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Evaluation of Smallholder Oil Palm Plantation Sustainability in Tidal Lowlands of Pulau Rimau Sub-District of Banyuasin Regency

Evaluasi Keberlanjutan Perkebunan Kelapa Sawit Swadaya Lahan Pasang Surut Kecamatan Pulau Rimau Kabupaten Banyuasin

Laily Muharani[1], Muhammad Yazid[1*)], Dessy Adriani[1]

[1]Master Program of Agribusiness, Faculty of Agriculture, Sriwijaya University
[*)]Corresponding author: muhammadyazid@pps.unsri.ac.id

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ABSTRAK

Kelapa sawit adalah salah satu komoditas perkebunan yang mempunyai peran penting dalam perekonomian rakyat. Perkebunan kelapa sawit swadaya, sebagai bagian dari perkebunan sawit rakyat masih menghadapi berbagai masalah, antara lain produktivitas rendah, kurang aktifnya kelembagaan, pengelolaan perkebunan yang belum memenuhi standar, kurangnya pengetahuan petani dalam pengelolaan perkebunan, dan sulitnya mendapatkan kredit usaha. Persoalan ini menjadikan perkebunan sawit swadaya sebagai prioritas pemerintah. Perkembangan kelapa sawit dibahas tidak hanya dari sisi ekonomi tetapi juga dari sisi lingkungan. Sejalan dengan hal tersebut penelitian ini dilakukan dengan tujuan untuk menganalisis tingkat keberlanjutan kelapa sawit pada setiap tahapan perkembangan dan mengevaluasi kondisi perkebunan kelapa sawit swadaya berkelanjutan berdasarkan tahapan perkembangan tanaman. Penelitian ini menggunakan metode *survey* dan dilaksanakan di lahan pasang surut Kecamatan Pulau Rimau, Kabupaten Banyuasin pada bulan Agustus-September 2019. Pengambilan sampel menggunakan metode acak berlapis berimbang. Hasil penelitian menunjukkan bahwa terdapat tiga aspek keberlanjutan yang memiliki kriteria rendah, yaitu aspek kelembagaan, sosial, dan teknis. Sedangkan, aspek ekonomi dan lingkungan berada pada kriteria sedang. Nilai rata-rata keberlanjutan perkebunan kelapa sawit swadaya yang belum produktif dan yang produktif berada pada kriteria rendah. Petani kelapa sawit swadaya diharapkan dapat memahami dan mengikuti standar yang ditetapkan ISPO dengan dukungan pemerintah daerah dan instansi terkait.

Kata kunci: kelapa sawit, petani swadaya, lahan pasang surut, keberlanjutan

ABSTRACT

Oil palm is one of the estate commodities that has an important role in the economic activities of the people. Smallholder oil palm plantation as part of the estate still face several constraints, including lack of productivity, institutional inactivity, plantation management that do not meet the standard, farmers' lack of knowledge, and difficulty in obtaining credit. Due to these constraints, oil palm plantation sustainability is put into priority. Oil palm development issues are discussed not only on the economic aspects but also on the environmental aspects. This research is aimed at analyzing the level of oil palm

sustainability and evaluating the condition of smallholder oil palm plantations according to the stages of plant development. This research used survey method and was carried out in tidal lowlands of Pulau Rimau Sub-district, Banyuasin Regency in August-September 2019. Smallholder oil palm households were selected using proportionate stratified random sampling. The results showed that there were three aspects of sustainability that were in low criteria, namely institutional, social, and technical aspects. Whereas, economic and environmental aspects were in medium criteria. The average sustainability value of non productive and productive oil palm plantations was in low criteria. Smallholder oil palm households were expected to understand and follow the standards set by ISPO, with the support from local governments and related agencies.

Keywords: oil palm, smallholder, tidal lowlands, sustainability

INTRODUCTION

The situation of oil palm in Indonesia has changed in the last few decades. The use of palm oil in various industrial sectors stimulates the increase of oil palm production and quality. Baudoin *et al.* (2015) states that oil palm cultivation has become a symbol of the trade-off between development and conservation that farmers must face in the context of global change. This challenge lies between economic growth and environmental issues that have become the focus of public discussion.

