental degradation.

Before the beginning of the contract, smallholders must submit their lands' Certificate of Ownership (COO) to the company as a guarantee. Thus, all the land is then owned by the company. Smallholders cannot take back the COO because, according to the agreement, they will only reclaim the COO if they have paid their debt. Several smallholders who had submitted grievances gave up because there was no resolution.

The smallholder communities were divided into different opinions. Some of the landowners work for the company. Some avoid being bothered by what is happening, and some are disappointed because the larger company has taken the land to manage. Community leaders have created a Semindang Aji Oil Palm Forum for land owners. This forum is moving to take away the rights of the community. Through this forum, the community blocks all Company access to land, offices, housing and other assets at the location.

The in-depth interview results with former palm oil company employees emphasize these findings. They stated that the company could not fulfil the agreed cooperation due to the unproductivity of the land. The company must refrain from continuing the agreement due to their internal conditions: budget and funds, leadership, and unresponsiveness in resolving problems.

This is a scourge for companies, since blocking business access caused lost time, which is considered detrimental from an economic perspective. So far, there has been no attempt to negotiate with the community. The company prefers to develop land in other areas. The company ordered all employees to withdraw from the conflict area. Many employees were laid off and/or transferred. As a result, some employees were demoted and transferred to other regions. The company leaders were worried about casualties due to clashes with the community. The negligence on both sides, resulting in suspicion and distrust towards larger palm oil companies, which became a source of significant conflict.

Many challenges can threaten smallholder Palm Oil Plantation. Research in Sumatra also found a 6.8 tons /ha yield gap between independent and supported farmers. Yield gaps strongly relate to planting practices, as defined in previous research, that fertilization and harvesting frequencies significantly affected yield gaps [6]. Differences in productivity results, planting practices, distribution systems, and science [2, 7, 8] became a challenge for plantations managed by local communities to survive and be socially, economically, and environmentally sustainable. Consequently, the potential negative impacts of oil palm cultivation and sustainability awareness have increased consumer scrutiny [9]. The increasing consumer scrutiny has led to the development of several certification systems and palm oil standards due to the problem of sustainability of this resource, including Roundtable on Sustainable Palm Oil (RSPO), International Sustainability and Carbon Certification (ISCC), Roundtable on Sustainable Biomaterials, and Indonesia Sustainable Palm Oil (ISPO) [9-11]. These certification needs to cover the social impact of development, which became a challenge for local farms to survive. The certification system trend for oil palm plantations does not meet the certification system trend for oil palm plantations [9-11]. However, The inability of these local plantations to meet the requirements is not caused by their unwillingness to meet the requirements but due to limited information, knowledge, and fulfillment of the costs of obtaining the certification [12].

On the other hand, The inequality in benefits derived from the oil palm plantation sector can be an external factor that can threaten local community oil palm plantations [13]. One of the imbalances in the benefits of the development of oil palm plantations for local farmers is the ability to access the legality of land ownership. Local farmers who are most likely not to have land documents have caused their land ownership to be illegally recognized [2]. Another challenge local farmers must face is the productivity of palm oil produced to meet their social and economic needs. Challenges related to the productivity of palm oil that local farmers must face include Risks resulting from natural environmental factors such as temperature, CO₂ concentration, the acidity of the soil, drought, and photosynthetic radiation; Risks generated from the response to yields on planting practices such as inundation systems, drainage, fertilization, eradication of pests and diseases, and land replanting practices; The challenge is to get good-quality seeds. The farmer's education level can also affect the productivity of oil palm because there is a lack of information for the farmer.

In contrast, smallholder and medium-holder local farmers can only sell their palm oil to intermediaries who sell and sort oil palm yields given characteristics [2]. Alternative strategies are needed to be prepared to encourage community

participation in managing mangrove forest ecosystems that are effective and based on sustainable environmental management principles, which cover ecological, economic, and social aspects. Therefore, in this study, we aim to analyze the strengths, shortcomings, opportunities, and threats inherent in the development of oil palm plantations managed by local communities using the SWOT method (Strength, Weakness, Opportunity, Threat) and QSPM Analysis (Quantitative Strategic Planning Matrix).

2. METHODOLOGY

This study will conduct a social analysis of community-scale oil palm plantation sustainability using mixed methods: in-depth interview with key stakeholders and SWOT-QSPM analysis. The primary data collected through key stakeholders mapping and in-depth interviews with 50 conflict land owners, palm oil smallholders, government officials, and former employees of larger palm oil company in South Sumatra. These specific 50 conflict landowners, smallholders, government officials, and former company employees were chosen because they represent key stakeholders directly involved in community-scale oil palm plantation sustainability. They were selected to ensure a comprehensive understanding of the various perspectives and factors influencing sustainability issues. Conflict landowners provide insights into land tenure disputes, smallholders offer perspectives on farming practices and livelihoods, government officials contribute knowledge of policies and regulations, and former company employees share experiences related to corporate practices and community relations. Together, these stakeholders offer a holistic view of the challenges and opportunities for sustainable development in the broader community impacted by oil palm plantations in South Sumatra (Figure 1).

The next phase is conducting strategic management system analysis, namely SWOT analysis and QSPM analysis. The SWOT (Strengths, Weaknesses, Opportunities, Threats) method and QSPM Analysis (Quantitative Strategic Planning Matrix) were chosen for this study due to their effectiveness in systematically evaluating the internal and external factors influencing the development of oil palm plantations managed by local communities. SWOT analysis enables the identification of internal strengths and weaknesses, as well as external opportunities and threats, providing a comprehensive understanding of the project's strategic position. The QSPM Analysis complements SWOT by quantitatively assessing alternative strategies and prioritizing actions based on their potential impact and feasibility [14]. Together, these methods offer a structured approach to strategic planning and decision-making, facilitating the identification of actionable insights and recommendations for sustainable development in the context of community-managed oil palm plantations.

