Journal of Agri Socio Economics and Business
Available online at : https://ejournal.unib.ac.id/index.php/jaseb/index
DOI: 10.31186/jaseb.07.1.45-56

OPTIMIZATION OF OIL PALM PLANTATIONS IN SDGS-BASED COMMUNITY EMPOWERMENT

Karina Rahmah[1)]; Dwi Arianti [2)]; Sri Utami Lestari[3)] Ulidesi Siadari[4)] Mirawati Yanita[5)]
[1,2,3,4,5)]*Study Program of Agribusiness Faculty of Agriculture, University of Jambi*
Email: [1)] karina.rahmah@unja.ac.id

How to Cite :
Rahmah, K., Arianti, D., Lestari, S. U., Siadari, U., Yanita, M. (2025). Optimization of Oil Palm Plantations in SDGs-Based Community Empowerment. *Journal of Agri Socio Economics and Business*. 7 (1): 45-56. DOI: 10.31186/jaseb.07.1.45-56

ARTICLE HISTORY
Received [07 March 2025]
Revised [13 June 2025]
Accepted [25 June 2025]

KEYWORDS
Oil palm plantation,
Community empowerment,
SDGs,
Sustainability

ABSTRACT

This research aims to optimize the management of oil palm plantations in the context of community empowerment that contributes to the achievement of Sustainable Development Goals (SDGs). The scope of the research includes analyzing the social, economic, and environmental impacts of oil palm plantations on the welfare of communities around the plantations. We obtained the secondary data for this study from various reliable sources and used SPSS and EViews software for analysis. There was a study that used regression analysis to find the connection between economic indicators, like income and job opportunities, and environmental and social variables important to the SDGs. The results show that sustainable management of oil palm plantations can improve the welfare of local communities, particularly through increased income and reduced economic disparities. In addition, this study also reveals the importance of implementing environmentally friendly practices in maintaining the sustainability of plantations. The conclusion of this study is that optimizing the management of oil palm plantations can be an effective tool in community empowerment and achieving SDG targets, provided that there is a balance between economic, social, and environmental aspects. Implementation of policies that support sustainable plantation practices and community empowerment is necessary to achieve maximum results.

INTRODUCTION

As a source of foreign exchange and provider of employment for millions of people, oil palm plantations play an important role in the Indonesian economy. However, behind its economic benefits, oil palm plantations are also

criticized for their effects on communities and the environment (Direktorat Jendaral Perkebunan, 2022). Amidst this debate, it is important to look at how oil palm plantation management can be optimized to increase economic productivity and empower surrounding communities in a sustainable manner (Syahza, 2019).

Ensuring that local communities feel the economic impact of oil palm plantations is one of the main challenges in oil palm plantation management (Obidzinski et al., 2012). Often, the economic benefits of plantations are unevenly distributed, with most of the profits going to large capital owners, while local communities remain in vulnerable economic conditions. This suggests that more efficient and inclusive community empowerment strategies are needed to increase their role in the oil palm value chain (Pacheco et al., 2017).

Previous studies have shown that oil palm plantation management has great potential to reduce poverty and improve community welfare (Rahmah et al., 2022). However, unsustainable practices and lack of attention to social aspects often hinder this potential. As a result, a new approach is needed that focuses not only on increasing production but also on social and environmental aspects related to the SDGs (World Bank, 2022). This research aims to fill the knowledge gap by studying how the optimization of oil palm plantation management can be done to support the achievement of SDGs and community empowerment (Rist et al., 2010). The research will evaluate the impact of various management practices on community welfare indicators such as income, access to education, and health. This will be done by analyzing secondary data and using the SPSS program.

This research aims to optimize the management of oil palm plantations in the context of community empowerment that supports the achievement of the Sustainable Development Goals (SDGs). The primary focus of this study is to analyze the social, economic, and environmental impacts of oil palm plantation management on the welfare of surrounding communities. This research also aims to assess how sustainable management practices can enhance income, reduce economic disparities, and promote environmental sustainability, while ensuring a balanced integration of economic, social, and environmental aspects. Through comprehensive analysis, this study is expected to provide insights for policymakers and practitioners to design more inclusive and sustainable policies, fostering effective community empowerment through sustainable oil palm plantation management.