The efforts to increase oil palm production are inseparable from various problems. Fatwa *et al.* (2013) states that the problem of oil palm plantations can be seen from the financial and non-financial aspects. In addition, Feintrenie *et al*. (2010) suggest that problems also arise between company plantations and smallholder plantations, where the main causes of conflict between oil palm companies and communities are unclear land ownership, lack of institutional activity, and lack of fair partnerships.

The development of oil palm in the international market currentty has undergone a new paradigm shift from originally built on the basis of profit to more attention to social and environmental aspects. Hadiguna (2012) argues that the world's largest producer of oil palm is facing risks triggered by sustainability issues, such as economic or non-tariff political barriers from several countries. For example, Australia has enacted the Food Standards Amendment (Truth in Labeling - Palm Oil) in 2011.

Lim *et al.* (2015) stated that oil palm offered sustainability benefits by improving socio-economic conditions of the community. However oil palm in the phase of opposition from many parties, especially some international groups, including Green Peace, the Rainforest Action Network and the World Wildlife Fund (WWF). Smallholder oil palm plantation are different from plasma plantations, which are supported by the company. Smallholder plantations generally cultivate oil palm without cooperation with other parties, so that in the development of plantations not in accordance with good agricultural standards and carried out in accordance with the habits of each farmer who is not oriented to quality and agriculture for example, productivity independent farmers applied fertilization once a year and used uncertified seeds. They were inadequate in financial access, difficulty of gaining knowledge and information (World Wildlife Fund, 2011). Efforts to improve smallholder oil palm plantations need farmers understanding regarding sustainability. Sustainability is not only built on the basis of profit, but also activities that refer to the concept of sustainable development (Profit, People, and Planet). Munasinghe (1993) argues that sustainable development itself is the development to meet the needs of today's society by taking into account the ability of future generations to meet their needs. One of the efforts of smallholder oil palm

plantation in the development of sustainable palm oil is to maintain sanitation and avoid land burnt. However, these efforts are not enough if not followed by improving the quality of the farm as well as the fulfillment of quality agricultural inputs, active institutions and supporting social and cultural communities.

According to the efforts to develop sustainable oil palm plantations, the readiness of independent smallholders in facing the process of paradigm shift in the management of oil palm plantations can be done by making measurable plans such as preparation of funding through a partial allowance from sales, increasing knowledge and information about oil palm production technology, and collaboration with superior palm seed sources (Hutasoit *et al*., 2015). As oil palm develops as a regional leading commodity, it is deemed necessary to conduct an evaluation related to sustainable oil palm plantations. This study aims to analyze the level of sustainability of oil palm at each stage of development, and evaluate the condition of sustainable oil palm plantations based on the stages of plant development.

MATERIALS AND METHODS

This research was conducted in tidal lowlands of Pulau Rimau Sub-District of Banyuasin Regency. The location selection is purposive with the consideration that Pulau Rimau Sub -District are smallholder oil palm farmers living occupation and done alone by farmers and families, using uncertified seedlings, owned gardens not in contact with conservation, low productivity, highly dependent on the price, not yet organized, no food land, selling to middlemen and building a garden using their own funds. Data collection in the field was carried out during August 2019.

The sampling method is proportionate stratified random sampling and will be represented by 3 villages in which there are farmers who have Unproductive and productive plant. The total sample of 30 samples of unproductive plant and 30 samples of productive plant farmers, with a respondent rate of 10%.

The key information was determined by the researcher intentionally after visiting Pulau Rimau Sub-District. Information interviewed included the Village Head, Hamlet Head, and Community Leaders.

The reliability test in this study used the Cronbach alpha coefficient test, considered to be reliable if the Cronbach alpha coefficient value was above 0.6. (Supriyadi 2014). While the validity test is done by comparing the value of Corrected item-total correlation with the value of r-table at a significant level of 0.05, in this study amounting to 0.306.