At first, the two analyses were more used in planning business management strategies [14, 15]. Therefore, in this study, we try to use both analysis methods in analyzing the social sustainability management process strategy. In the management strategy process, the SWOT and QSPM analyses are included in formulating and selecting strategies for entry, matching, and decision-making stages (Table 2) [16].

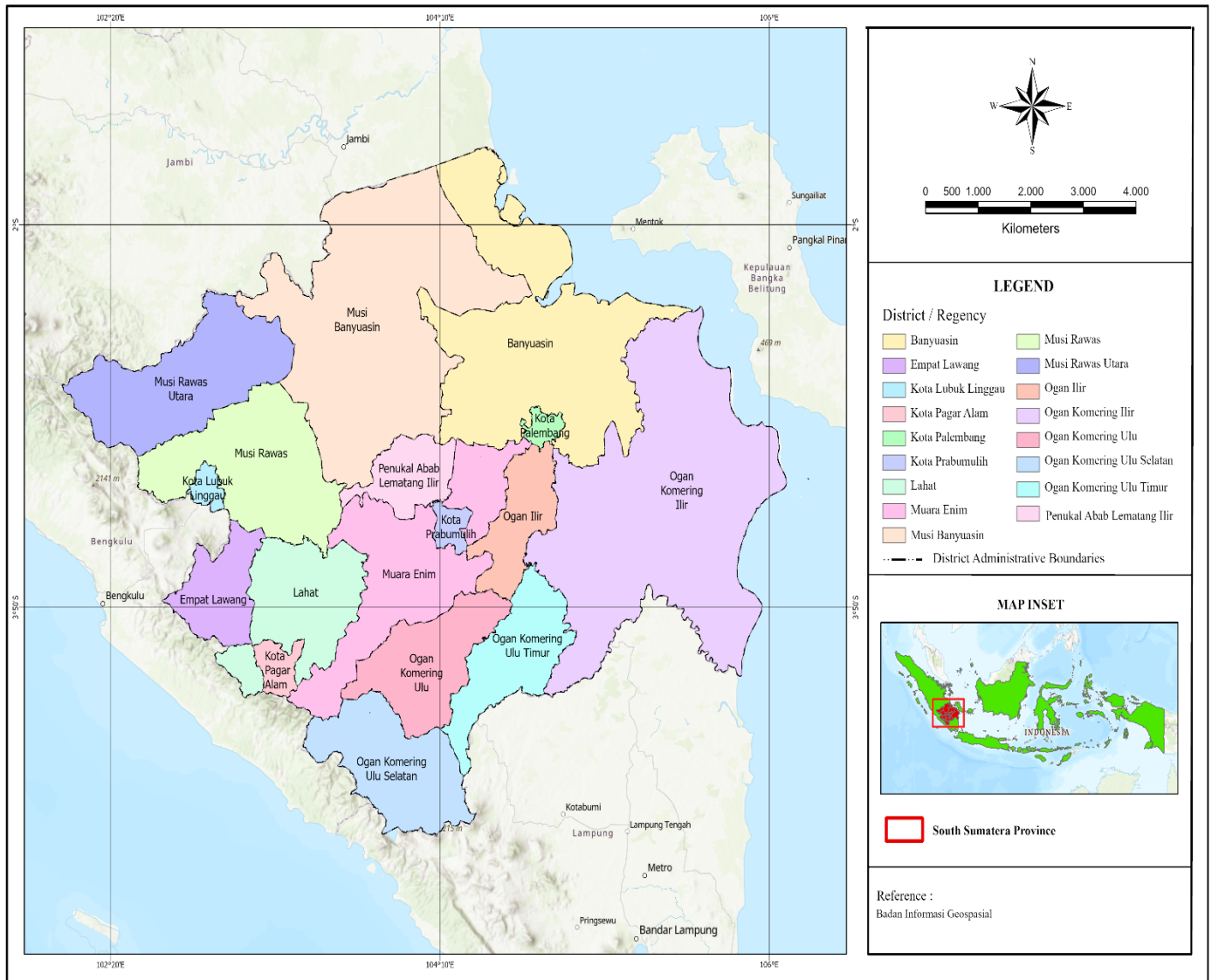


Figure 1. Map of South Sumatera, Indonesia

Table 2. Quantitative Strategic Planning Matrix (QSPM)

Stage 1 The Input Stage
External Factor Evaluation (EFE) Matrix
Competitive Profile Matrix (CPM)
Internal Factor Evaluation (IFE) Matrix
Stage 2 Matching Stage
Strengths Weakness Opportunities Threats (SWOT) Matrix
Strategic Position and Action Evaluation (SPACE) Matrix
Boston Consulting Group (BCG) Matrix
Internal-External (IE) Matrix
Grand Strategic Matrix
Stage 3 The Decision Stage

Source: [16]

In formulation and strategic selection, the two processes of analysis, namely SWOT analysis and QSPM analysis, are interrelated. The QSPM matrix analysis is used as a device for planning techniques dependent on inside and outside assessment and SWOT analysis, as well as completing shortcomings in the SWOT analysis process by increasing the likelihood that the last vital decision will be the best decision to be implemented [17].