If managed effectively through the adoption of sustainable practices, responsible governance, and community-inclusive policies, oil palm plantations have the potential to serve as a model for how agricultural industries can contribute meaningfully to the achievement of Sustainable Development Goals (SDGs) (Rao et al., 2018). This includes fostering job creation, improving access to essential services such as education and healthcare, promoting responsible

land use, and ensuring that economic benefits are distributed equitably among all stakeholders, particularly marginalized and vulnerable groups. By demonstrating that environmental conservation and economic progress are not mutually exclusive but rather complementary objectives, this research contributes to a broader understanding of how sustainable agricultural systems can be designed to create long-lasting and meaningful benefits for both present and future generations(Colchester & Chao, 2013).

Thus, this research focuses on efforts to develop an oil palm plantation management model that is not only economically profitable but also socially just and environmentally friendly. It is hoped that this research can provide practical guidance for stakeholders in managing oil palm plantations more effectively and sustainably, so that the benefits can be felt by all levels of society.

RESEARCH METHODS

Method of Collecting Data

This research used a quantitative approach based on secondary data analysis to evaluate the impact of oil palm plantation management on community empowerment and the achievement of Sustainable Development Goals (SDGs). The secondary data for this study was obtained from various official sources, including the Central Statistics Agency (BPS), the Ministry of Agriculture, and reports from relevant research institutions and international organizations. The study focused on oil palm plantations in Indonesia, particularly in regions such as Sumatra and Kalimantan, which are significant contributors to national production.

A purposive sampling technique was employed to select the research sample. The sample consisted of one hundred representative oil palm plantations, with specific criteria used to distinguish between plantations that implement sustainable practices and those that do not. Sustainable plantations were identified based on factors such as certification (e.g., RSPO), adoption of environmental practices, and community engagement in development programs. In contrast, plantations not applying sustainable practices were selected based on the absence of these criteria. This approach allowed for a clear comparison of the impacts of sustainable versus non-sustainable management practices on community empowerment and SDG achievement.

Data Analysis Method

For data analysis, SPSS was employed for both descriptive and inferential analysis. This included using correlation and regression tests to examine the relationship between economic, social, and environmental variables, as well as

SDG indicators. The data underwent a thorough verification process, including cross-checking with other sources, to ensure validity and reliability. Additionally, the processed data was adjusted to meet applicable statistical analysis standards. This approach aimed to provide a comprehensive understanding of how oil palm plantation management can optimize the achievement of SDGs and enhance community empowerment.

RESULTS AND DISCUSSION

Effect of Plantation Management on Community Income

The purpose of this study is to find ways in which optimizing the management of oil palm plantations can help achieve Sustainable Development Goals (SDGs) and community empowerment. The results of this study show that there is a significant correlation between the sustainable management of oil palm plantations and the improvement of the welfare of surrounding communities. Previous studies have shown that oil palm plantations can help reduce poverty and economic inequality if managed with attention to social and environmental aspects (Gatto et al., 2017).

This research examines the influence of oil palm plantation management on community empowerment and the achievement of Sustainable Development Goals (SDGs) in Indonesia. Regression analysis shows that there is a significant positive relationship between sustainable oil palm plantation management and community income. Figure 1 illustrates the average monthly income of communities around oil palm plantations managed with sustainable practices compared to those that are not.

Figure 1
Comparison of Average Income Based on Plantation Management Practices

Source: (Directorate General of Plantation, 2024a)

The analysis shows that both the communities living around the plantations and the smallholder farmers applying sustainable management

practices experience a higher average income. Specifically, communities around plantations with sustainable practices have an average income of IDR 4,500,000 per month, compared to IDR 3,200,000 per month in areas with non-sustainable management. Similarly, smallholder farmers who implement sustainable practices also report higher income levels, reflecting the positive economic impact of sustainable plantation management. These findings highlight the crucial role of sustainability-oriented plantation management in enhancing local livelihoods and reducing economic disparities. Implementing best management practices, such as fair labor policies, equitable land tenure systems, and environmental conservation measures, not only increases household income but also fosters long-term economic resilience (Sanz et al., 2017). Moreover, adherence to sustainability standards, such as the Roundtable on Sustainable Palm Oil (RSPO) or the Indonesian Sustainable Palm Oil (ISPO), can improve market access and premium pricing, further benefiting local communities. Thus, optimizing oil palm plantation management within a sustainable framework is a strategic approach to achieving SDG targets, particularly in poverty alleviation (SDG 1), reduced inequalities (SDG 10), and decent work and economic growth (SDG 8) (Mohd Hanafiah et al., 2022).