The first hypothesis test is knowing the level of sustainability of smallholder oil palm plantation from unproductive and productive plants in Pulau Rimau Sub-district, Banyuasin Regency, conducted with a Likert scale method that includes 5 aspects of sustainability, namely economic, environmental, social, institutional, and technical aspects. Each aspect is measured by scoring through 7 questions, while score 3 for high criteria, score 2 for medium criteria, and score 1 for low criteria. The lowest total score is 35 and the highest is 105, then the criteria of respondents are categorized as high, medium and low.

The formula used to make class intervals (Sugiyono 2004) is as follows.

RV = HS – LS……...(1)
IL = RV : JK……..……..(2)
Where :
RV = Range value
HS = Highest score
LS = Lowest score
IL = Interval length

The second hypothesis test is comparing the level of sustainability of smallholder oil palm plantation from unproductive and productive plants in Pulau Rimau Sub-district, Banyuasin Regency using the Chi Square statistical test analysis and explained descriptively. Priyanto (2010)

states that the Chi Square formula is as follows:

$$X^2 = \sum_{i=1}^{k} \frac{(fo-fh)^2}{fh} \quad \text{.....(3)}$$

Where:
f_o = Number of observations
f_h = Number of observations expected

At the confidence coefficient 95% and 0.05 significant level, the conclusion drawing criteria.

If, P-value <α (0,05) = Ha accepted and Ho rejected
P-value >α (0,05) = Ha rejected and Ho accepted

Where:
Ho = There is no difference between Unproductive Plants (UP) and Productive Plants (PP)
Ha = There is a difference between Unproductive Plants (UP) and Productive Plants (PP)

RESULTS

The reliability and validity test results show that the data used in the study can reflect the correct level of measure accuracy. In the reliability test, it was found that alpha conbach on Unproductive Plants (UP) was above 0.6 which was 0.822, while the validity test in Unproductive Plants (UP) had an average corrected item-total value of 0.811, greater than r-table of 0.306. Then the reliability and validity test for Productive Plants (PP) has an alpha conbach of 0.741 and the average has a corrected item-total value of 0.725.

The results of the analysis of the sustainability level of Smallholder oil palm plantation based on the stages of plant development in Pulau Rimau Sub-district, Banyuasin Regency, show that there are three aspects that are in the medium criteria and two aspects that are in the low criteria as indicated by the interval value every class indicator (Figure 1).

Table 1. Interval values and class interval criteria to determine the level of sustainability of independent oil palm plantations from unproductive and productive plants in Pulau Rimau Sub-District of Banyuasin Regency

Class Interval (total score)	Class Interval (indicator)	Class Interval (question)	Criteria
35,00 ≤ × ≤ 58,33	7,00 ≤ × ≤ 11,66	1,00 ≤ × < 1,66	Low
58,33 < × ≤ 81,66	11,66 < × ≤ 16,22	1,66 < × ≤ 2,33	Medium
81,66 < × ≤105,00	16,22 < × ≤ 21,00	2,33 < × ≤ 3,00	High