3. RESULTS

3.1 SWOT analysis

The matching stage matrix we use in this research is derived from Strength-Weakness-Opportunities-Threats (SWOT) analysis. SWOT examination is a technique for an investigation that is completed by distinguishing the qualities, shortcomings, openings, and dangers of an association or issues and arrangements to accomplish an objective or accomplish a basic leadership assessment of issues and strategies so a system can be produced and created by concentrating on its qualities, limit dangers, take the best reasonable profit by circumstances accessible to the association, and use it to protect against dangers [15]. Since the focal point of this exploration is on the supportability of the advancement of smallholders-oversaw oil palm manors deal, a SWOT Investigation is utilized to break down the vital administration. The way toward distinguishing internal factors in this examination was completed by recognizing information and sources from different works of writing identified with social manageability and oil palm estates. These interior and outside elements are then delegated being a piece of qualities, shortcomings, openings and dangers (Table 3).

Table 3. SWOT identification

Strength	Weakness
<p>Oil palm in Southeast Asia is prioritized as an industrial-scale plantation crop [18].</p> <p>From approximately 30% of the world's palm oil production, small-scale plantations in Indonesia and Malaysia contributed around 47% [12]. Independent local smallholders can expand the oil palm area faster than farmers who depend on the company because the more straightforward way farmers make an extended utilization of their palm oil estates [20].</p> <p>Local farmers may have more special dealing power from the efficient gathering, even though the number of potential purchasers for their harvests might be restricted [22].</p> <p>There are advantage on investment in the palm oil industry and money-related execution than administrative-driven mix from free smallholder [23].</p>	<p>Oil palm in Southeast Asia is prioritized as an industrial-scale plantation crop [18].</p> <p>The community's income and social inequality is caused by growing palm oil plantations [19].</p> <p>The decrease in water quality (related to health) or, on the other hand, loss of species that are significant for nearby vocations [21].</p> <p>There are some gaps in productivity result, planting practices, distribution systems, and sciences between small and industrial scales. It became a challenge for local communities to be able to survive in social, economic, and environmental sustainability.</p> <p>There are some challenges to independent smallholders who were transmigrated from different areas in extending palm oil area, as the farmers who come to Sumatra under official's transmigration program are allocated a plot of land; additional land must be purchased [20].</p>
<p>The knowledge of local communities who have been farming palm oil for generations becomes human capital. The community is used to doing work related to palm oil management within the smallholders scope.</p>	<p>Difficulties of the smallholders on meeting the standard of a certification systems [9-11], due to limited information, knowledge, and fulfilment of the cost of obtaining the certification [12].</p>
Opportunities	Threats
<p>Small smallholders began palm oil development under an administration bolstered by farmers conspire, which are regularly connected to government transmigration programs, incorporating the trading of families from thickly populated islands, for instance, Java, to islands with high populace densities such as Sumatra [24].</p> <p>Plantation companies must help various farmers build oil palm manors, sources of info and specialized help. Partaking farmers at least got land testaments for their plasma estate after the credit given for the expense of setting up manors have been paid [24].</p> <p>The government provides credit facilities to support oil palm smallholders in increasing their productivity.</p> <p>RSPO had set natural and social standards and criteria to which palm oil organizations must conform. The criteria additionally incorporate sourcing from smallholder manors.</p> <p>The Indonesian government has, at last, consented to hold up under the expenses brought about by free farmers for acquiring Indonesia Sustainable Palm Oil (ISPO) confirmation before the end of 2019. The confirmation framework is required to shield Indonesia's palm oil industry from constant negative battling by shippers of the ware.</p> <p>RSPO backs smallholders through a wide range of approaches, for example, subsidizing through the RSPO Smallholder Support Fund (RSSF).</p> <p>RSPO encourages smallholders' confirmation using the advancement of 'Direction for Gathering Affirmation of FFB Production'.</p>	<p>There are unclear and unprofitable requirements of palm oil value chain and local population movements that caused oil palm smallholders powerless against control by organizations and government authorities.</p> <p>Uncertain legal, regulatory, and overlapping policies caused obstacles to local communities on achieving their socioeconomic needs from palm oil plantation sector [2, 5].</p> <p>Certification systems such as RSPO can be said to neglect to incorporate all partners similarly, prompting auxiliary and vital races concerning estate laborer's, smallholders, and indigenous people groups [25].</p> <p>Local farmers who do not have land documents are most likely recognized as illegal landowners [2].</p> <p>An imbalances in distribution, economics, and power almost always prevent large profits from farmers [26]. This imbalance caused by the possession of mills can control the market price of palm oil products.</p> <p>The inconsistency and informal legal process, which is a mix of covering authority, frail institutional limit, defilement, and absence of approvals when guidelines are damaged [2].</p> <p>There is hostility toward the palm oil campaign and obligation on Indonesian palm oil subordinates caused by supposed unfair endowments. These problems caused the EU to blame palm oil for presenting dangers toward deforestation.</p> <p>Free, Prior, and Informed Consent (FPIC) activities were not carried out well by the larger companies for local smallholders with minimal knowledge.</p>

Once the alternative strategies were determined, considering the qualities and shortcomings of internal and external factors, a Quantitative Strategic Planning Matrix (QSPM) was used as the analytical method to compare these alternative strategies. Assigning any inside and outside components recognized in the SWOT analysis process is not mandatory. However, if the SWOT analysis process will be continued with the QSPM analysis process, it is necessary to assess the weighting of scores on each factor [27]. Therefore, in this study, due to the QSPM analysis process will be carried out, we provide an assessment based on questionnaires and interviews that have been conducted. The alternative with the

highest score was selected as Indonesia's most feasible strategy for managing watershed policy. The QSPM method uses a self-judgment principle, where each alternative is rated based on its weight and significance.