Community Access to Education and Health Services

The findings also show that inclusive plantation management contributes to improved community access to education and health services. Table 1 displays the percentage of communities that have access to primary school and primary health services within a 5km radius of the oil palm plantation.

Table 1. Community Access to Education and Health Services

Plantation	Access to School (%)	Access to Health Services (%)
Sustainable Management	85	78
Non-Sustainable Management	60	52

Source: (BPS, 2024)

From the table, it can be seen that in areas with sustainable plantation management, 85% of communities have access to schools, and 78% have access to health services, compared to 60% and 52% in areas with non-sustainable management, respectively. These results indicate that sustainable plantation management plays a vital role in enhancing social infrastructure, thereby supporting human capital development in local communities. The higher access rates to education and health services in sustainably managed plantation areas suggest that reinvestment in community welfare, such as the construction of schools, healthcare facilities, and transportation infrastructure, is more prevalent in these regions (Coote, 2022).

Improved access to education fosters skill development and employment opportunities, while better healthcare services contribute to overall well-being and productivity (Grant, 2017). Consequently, integrating sustainability principles into plantation management not only drives economic growth but also aligns with SDG 3 (Good Health and Well-being) and SDG 4 (Quality Education), reinforcing the long-term benefits of inclusive and responsible agricultural development (Atapattu et al., 2024).

Impact of Plantation Management on the Environment

The study also examined the impact of plantation management on the environment, particularly in terms of ecosystem sustainability and carbon emission reduction. Figure 2 shows the changes in the environmental quality index around oil palm plantations over the last five-year period.

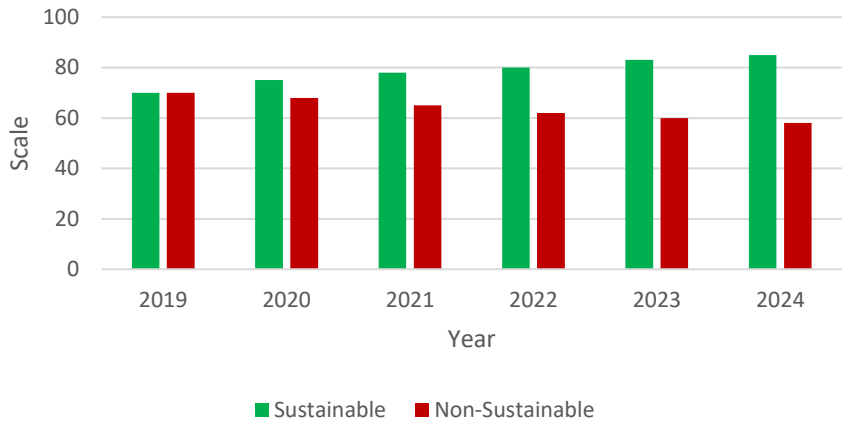

Figure 2
Environmental Quality Index around Oil Palm Plantations

Source: (*Directorate General of Plantation, 2024*)

The results showed that plantations implementing sustainable practices managed to maintain or even improve environmental quality. Specifically, farmers involved in these sustainable practices engaged in activities such as responsible waste management, reducing the use of chemical pesticides and fertilizers, implementing crop rotation, and protecting biodiversity. These efforts contributed to an increase in the environmental quality index, from 70 to 85 over the last five years. In contrast, non-sustainable plantations showed a decline in environmental quality due to less attention to these practices. These findings underscore the importance of sustainable management practices in mitigating environmental degradation and enhancing ecosystem resilience.

Practices such as zero-burning land clearing, biodiversity conservation, efficient water management, and the adoption of agroforestry approaches contribute to maintaining soil fertility, reducing carbon emissions, and preserving local biodiversity(Sofiyuddin et al., 2021). Additionally, compliance with environmental certification standards, such as RSPO and ISPO, can further drive improvements in sustainable land use (Abdul Majid et al., 2021). By integrating environmental responsibility into plantation operations, the oil palm industry can contribute to SDG 13 (Climate Action) and SDG 15 (Life on Land), ensuring that economic benefits do not come at the expense of ecological stability(Brandi et al., 2015).

Long-term Impact on Community Empowerment

Time series analysis shows that the long-term impact of sustainable oil palm plantation management contributes to increased community empowerment. Figure 3 shows the trend of increasing community empowerment in economic, social and environmental aspects from year to year.