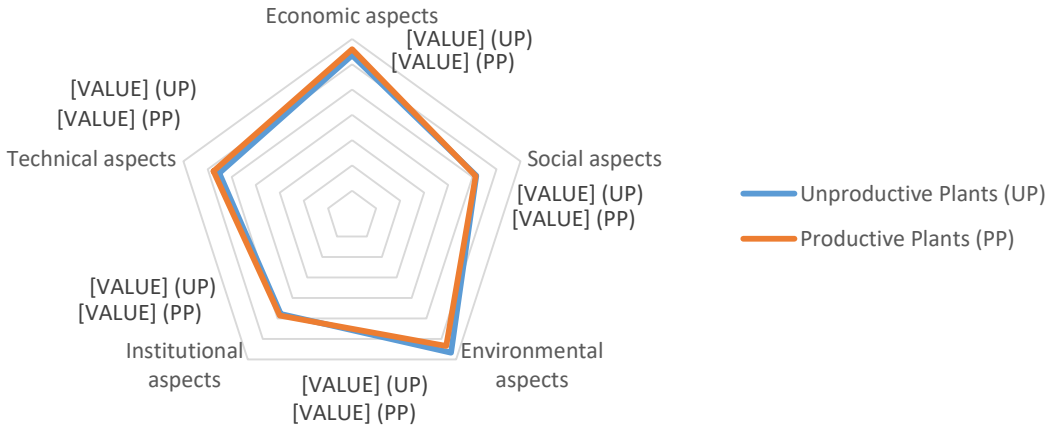

Figure 1. The level of sustainability of oil palm plantations from unproductive and productive plants in Pulau Rimau Sub-District of Banyuasin Regency, 2019

Level of Sustainability of Unproductive Palm Oil Plants

Figure 1 shows that the measurement of the level of sustainability of smallholder oil palm plantation from Unproductive Plants (UP) for social, technical, and institutional aspects is a low criterion with an average score every aspect of $7.00 \leq \times \leq 11.66$. Meanwhile, economic and environmental aspects are in the medium criteria with an average score every aspect $11.66 < \times \leq 16.22$. Based on the description above it is concluded that the level of sustainability of smallholder oil palm plantation from Unproductive plants (UP) is at a low criteria with total score of 56.96.

Level of Productive Plant Sustainability

Figure 1 shows that the measurement of the level of sustainability of Unproductive (UP) smallholder oil palm plantation is almost the same as productive plants (PP). It can be seen that for social, technical and institutional aspects are at a low criteria with an average score every aspect that is $7{,}00 \leq \times \leq 11{,}66$. Meanwhile, economic and environmental aspects are in the medium criteria with an average score every aspect $11.66 < \times \leq 16.22$. Based on the description above it is concluded that the sustainability level of productive smallholder oil palm plantation is at a low criteria with a total score 57.3.

Evaluation of the Sustainability of Smallholder Oil Palm Plantation in Pulau Rimau Sub-District

The results of the statistical analysis of the differences between two stages of the development of sustainable oil palm plants namely immature and productive plants are presented in Table 2. The test results show that the P-value for economic, social, environmental, technical and institutional aspects is 0.498; 0.911; 0.179; 0.328; 0.541; and 0.507. Because the P-value > α (0.05) then reject Ha and accept H0 which means there is no difference between unproductive plants (UP) and productive plants (PP). This shows that all aspects of sustainability in unproductive and productive plants are found to be no difference (P-Value> 0.05). Based on the aspect of sustainability consists of several concepts of sustainability by looking at ISPO criteria. The concept consists of farmers' perceptions about sustainability which are judged qualitatively not based on quantitative, so the results do not have differences in all aspects such as economic aspects seen from ownership of the legality of land and the quality of input material used, then for social aspects as seen from the frequency of conflicts, as well as community knowledge and experience in the processing of sustainable oil palm plantations, the environmental aspects include the suitability of oil palm plantations and conservation actions taken in the event of land damage.

One of the institutional aspects can be seen from the involvement of farmers in the institution and the existence of planned institutional operational activities. Furthermore, the technical aspects can be seen from land clearing and oil palm seedling. The average value of each indicator on unproductive plants (UP) and productive plants (PP) has a value that does not differ greatly and the distribution of data held is in the same range (Table 2). The absence of this difference is due to the influence that the unproductive plants (UP) and productive plants (PP) smallholder oil palm plantation have the same problem that can affect the sustainability conditions of smallholder oil palm plantation in Pulau Rimau Sub-District, Banyuasin Regency.

DISCUSSION

Level of Sustainability of Unpoductive Palm Oil Plants in Pulau Rimau Sub-District, Banyuasin Regency

Self sustaining oil palm plantations on unproductive plants (UP) have experienced many obstacles in their development. The obstacle faced can affect the level of sustainability, one of the problems is that farmers' knowledge of sustainable

plantations is still low. In addition, the institution is not active in providing information and socialization that can affect land productivity. While improving the institutional aspect makes it possible to improve the sustainability of oil palm plantations as revealed Ngadi (2017).