The SWOT strategy matrix process will produce four types of strategies with the description of the four-cell strategies that are strategies generated from a match of Strength-Opportunity (SO), Weakness-Opportunity (WO), Strength-Threat (ST), and Weakness-Threat (WT) (Table 4) [27]. The weight of each alternative was defined by the predicted size of the effect of these exercises; the bigger the impact of a given alternative, the higher the weight. Next, the significance rating was scored

based on the possibility of its implementation, judged according to how specific, measurable, attainable, relevant, and timely its realization. The significance rating was scored from 0 to 4, where 0 = not relevant, 1 = not acceptable, 2 = possibly acceptable, 3 = probably acceptable, and 4 = most acceptable. Finally, the final score for both SO-ST and WO-WT alternatives were compared to establish a higher score. Next, activities with a higher total score (> 0.50) were selected as the most appropriate strategy or strategies for implementation. Those strategies with the highest scores could inform improvements to Indonesian watershed management policy.

The outcomes from SWOT mapping can be utilized as references to planning the board as the procedure draws near. The SWOT analysis process will then be continued with the Strategy SWOT process, which will be arranged in a SWOT

strategy matrix (Table 3). Stages Analysis of the SWOT strategy is one of the analyzes of the matching stages in the strategy formulation process [16]. The four strategies produced can be used for the sustainable social development of community-scale oil palm plantations. The SO match strategy is categorized as an aggressive strategy because the strategy used is a strategy that can utilize internal strength to get the maximum benefit from external opportunities and the WO strategy is a review strategy in which this strategy will be a strategy aimed at minimizing funds to correct weaknesses, as well as making the most of the external opportunities [15, 27, 28]. The ST strategy is a category of diversification strategy because it uses internal power to avoid or minimize external threats. The WT strategy is defensive because it aims to reduce internal weaknesses and avoid external threats [27, 28].

Table 4. Inter-factor interaction mapping for Indonesian smallholder palm oil plantation sustainable development strategy

Internal Factors	Strength	Weakness
External Factors	SO strategy	WO strategy
Opportunities	<p>Promoting the support of smallholder-sourced palm oil to the market as social added value.</p> <p>Oil palm companies source more from smallholder plantations, which are beneficial for their social value, thus increasing market preference.</p> <p>Oil palm companies are sharing knowledge, training, and assisting smallholders in managing sustainable oil palm plantations.</p> <p>RSPO and ISPO to accommodate the easiness of the administrative system in providing credit, inputs and technical assistance.</p> <p>The government imposed a tax program for large oil palm companies. Then the funds were allocated to develop smallholder farmers.</p> <p>Accelerate the ratification of funding regulations for ISPO certification for independent farmers in Indonesia.</p>	<p>The government simplifies bureaucratic and administrative requirements to accommodate the participating farmers with land certificates for their plasma plantations.</p> <p>Recruit more local workers to lessen the economic and social inequality in the community.</p> <p>RSPO and ISPO simplify the principles and conditions for smallholder farmers.</p>
Threats	<p>To socialize the difference in the price of sustainable palm oil compared to ordinary palm oil to smallholders since they have contributed to the total production.</p> <p>Urge importers to buy sustainable palm oil as a sustainable energy solution by showing evidence of improving the welfare of smallholders after meeting the principles and requirements of RSPO and ISPO certification.</p>	<p>The palm oil regulation for smallholders is expected to reduce the possibility of manipulation by companies and government officials.</p> <p>The Government of Indonesia expands the “<i>Land Agraria</i>” program (legalization of assets, redistribution of land and social forestry) for palm oil smallholders to improve welfare by recognizing private, state and public land rights that are used to meet the interests of the community.</p>

3.2 Quantitative Strategic Planning Matrix (QSPM) analysis

QSPM analysis helps to meet the shortcomings of the SWOT analysis, namely determining the relative importance of the inner and outer components that have been recognized and the overall engaging quality of every system for the inward and outside variables generated. The benefit of using QSPM analysis is that it systematically evaluates the internal and external factors. It has benefits that help decision or problem-solving processes related to environmental threats [27]. These strategies are prepared to address the root causes of conflicts in palm oil smallholder development by promoting collaboration, local empowerment, and equitable access to

resources, ultimately contributing to sustainable agriculture and community well-being.

The Inter-Factor Interaction Mapping for Indonesian Smallholder Palm Oil Plantation Management Strategy in Table 3 resulted in 13 alternative strategies (6 SO, 2 ST, 3 WO, and 2 WT). In order to decide on the most feasible of the 13 alternative strategies, a QSPM method is used to compare the different strategy options identified in the SWOT Matrix. The strategy alternatives in Table 3 are evaluated, judged, and rated based on their significance and likelihood of implementation. The QSPM matrix and rating of the SO-ST-based strategy analysis are shown in Table 5, and the WO-WT-based strategy analysis is shown in Table 6.

Table 5. Matrix of SO-ST alternatives for smallholder palm oil plantation sustainable development strategy in Indonesia

SO		Weight	Sig.	Total
1SO	Promoting the support of smallholder-sourced palm oil to the market as social added value.	0.10	2	0.20
2SO	Oil palm companies source more from smallholder plantations, which are beneficial for their social value, thus increasing market preference.	0.10	3	0.30
3SO	Oil palm companies are sharing knowledge, training, and assisting smallholders in managing sustainable oil palm plantations.	0.15	4	0.60
4SO	RSPO and ISPO to accommodate the easiness of the administrative system in providing credit, inputs, and technical assistance.	0.10	1	0.10
5SO	The government imposed a tax program for large oil palm companies; the funds were allocated to develop smallholder farmers.	0.10	4	0.40
6SO	Accelerate the ratification of funding regulations for ISPO certification for independent farmers in Indonesia.	0.15	1	0.15
ST		Weight	Sig.	Total
1ST	Socializing the difference in the price of sustainable palm oil compared to ordinary palm oil to smallholders since they have contributed to the total production	0.20	2	0.40
2ST	Urging importers to buy sustainable palm oil as a sustainable energy solution by showing evidence of improving the welfare of smallholders after meeting the principles and requirements of RSPO and ISPO certification.	0.10	2	0.20
Total		1.00		2.35