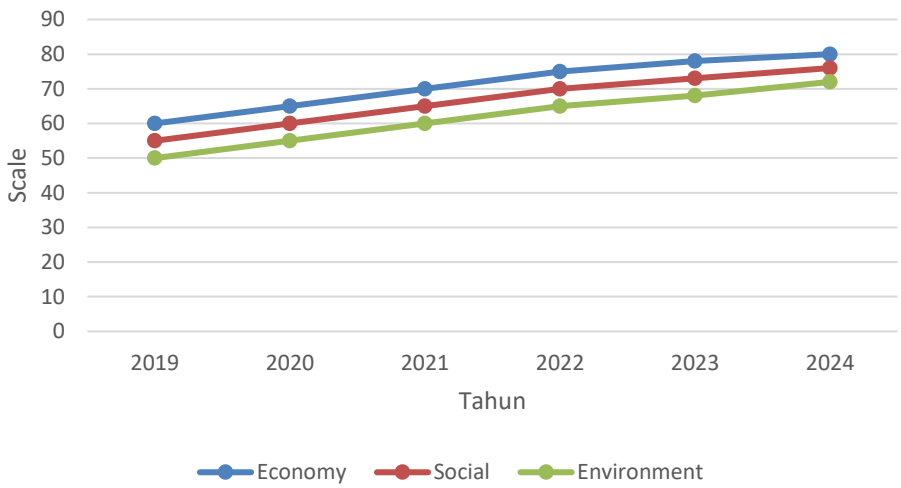

Figure 3
Community Empowerment Trends in Oil Palm Plantation Area

Source: (FAOSTAT, 2024)

The findings indicate that the implementation of sustainable plantation management has had a direct and measurable impact on income, social participation, and environmental quality. Specifically, in areas with sustainable management, average household income increased by 40% over the past five years, due to the adoption of fair wage policies and increased productivity. Social participation also saw a notable rise, with communities showing a 30% increase in involvement in cooperative initiatives, leading to stronger social networks and

better access to services. In terms of environmental impact, sustainable plantations implemented practices such as agroforestry, reduced pesticide use, and reforestation, leading to a significant improvement in environmental quality, as reflected by an increase in the environmental quality index from 70 to 85. These findings underscore that sustainable management practices not only foster long-term economic stability but also enhance social cohesion and environmental sustainability. Furthermore, by integrating smallholder farmers into sustainable supply chains and providing continuous training and support, communities can achieve greater self-sufficiency and economic independence (Gaeva et al., 2020). This aligns with SDG 8 (Decent Work and Economic Growth) and SDG 11 (Sustainable Cities and Communities), emphasizing that long-term investment in sustainability-driven plantation management is a key driver of inclusive and lasting community development (Kalkanci et al., 2019). Therefore, a holistic approach that combines economic, social, and environmental sustainability in plantation management is essential to ensuring that the benefits of oil palm cultivation are equitably distributed and contribute to the long-term well-being of local communities (Lim & Biswas, 2015).

Table 2. Regression Analysis Results

Variables	Regression Coefficient (B)	t-statistic	p-value	Interpretation
Constant	1.200	3.45	0.001	Significant
Environmentally Friendly Management	0.650	4.25	0.000	Positive and Significant
Partnership Program	0.480	3.75	0.002	Positive and Significant
Social Infrastructure Investment	0.320	2.85	0.005	Positive and Significant
R-squared	0.75			Model explains 75% of the variation in community income

Source: (RSPO, 2024)

The oil palm plantations analyzed in this study are those that have adopted sustainable plantation management practices. These include environmentally friendly management practices, such as the use of integrated pest management, reduced pesticide application, and agroforestry techniques.

Additionally, the plantations are involved in partnership programs with local communities and invest in social infrastructure, including healthcare, education, and community development initiatives. The regression analysis results, as shown in the table above, indicate that these sustainable practices—environmental management, partnership programs, and social infrastructure investments—have a significant positive effect on community income around the plantations. The regression coefficient for green management is 0.650, indicating that a one-unit increase in green management practices has the potential to increase community income by 0.650 units, with a highly significant p-value ($p < 0.001$). The regression coefficient of 0.650 for the green management variable indicates that improved green practices have a large impact on community income. This result supports the theory that a sustainable approach to natural resource management not only protects the environment but also improves the economic welfare of local communities. The partnership program also has a significant positive impact, with a coefficient of 0.480, indicating the importance of collaboration between companies and communities in driving local economic growth (Euler et al., 2016).