Lack of knowledge of smallholder oil palm plantation in the Pulau Rimau Sub-District makes technical in the management of oil palm plantations unable to support increased productivity and quality of gardens. As is the case with the selection of agricultural input materials, namely the use of certified seeds and the use of fertilizers that are not according to the rules.

This is according to the statement of Briot *et al*. (2014) that 50% of smallholder oil palm plantation in Lampung Province use uncertified seedlings and farmers who are willing to cultivate unproductive plants (UP) are still in the low category. Opportunities to increase the sustainability of unproductive plants (UP) smallholder oil palm plantation in Pulau Rimau Sub-District, Banyuasin Regency are open along with the increase in every aspect of sustainability. The importance of balancing the sustainability aspects of unproductive plants (UP) can at least provide higher productivity during productive plants (PP).

Level of Productive Plant Sustainability

The sustainability of oil palm in productive plants in Pulau Rimau Sub-district has obstacles that prevent the level of plant sustainability. Constraints faced are not only economic constraints, namely low price stability and unmet capital availability, but also social, environmental, institutional, and technical constraints.

Smallholder oil palm plantation in Pulau Rimau Sub-District face inadequate quality and access to distribution (roads and transportation) of Fresh Fruit Bunches (FFB), while distribution access is important in distributing harvests because delays in transporting Fresh Fruit Bunches (FFB) will affect the processing and quality of the final product Ugroseno and Wachjar (2017). In addition, the availability of agricultural input materials is difficult to obtain and has a high price, so farmers only fertilize once a year or do not fertilize at all. According to Juliansyah and Supijatno (2018), that the application of fertilizer in oil palm plantations is done at least 2-4 times a year with fertilizer types namely CCM44, Kieserit and HGFB

Garden sanitation and weeding has been done well, and for fruit harvesting it is already in good criteria because it has done mature harvesting (50% - 75% of fruit outside regardless) orange colored fruit. Farmers have carried out fire prevention and control by keeping the garden in a clean condition, even though it has no tertiary drainage.

Evaluation of the Sustainability of Smallholder Oil Palm Plantation in Pulau Rimau District

Oil palm plantations have become the leading commodity for Banyuasin Regency, most of the people make oil palm as their main livelihood. The average oil palm plantations in Banyuasin Regency, especially in Pulau Rimau Sub-District are community or smallholder oil palm plantation. So that with the issue of sustainability, the Banyuasin Sub-district government is more active in encouraging improvements in the land management system, especially to smallholder oil palm plantation.

The results of the evaluation analysis of the sustainability of smallholder oil palm plantation unproductive plants (UP with the sustainability of Productive Plants (PP) show no real difference, because it can be seen from the level of sustainability that is in a low position which can be interpreted that smallholder oil palm plantation, especially in Pulau Rimau Sub-District must be considered (Table 2).

Table 2 shows that the average value of the sustainability aspect is at the low criteria. This means that smallholder oil palm plantation in Pulau Rimau Sub-District are still on criteria that cannot yet

be accepted by the new paradigm of global oil palm development. Kospa (2016) states that the development of sustainable oil palm plantations can be achieved by solving problems that occur in economic, socio-political, and environmental aspects. Other aspects that affect the area of research. The problem of palm oil plantation needs to be overcome so as not to distort the competitiveness of Indonesian oil palm products in the global market and to anticipate potential conflicts from these aspects.