Notes: (Significance Rating Score (sig.): 0 - not relevant; 1 = not acceptable; 2 = possibly acceptable; 3= probably acceptable; 4 = most acceptable)

Table 6. Matrix of WO-WT alternatives for smallholder palm oil plantation sustainable development strategy in Indonesia

WO		Weight	Sig.	Total
1WO	The government simplifies bureaucratic and administrative requirements to accommodate the participating farmers with land certificates for their plasma plantations.	0.25	1	0.25
2WO	Recruiting more local workers to lessen the economic and social inequality in the community.	0.30	3	0.90
3WO	RSPO and ISPO simplify the principles and conditions for smallholder farmers.	0.15	2	0.30
WT		Weight	Sig.	Total
1WT	Regular knowledge sharing and literacy, the palm oil regulation for smallholders is expected to reduce the possibility of manipulation by companies and government officials.	0.10	3	0.30
2WT	The Government of Indonesia expands the land reform program (legalization of assets, redistribution of land and social forestry) for palm oil smallholders to improve welfare by recognizing private, state and public land rights that are used to meet the community's interests.	0.20	3	0.60
Total		1.00		2.35

Notes: (Significance Rating Score (sig.): 0 - not relevant; 1 = not acceptable; 2 = possibly acceptable; 3= probably acceptable; 4 = most acceptable)

Established on an examination of comparisons and scoring in Tables 3 and 4, proposed SO-ST-based alternative strategies (Total score = 2.35) score the same as proposed WO-WT strategies (Total score = 2.35). Suggests that both SO-ST and WO-WT strategies are suitable for implementation in Indonesia. However, when considering the most implementable and significant alternatives, only strategies with a total value of 0.50 or higher are considered relevant (the rows with blue highlights), as the impact of implementing these strategies is higher compared to other strategies. Only one strategy from SO-ST Matrix (Table 4) passed the criteria of total value > 0.50 for respective strategy alternatives, which is for oil palm companies conducting knowledge sharing, training, and assistance for smallholders in managing sustainable oil palm plantations [3SO, =0.60]. Furthermore, there are two strategies from WO-WT Matrix (Table 5) that passed the criteria, namely: 1. To recruit more local workers to lessen the economic and social inequality in the community [2WO, = 0.90] and 2. The Government of Indonesia expands the land reform or *reforma agraria*/land reform program (legalization of assets, redistribution of land and social forestry) for palm oil smallholders to improve welfare by recognizing private, state and public land rights that are used to meet the interests of the community [2WT, = 0.60]. Other alternative strategies are eliminated because they have a value below 0.5, which is not considered impossible to implement. The purpose of elimination is to make determining chosen strategies more efficient.

4. DISCUSSION

The three proposed strategies [3SO, 2WO, and 2WT] are considered implementable due to their specificity, measurability, attainability, relevance, and timeliness. Implementing these strategies shall be based on the largest to most miniature score or adapted to the specific area's condition. It is essential to understand that the proposed strategies must be discussed before implementation.

The 3SO strategy can bolster the expanded profitability of smallholder oil palm cultivating and empower supportable smallholder oil palm farmers. The smallholders are lacking information on how markets work, the job of affiliations, and their budgetary circumstances [29]. For instance, smallholders typically apply synthetic compounds and composts from over-the-top estates, and they may likewise need information on naturally neighborly farming practices. This lack might be a primary reason for fundamental and sizeable low profitability, which undermines the financial and natural supportability of the smallholder part [30]. The information shows that the absence of information on smallholder farmers is because the absence of preparation brings about a hole of existing and past experience. However, it should be noted that when designing and targeting intervention, smallholders should be looking at their socioeconomic [31]. The way toward sharing, preparing, and helping with the administration of oil palm estates should be possible through an organizational procedure between the oil palm organization and the smallholder palm oil network. In

the process, the organization or commitment procedure can be started from the network (base-up) or the organization (top-down); the inception procedure can be founded on a specific inspiration or consolation [32]. Uncovered the New Request system, there was a plan in which estate organizations created smallholder manors and gave input, specialized help, and money [2]. Toward the finish of the administration, ranch organizations never again ensured business advances to the smallholders. Until now, numerous organizations still neglect to accomplish the 'one-stop the executives' commitment, where estate organizations help oversee smallholder farmers [33]. As the oil palm market in Indonesia matures and its infrastructure strengthens, it is anticipated that an increasing number of smallholders will become capable of independently producing palm oil. However, disappointments arise due to the lack of practical support for the expansion of smallholder oil palm farming, often necessitating reliance on available land and inputs from larger estates. It is strongly recommended that bigger palm oil players can prioritize the facilitation of smallholder support mechanisms encompassing knowledge transfer, training initiatives, and ongoing assistance. The promotion of sustainable farming practices among smallholders is pivotal in curbing adverse environmental repercussions, notably deforestation and biodiversity depletion, thereby fostering a paradigm shift towards environmentally conscientious palm oil production practices.