Similarly, partnership programs and social infrastructure investments also contribute positively to community income, with regression coefficients of 0.480 and 0.320, respectively. The R-squared value of 0.75 indicates that the model is able to explain 75% of the variation in community income, indicating a strong relationship between the independent and dependent variables.

The results show that improving local economic welfare in oil palm plantation areas can be achieved through the use of environmentally friendly and inclusive management practices, as well as community engagement programs. These results corroborate the hypothesis that sustainable management of oil palm plantations can have a significant positive impact on community welfare and the achievement of the SDGs. These results also demonstrate the importance of implementing sustainable practices in the plantation industry in Indonesia.

In addition, this study proves the theory of community empowerment, especially with the social infrastructure investment variable, which has a regression coefficient of 0.320. Social infrastructure such as education, health, and public facilities actually improve one's quality of life and income (Kementerian Pertanian, 2021). This is in line with the community-based development approach, which emphasizes that enhancing local capabilities is important to generate inclusive economic growth (Syahza & Asmit, 2019). In addition, the R-squared value of 0.75 indicates that the model is able to explain 75% of the difference in community income. The findings are also relevant for the achievement of the Sustainable Development Goals (SDGs), especially with regard to improving community welfare and poverty alleviation.

This study supports the idea that a holistic plantation management approach increases productivity and helps achieve sustainable development goals. The study also shows that community participation in the decision-making process and plantation management is critical to ensure that the economic benefits generated can be felt by all levels of society.

This research suggests that policies that support sustainable and inclusive management practices need to be strengthened, including through incentives for companies that commit to the SDGs. This research also opens space for further studies to explore the relationship between various aspects of oil palm plantation management and other SDGs indicators. Overall, this discussion underscores the importance of a comprehensive and integrated approach to oil palm plantation management to ensure that efforts to achieve the SDGs do not only focus on economic aspects but also include social and environmental dimensions that are essential for long-term sustainability.

CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

This study reveals that oil palm plantation management that is optimized to support community empowerment and the achievement of Sustainable Development Goals (SDGs) has a significant positive impact on the social and economic welfare of communities around plantations. The findings suggest that an approach that integrates economic, social and environmental aspects in a holistic manner can increase the benefits felt by local communities, especially in terms of income, access to education and health services. However, the study also found that there are still challenges in implementing sustainable practices, especially related to limited infrastructure and policy support in remote areas.

Suggestion

To maximize the benefits of oil palm plantation management for community empowerment in alignment with the SDGs, it is recommended that local governments collaborate with industry stakeholders to improve infrastructure and policy support, particularly in remote areas. Capacity-building programs should be prioritized to enhance the skills of local communities in sustainable agricultural practices, enabling them to better manage resources and increase socio-economic outcomes..

REFERENCES

Abdul Majid, N., Ramli, Z., Md Sum, S., & Awang, A. H. (2021). Sustainable palm oil certification scheme frameworks and impacts: A systematic literature review. *Sustainability*, *13*(6), 3263.

Atapattu, A. J., Ranasinghe, C. S., Nuwarapaksha, T. D., Udumann, S. S., & Dissanayaka, N. S. (2024). Sustainable agriculture and sustainable development goals (SDGs). In *Emerging technologies and marketing strategies for sustainable agriculture* (pp. 1–27). IGI Global.

BPS. (2024). *Community access to education and health services in oil palm plantation areas*. Data processed by author.

Brandi, C., Cabani, T., Hosang, C., Schirmbeck, S., Westermann, L., & Wiese, H. (2015). Sustainability standards for palm oil: challenges for smallholder certification under the RSPO. *The Journal of Environment & Development*, *24*(3), 292–314.

Colchester, M., & Chao, S. (2013). *Conflict or consent?: The oil palm sector at a crossroads*. The Forest Peoples Programme.

Coote, A. (2022). Towards a sustainable welfare state: the role of universal basic services. *Social Policy and Society*, *21*(3), 473–483.

Directorate General of Plantation. (2024a). *Comparison of average income based on plantation management practices*. Directorate General of Plantation.

Directorate General of Plantation. (2024b). *Environmental quality index around oil palm plantations*. Directorate General of Plantation.