There are problems that are often faced by smallholder oil palm plantation in an effort to improve quality in accordance with the concept of sustainability, including from the economic aspect, namely the availability of agricultural input materials that are technically quite easy to get but have high prices and have low quality, in addition The potential of smallholder oil palm plantation workers only relies on family labor. Furthermore, interest in farming is still low because farmers are more concerned with the necessities of life rather than the development of farming, and the availability of credit or business capital is still difficult to access. Whereas oil palm requires production costs which is large especially at the beginning of the period when farmers are not likely to finance themselves (Wigena *et al.*, 2016). Institutional aspects namely the institution does not have an active role in efforts to improve the sustainability of oil palm plantations, for example the lack of socialization and information on the existence of work plans and institutional activities, the lack of facilities and institutional cooperation with related parties, as well as the low level of farmers' trust in performance and institutional management. Najmi *et al*. (2019) argues that an institution is a set of rules that are obeyed and supported by facilities and human resources in meeting the needs of those institutional supporters. In connection with this it is no exaggeration to say that farming can only be successful if it is supported by the relevant institutions. Environmental aspects where the Pulau Rimau Sub-District on average have primary drainage and secondary drainage, but rarely have tertiary drainage. Conservation actions are not actively carried out by smallholder oil palm plantation because on average farmers only fertilize once a year and it is not uncommon for farmers not to fertilize because of the availability of capital that is not met. The location of the independent garden is not in the forest area but has a short distance from the residence, this condition is not good for the environmental conditions of the residence because ground water will dry quickly and mixed with agricultural input materials that are given to oil palm plantations. This is consistent with research conducted by Oktami et al. (2014) that the benefits of environmental aspects can be seen from the protection of wildlife, integrated management of plants and waste, conservation of ecosystems, water, and land carried out by farmers.

Table 2. Evaluation of the sustainability of unproductive and productive plants in Pulau Rimau Sub-District of Banyuasin Regency, 2019

Sustainability Aspects	UP N = 30	Criteria	PP N = 30	Criteria	P-value
Economic	12,70 ± 1,14	Medium	13,20 ± 1,06	Medium	0,498
Social	10,33 ± 1,30	Low	10,27 ± 0,90	Low	0,911
Environmental	13,33 ± 1,19	Medium	12,67 ± 1,15	Medium	0,179
Technical	9,57 ± 1,03	Low	9,70 ± 1,90	Low	0,328
Intitutional	11,03 ± 1,10	Low	11,50 ± 1,05	Low	0,541
Sustainability	56,96 ± 2,68	Low	57,30 ± 3,25	Low	0,507

The social aspect seen in the community's perception of sustainable agriculture is very lacking because it is not supported by knowledge and training. But the frequency of conflicts in Pulau Rimau sub-district, especially Rawa Banda, Sumber Mulyo, and Rukun Makmur Village rarely occur because the community is accustomed to doing mutual cooperation that can increase solidarity. Besides that Nasrul *et al*. (2012) argued that the factors influencing social aspects improvement were farmer empowerment, policy synchronization, land conflict resolution, and law enforcement.

Technical aspects, in accordance with the reality in the field that smallholder oil palm plantation in the Pulau Rimau Sub-District do not place much importance on the quality of their oil palm plantations, just as the average farmer still uses dura seeds that provide low quality and productivity, in addition to technical planting does not use spacing as appropriate, until the maintenance of plants in support of productivity must still be improved. In addition, it can be seen that farmers have harvested only ripe fruit and have cleared land that is not detrimental to the environment by not being burned. Ariyanti *et al*. (2017) states that the exploitation of oil palm plantations is still individually, there is no apparent motivation that should be a strong capital for the success of a program. This is a challenge in itself to provide more positive inputs and opportunities that can increase the motivation of individual farmers. Universities, especially those related to sustainable oil palm cultivation techniques, need to intensify the transfer of research results to farmers.

CONCLUSION

Based on the results of the study, the following conclusions are obtained: The sustainability of Unproductive smallholder oil palm plantation and the sustainability of productive smallholder oil palm plantation are included in the low criteria. The five aspects of sustainability for the 2 stages of the development of smallholder oil palm plantation there are three aspects which are at low criteria, namely social, institutional and technical aspects. And there are two aspects which are in the medium criteria, namely economic and environmental aspects. Chi-square test results show that there are no differences in all aspects of the sustainability of unproductive plants and productive plants.

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