The 2WO strategy suggests to gradually hiring local workers to reduce economic and social disparities within the community. Palm oil requires less labor compared to other crops, such as rubber, allowing farmers to manage a larger area with a specific number of workers [19]. However, in most cases, labor requirements on oil palm plantations are minimal. There is a perception that migrant workers are more likely to be hired on a daily basis than casual or local laborers, often perpetuating ethnic stereotypes about 'lazy indigenous people', resulting in few locals being employed. [34]. Consequently, many residents in plantation areas lack job opportunities or lose access as they age due to an increasing pool of potential workers with each new generation [34]. Therefore, expanding the recruitment of local individuals as workers in oil palm plantation areas will enhance the social and economic well-being of the local population, preventing those who have lost their land from falling into poverty due to unemployment. Additionally, the recruitment of local workers and resettled landless farmers has provided ample employment opportunities for residents and alleviated poverty [35].

The 2WT strategy recommends the Indonesian government to grow the "Agrarian Reformation" or land reform program (including resource legalization, land redistribution, and social forestry) for oil palm smallholders to enhance welfare by recognizing private, state, and public land rights used to fulfill community interests. Providing land certificates to smallholders can further improve their access to credit, increase yields, profits, and standards of living, and reduce forest encroachment [36]. Land reform programs also contribute to making palm oil production more environmentally sustainable and can enhance the welfare of local communities [37]. Adhering to the principles of agrarian reform, equitable access to productive resources and economic opportunities from profitable land use must be provided to impoverished individuals [38].

There are various approaches to oil palm production among smallholders, including independent production, cooperative associations, and government assistance programs, which are

generally viewed positively by smallholders [29]. Different production methods yield different outcomes in terms of debt burden, reliance on reliable sources for information, plant diversity, and employment opportunities, all of which impact the economic sustainability of oil palm cultivation for smallholders [29]. Inclusion of smallholders in palm oil production can enhance community yields and incomes, with increasing support for adopting more sustainable practices aligned with RSPO standards and criteria. Certifications like RSPO can play a crucial role by encouraging smallholders to adopt sustainable practices, promoting fair profit-sharing, and strengthening their positions in decision-making processes. Producer associations are instrumental in improving communication and inclusivity in value chains [39]. However, these certifications should also address the social impacts of palm oil plantations, as they tend to focus more on environmental aspects, requiring government intervention [40, 41]. Nevertheless, smallholders still need to strengthen their collective action to influence the global supply chain, necessitating greater involvement from larger palm oil companies to act as advocates and partners for smallholders, creating conditions for sustainable oil palm plantations.

5. CONCLUSION

Palm oil is a very prospective industry in Indonesia, and smallholders are a significant contributor to the potential support of the palm oil industry. Nevertheless, as oil palm smallholders, they are often faced with problems such as profit management, productivity, legality, and sustainability. The study of smallholder palm oil plantation sustainable development in Indonesia provides three implementable alternative strategies and recommendations for the consideration of the related stakeholders, namely: palm oil smallholders as primary stakeholders, the Indonesian Government and palm oil certification NGOs (RSPO, ISPO, ISCC) as policymakers, and larger palm oil companies that act as patron and partner to the smallholders. The three strategies consist of one strategy based on the SO-ST matrix and two based on the WO-WT matrix. This study contributes to the field of sustainable agriculture and planning by proposing novel strategies for palm oil smallholder development: 1). Collaborative efforts between oil palm companies and smallholders to share knowledge and training for sustainable plantation management; 2). Implementing initiatives to recruit local workers, aiming to mitigate economic and social inequality within communities; and 3). Advocating for expanded land reform programs by the Government of Indonesia, including the legalization of assets, redistribution of land, and social forestry, to improve smallholders' welfare and recognize diverse land rights, thereby aligning with community interests.

It is strongly recommended that palm oil companies prioritize assisting smallholders through knowledge sharing, training, and support to promote sustainable farming practices, mitigate environmental impacts, and advocate for the expansion of Indonesia's land reform program by the government, as these strategies have demonstrated substantial potential for fostering sustainable development, reducing inequality, and improving welfare within the palm oil industry and local communities.

Further study is necessary to examine how the implementation of alternative strategies in the palm oil

industry can be tailored to the specific conditions and needs of smallholder farmers, while also considering the terms set forth by policymakers and patrons.