Direktorat Jendaral Perkebunan. (2022). Statistik Perkebunan Indonesia 2015-2020. *Jakarta: Kementrian Pertanian*.

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.

FAOSTAT. (2024). *Community empowerment trends in oil palm plantation area*. FAOSTAT.

Gaeva, D. V, Krasnov, E. V, & Gaev, T. V. (2020). Self-Sufficiency and Environmental Sustainability in Agriculture. *Zero Hunger*, 755–766.

Gatto, M., Wollni, M., Asnawi, R., & Qaim, M. (2017). Oil Palm Boom, Contract Farming, and Rural Economic Development: Village-Level Evidence from Indonesia. *World Development*, *95*, 127–140. https://doi.org/10.1016/j.worlddev.2017.02.013

Grant, C. (2017). *The contribution of education to economic growth*.

Kalkanci, B., Rahmani, M., & Toktay, L. B. (2019). The role of inclusive innovation in promoting social sustainability. *Production and Operations Management*, *28*(12), 2960–2982.

Kementerian Pertanian. (2021). *Laporan Tahunan: Perkembangan Perkebunan Kelapa Sawit di Indonesia 2021*. Jakarta: Kementerian Pertanian Republik Indonesia.

Lim, C. I., & Biswas, W. (2015). An evaluation of holistic sustainability assessment framework for palm oil production in Malaysia. *Sustainability*, *7*(12), 16561–16587.

Mohd Hanafiah, K., Abd Mutalib, A. H., Miard, P., Goh, C. S., Mohd Sah, S. A., & Ruppert, N. (2022). Impact of Malaysian palm oil on sustainable development goals: co-benefits and trade-offs across mitigation strategies. *Sustainability Science*, 1–23.

Obidzinski, K., Andriani, R., Komarudin, H., & Andrianto, A. (2012). Environmental and social impacts of oil palm plantations and their implications for biofuel production in Indonesia. *Ecology and Society*, *17*(1).

Ogahara, Z., Jespersen, K., Theilade, I., & Nielsen, M. R. (2022). Review of smallholder palm oil sustainability reveals limited positive impacts and identifies key implementation and knowledge gaps. *Land Use Policy*, *120*, 106258.

Pacheco, P., Gnych, S., Dermawan, A., Komarudin, H., & Okarda, B. (2017). *The palm oil global value chain: Implications for economic growth and socialand environmental sustainability*.

Rahmah, K., Napitupulu, D., & Yanita, M. (2022). Analisis Dampak Kebun Kelapa Sawit Terhadap Sustainable Development Goals (Sdgs) Indonesia. *Sibatik Journal: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, Dan Pendidikan*, *2*(1), 105–114.

Rao, N. C., Bathla, S., Kumar, A., & Jha, G. K. (2018). Agriculture and sustainable development goals: an overview and issues. *Agricultural Economics Research Review*, *31*(conf), 1–7.

Rist, L., Feintrenie, L., & Levang, P. (2010). The livelihood impacts of oil palm: Smallholders in Indonesia. *Biodiversity and Conservation*, *19*(4), 1009–1024. https://doi.org/10.1007/s10531-010-9815-z

RSPO. (2024). *Regression analysis results: Impact of sustainable practices on community income*. RSPO.

Sanz, M. J., de Vente, J., Chotte, J.-L., Bernoux, M., Kust, G., Ruiz, I., Almagro, M., Alloza, J.-A., Vallejo, R., & Castillo, V. (2017). Sustainable land management contribution to successful land-based climate change adaptation and mitigation: A report of the science-policy interface. *Bonn, Germany: United Nations Convention to Combat Desertification (UNCCD)*.

Sofiyuddin, M., Suyanto, S., Kadir, S., & Dewi, S. (2021). Sustainable land preparation for farmer-managed lowland agriculture in Indonesia. *Forest Policy and Economics*, *130*, 102534.

Syahza, A. (2019). The potential of environmental impact as a result of the development of palm oil plantation. *Management of Environmental Quality: An International Journal*, *30*(5), 1072–1094.

Syahza, A., & Asmit, B. (2019). Regional economic empowerment through oil palm economic institutional development. *Management of Environmental Quality: An International Journal*, *30*(6), 1256–1278.

World Bank. (2022). *Sustainable Development Goals and the Palm Oil Industry*. Washington, D.C.: The World Bank Group.