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REFERENCES

- [1] Badan Pusat Statistik. (2018). Statistik kelapa sawit Indonesia 2018. Badan Pusat Statistik, Jakarta. <https://www.bps.go.id/publication/2019/11/22/1bc09b8c5de4dc77387c2a4b/statistik-kelapa-sawit-indonesia-2018.html>, accessed on Jul. 21, 2023.
- [2] Jelsma, I., Schoneveld, G.C., Zoomers, A., van Westen, A.C.M. (2017). Unpacking Indonesia's independent oil palm smallholders: An actor-disaggregated approach to identifying environmental and social performance challenges. *Land Use Policy*, 69: 281-297. <https://doi.org/10.1016/j.landusepol.2017.08.012>
- [3] RSPO. (2019). RSPO Independent Smallholder Standard. https://rspo.org/library/lib_files/preview/1127, accessed on Aug. 20, 2023.
- [4] Azhar, B., Saadun, N., Prideaux, M., Lindenmayer, D.B. (2017). The global palm oil sector must change to save biodiversity and improve food security in the tropics. *Journal of Environmental Management*, 203: 457-466. <https://doi.org/10.1016/j.jenvman.2017.08.021>
- [5] Naylor, R.L., Higgins, M.M., Edwards, R.B., Falcon, W.P. (2019). Decentralization and the environment: Assessing smallholder oil palm development in Indonesia. *Ambio*, 48: 1195-1208. <https://doi.org/10.1007/s13280-018-1135-7>
- [6] Euler, M., Hoffmann, M.P., Fathoni, Z., Schwarze, S. (2016). Exploring yield gaps in smallholder oil palm production systems in eastern Sumatra, Indonesia. *Agricultural Systems*, 146: 111-119. <https://doi.org/10.1016/j.agsy.2016.04.007>
- [7] Nugroho, C.B.T., Permatasari, P., Anantanyu, S. (2023). Analisis faktor dan persepsi pemuda desa terhadap pekerjaan petani. *Journal of Agrosociology and Sustainability*, 1(1): 31-43. <https://doi.org/10.61511/jassu.v1i1.2023.58>
- [8] Woittiez, L.S., van Wijk, M.T., Slingerland, M., van Noordwijk, M., Giller, K.E. (2017). Yield gaps in oil palm: A quantitative review of contributing factors. *European Journal of Agronomy*, 83: 57-77. <https://doi.org/10.1016/j.eja.2016.11.002>
- [9] Pirker, J., Mosnier, A., Kraxner, F., Havlík, P., Obersteiner, M. (2016). What are the limits to oil palm expansion? *Global Environmental Change*, 40: 73-81. <https://doi.org/10.1016/j.gloenvcha.2016.06.007>
- [10] Hidayat, N.K., Offermans, A., Glasbergen, P. (2018). Sustainable palm oil as a public responsibility? On the governance capacity of Indonesian Standard for Sustainable Palm Oil (ISPO). *Agriculture and Human Values*, 35(1): 223-242. <https://doi.org/10.1007/s10460-017-9816-6>
- [11] Craw, M. (2019). Palm oil smallholders and land-use change in Indonesia and Malaysia: Implications for the draft EU delegated act of the recast renewable energy directive. <https://www.regnskog.no/en/news/palm-oil-smallholders-and-land-use-change-in-indonesia-and-malaysia>, accessed on Jan. 19, 2023.
- [12] Saadun, N., Lim, E.A.L., Esa, S.M., Ngu, F., Awang, F., Gimin, A., Johari, I.H., Firdaus, M.A., Wagimin, N.I., Azhar, B. (2018). Socio-ecological perspectives of engaging smallholders in environmental-friendly palm oil certification schemes. *Land Use Policy*, 72: 333-340. <https://doi.org/10.1016/j.landusepol.2017.12.057>
- [13] Jelsma, I., Slingerland, M., Giller, K.E., Bijman, J. (2017). Collective action in a smallholder oil palm production system in Indonesia: The key to sustainable and inclusive smallholder palm oil? *Journal of Rural Studies*, 54: 198-210. <https://doi.org/10.1016/j.jrurstud.2017.06.005>
- [14] Shafieyan, M., Homayounfar, M., Fadaei, M. (2017). Identification of Strategies for sustainable development of rice production in Guilan Province using SWOT analysis. *International Journal of Agricultural Management and Development*, 7(2): 141-153.
- [15] Ghorbani, A., Raufirad, V., Rafiaani, P., Azadi, H. (2015). Ecotourism sustainable development strategies using SWOT and QSPM model: A case study of Kaji Namakzar Wetland, South Khorasan Province, Iran. *Tourism Management Perspectives*, 16: 290-297. <https://doi.org/10.1016/j.tmp.2015.09.005>
- [16] Rozy, F., Aliyudin, M., Mirna, S., Ayu, R. (2023). Handling of area impact of land exploitation in the Kendeng Mountain, Pati District, Central Java. *Calamity: A Journal of Disaster Technology and Engineering*, 1(1): 33-40. <https://doi.org/10.61511/calamity.v1i1.2023.132>
- [17] Shri, C., Gupta, M., Agrawal, A. (2015). Strategy formulation for performance improvement of Indian corrugated industry: An application of SWOT analysis and QSPM matrix. *Journal of Applied Packaging Research*, 7(3): 60-75.
- [18] Arista, N.I.D., Alifia, A.D., Mubarak, H., Arta, I.M.S.D., Rizva, D.N., Wicaksono, A.I. (2023). Availability and potential for expansion of agricultural land in Indonesia. *Journal of Sustainability, Society, and Eco-Welfare*, 1(1): 1-16. <https://doi.org/10.61511/jssew.v1i1.2023.242>
- [19] Euler, M., Krishna, V., Schwarze, S., Siregar, H., Qaim, M. (2017). Oil palm adoption, household welfare, and nutrition among smallholder farmers in Indonesia. *World Development*, 93: 219-235. <https://doi.org/10.1016/j.worlddev.2016.12.019>
- [20] Euler, M., Schwarze, S., Siregar, H., Qaim, M. (2016). Oil palm expansion among smallholder farmers in Sumatra, Indonesia. *Journal of Agricultural Economics*, 67(3): 658-676. <https://doi.org/10.1111/1477-9552.12163>
- [21] Moreno-Peñaranda, R., Gasparatos, A., Stromberg, P., Suwa, A., Pandyaswargo, A.H., Puppim de Oliveira, J.A. (2015). Sustainable production and consumption of palm oil in Indonesia: What can stakeholder perceptions offer

- to the debate? *Sustainable Production and Consumption*, 4: 16-35. <https://doi.org/10.1016/j.spc.2015.10.002>
- [22] Nagiah, C., Azmi, R. (2012). A Review of smallholder oil palm production: Challenges and opportunities for enhancing sustainability- A Malaysian perspective. *Journal of Oil Palm and the Environment*, 3: 114-120. <https://doi.org/10.5366/jope.2012.12>
- [23] Cooke, F.M., Toh, S., Vaz, J. (2011). Community-Investor Business Models: LESSONS from the Oil Palm Sector in East Malaysia. International Fund for Agricultural Development (IFAD) Report.
- [24] McCarthy, J.F., Cramb, R.A. (2009). Policy narratives, landholder engagement, and oil palm expansion on the Malaysian and Indonesian frontiers. *The Geographical Journal*, 175(2): 112-123. <https://doi.org/10.1111/j.1475-4959.2009.00322.x>
- [25] Pichler, M. (2013). "People, planet & profit": Consumer-oriented hegemony and power relations in palm oil and agrofuel certification. *The Journal of Environment & Development*, 22(4): 370-390. <https://doi.org/10.1177/1070496513502967>
- [26] Pye, O. (2019). Commodifying sustainability: Development, nature and politics in the palm oil industry. *World Development*, 121: 218-228. <https://doi.org/10.1016/j.worlddev.2018.02.014>
- [27] David, M.E., David, F.R., David, F.R. (2017). The quantitative strategic planning matrix: A new marketing tool. *Journal of Strategic Marketing*, 25(4): 342-352. <https://doi.org/10.1080/0965254X.2016.1148763>
- [28] Pazouki, M., Jozi, S.A., Ziari, Y.A. (2017). Strategic management in urban environment using SWOT and QSPM model. *Global Journal of Environmental Science and Management*, 3(2): 207-216. <https://doi.org/10.22034/gjesm.2017.03.02.009>
- [29] Bennett, A., Ravikumar, A., McDermott, C., Malhi, Y. (2019). Smallholder oil palm production in the Peruvian Amazon: Rethinking the promise of associations and partnerships for economically sustainable livelihoods. *Frontiers in Forests and Global Change*, 2: 14. <https://doi.org/10.3389/ffgc.2019.00014>
- [30] Woittiez, L.S., Turhina, S.R. I., Deccy, D., Slingerland, M., Van Noordwijk, M., Giller, K.E.N.E. (2019). Fertiliser application practices and nutrient deficiencies in smallholder oil palm plantations in Indonesia. *Experimental Agriculture*, 55(4): 543-559. <https://doi.org/10.1017/S0014479718000182>
- [31] Schoneveld, G.C., van der Haar, S., Ekowati, D., Andrianto, A., Komarudin, H., Okarda, B., Jelsma, I., Pacheco, P. (2019). Certification, good agricultural practice and smallholder heterogeneity: Differentiated pathways for resolving compliance gaps in the Indonesian oil palm sector. *Global Environmental Change*, 57: 101933. <https://doi.org/10.1016/j.gloenvcha.2019.101933>
- [32] Reed, M.S., Vella, S., Challies, E., de Vente, J., Frewer, L., Hohenwallner-Ries, D., Huber, T., Neuman, R.K., Oughton, E.A., del Ceno, J.S., van Delden, H. (2018). A theory of participation: What makes stakeholder and public engagement in environmental management work? *Restoration Ecology*, 26(S1): S7-S17. <https://doi.org/10.1111/rec.12541>
- [33] Cramb, R., McCarthy, J.F. (2016). The Oil Palm Complex: Smallholders, Agribusiness and the State in Indonesia and Malaysia. NUS Press. <https://doi.org/10.2307/j.ctv1xz0km>
- [34] Li, T.M. (2017). Intergenerational displacement in Indonesia's oil palm plantation zone. *The Journal of Peasant Studies*, 44(6): 1158-1176. <https://doi.org/10.1080/03066150.2017.1308353>
- [35] Sakinah, R., Surtikanti, H. K. (2024). Upaya pelestarian pertanian oleh masyarakat dayak Meratus berbasis kearifan lokal manugal: Studi literatur. *Journal of Socio-Cultural Sustainability and Resilience*, 1(2): 119-126. <https://doi.org/10.61511/jscsr.v1i2.2024.427>
- [36] Krishna, V., Euler, M., Siregar, H., Qaim, M. (2017). Differential livelihood impacts of oil palm expansion in Indonesia. *Agricultural Economics*, 48(5): 639-653. <https://doi.org/10.1111/agec.12363>
- [37] Purnomo, H., Okarda, B., Dewayani, A.A., Ali, M., Achdiawan, R., Kartodihardjo, H., Pacheco, P., Juniawaty, K.S. (2018). Reducing forest and land fires through good palm oil value chain governance. *Forest Policy and Economics*, 91: 94-106. <https://doi.org/10.1016/j.forpol.2017.12.014>
- [38] Dhiaulhaq, A., McCarthy, J.F. (2020). Indigenous rights and agrarian justice framings in forest land conflicts in Indonesia. *The Asia Pacific Journal of Anthropology*, 21(1): 34-54. <https://doi.org/10.1080/14442213.2019.1670243>
- [39] Sihalo, A.P.R. (2023). Mutuality of being in the bataktoba community: Exploring the maingain tradition in the modern era. *Journal of Earth Kingdom*, 1(1): 38-47. <https://doi.org/10.61511/jek.v1i1.2023.34>
- [40] Ayompe, L.M., Schaafsma, M., Egoh, B.N. (2021). Towards sustainable palm oil production: The positive and negative impacts on ecosystem services and human wellbeing. *Journal of Cleaner Production*, 278: 123914. <https://doi.org/10.1016/j.jclepro.2020.123914>
- [41] Pramudya, E.P., Wibowo, L.R., Nurfatriani, F., Nawireja, I.K., Kurniasari, D.R., Hutabarat, S., Kadarusman, Y.B., Iswardhani, A.O., Rafik, R. (2022). Incentives for palm oil smallholders in mandatory certification in Indonesia. *Land*, 11(4): 576. <https://doi.org/10.3390/land11040576>