HJTAS
Holistic: Journal of Tropical Agriculture Sciences
HJTAS 2(2): 127–144
ISSN 3025-4272

Institute for Advanced Science, Social and Sustainable Future
MORALITY BEFORE KNOWLEDGE

Barriers and readiness for implementation of Indonesian sustainable palm oil in independent smallhollders plantations: A case study

Lestia Revi*
[1] *Master of Environmental Science Program, Universitas Tanjungpura, Pontianak City, West Kalimantan Province, 78124, Indonesia.*
*Correspondence: revilestia@gmail.com

Received Date: September 17, 2024 Revised Date: December 10, 2024 Accepted Date: January 31, 2025

ABSTRACT

Background: Smallholders have been required to implement a sustainable system in developing their plantations. Sustainability aspects that have been determined by the government that must be obeyed and fulfilled by every smallholder are listed in the principles and criteria of Indonesian Sustainable Palm Oil (ISPO). This research will focus on how smallhodelrs preferring and implementation gap ISPO certification requirements, as well as what factors cause these gaps. **Methods**: Data was collected based on direct interviews with 11 Village Unit Cooperative Administrators (KUD) in Sanggau Regency. The data was then processed and studied using the Gap Analysis method. **Findings:** The average implementation of ISPO in the respondent cooperatives is only 37 percent, which means that there is no implementation of ISPO in in the practice of cultivating oil palm plantations by independent smallholders. Independent smallholders need special training in its implementation some of the factors that cause gaps in the implementation of ISPO in independent smallholders in Sanggau Regency include organizations that are not well developed, limited access to finance. **Conclusion**: The lack of information obtained by independent smallholders regarding the principles and procedures for implementing ISPO, as well as the lack of socialization of sustainable cultivation practices from both government and private institutions. One of solution to that problems is need a patner organization who can collaborate to implementation ISPO in smallholders. **Novelty/Originality of this article:** This research contributes to the limited studies on ISPO implementation among independent smallholders, particularly in Sanggau Regency. Unlike previous studies that focus on large-scale palm oil industries, this study provides empirical insights into the practical challenges faced by smallholders.

KEYWORDS: gap analysis; independent smallholders; ISPO; smallholders; sustainability.

1. Introduction

The plantation commodity that has a large contribution as a contributor to the country's foreign exchange with a value of up to US$ 25 billion is palm oil. In 2021, it was reported that Indonesia's palm oil export volume reached more than 25 million tons. This export is in the form of derivatives of several palm oil products, including crude oil or Crude Palm Oil (CPO) and other derivative products in quite large quantities. The palm oil plantation industry has also proven to be able to improve people's standard of living. According to data from the Directorate General of Plantations in 2020, this commodity business was able to provide employment for more than 7.3 million direct workers, and

Cite This Article:
Revi, L. (2025). Barriers and readiness for implementation of Indonesian sustainable palm oil in independent smallhollders plantations: A case study. *Holistic: Journal of Tropical Agriculture Sciences, 2*(2), 127-144. https://doi.org/10.61511/hjtas.v2i2.2025.1146

more than 14 million indirectly connected workers. In addition, the number of workers absorbed in small-scale plantation management reached more than 4.6 million people. Furthermore, in terms of plantation area, based on data from the Directorate General of Plantations (2022), the area of oil palm plantations in Indonesia in 2022 reached 16.38 million hectares, consisting of 53% private plantations, 40% small-scale plantations and 7% state-owned plantations. In reality, these small-scale oil palm plantations (smallholders) consist of two categories, namely plasma plantations and independent plantations (Jelsma et al., 2017).

The large number of small-scale plantations is a potential for development that needs attention. However, the existence of these plantations often receives international attention regarding their business practices which are suspected of not paying attention to aspects of sustainability, so that their production is often questioned in international trade (Risyadi et al., 2023). In response, the Indonesian government currently requires every small-scale plantation to implement a sustainable system from land acquisition to management practices. In this regard, the Indonesian government as a regulator is responsible for ensuring sustainability in the palm oil plantation industry. To achieve this, the government has implemented several regulations that must be adhered to and fulfilled by every business actor, including through the Indonesian Sustainable Palm Oil (ISPO) certification (Minister of Agriculture Indonesia, 2020). This ISPO certification system has been designed for all businesses in the palm oil plantation sector, both privately owned, government-owned, and small-scale plantations (Ambarita et al., 2023). For this reason, the government issued regulations on ISPO, in the form of Permentan No. 38 of 2020 which is an update of Permentan No. 18 of 2015.

The government targets that by 2025 all small-scale oil palm plantations will be required to follow ISPO certification. However, until now, many of these small-scale plantations still do not know and understand about ISPO, so its implementation is still low. Pramudya et al. (2022) stated that the implementation of ISPO on small-scale plantations is very slow. In line with that, the results also found evidence that the fulfillment of ISPO standards in small-scale plantations in the West Kalimantan region was only 33%. This finding is reinforced by the results of research by Sabinus et al. (2021) which showed that the fulfillment of ISPO standards in the Bonti District-Sanggau Regency-West Kalimantan area was only 34.05%. This research is a continuation of several of these studies, but with more focus on the aspect of finding solutions that can be offered in solving obstacles and obstacles to ISPO fulfillment that have not been achieved in previous studies.

In 2021, Sanggau Regency had 139,859 hectares of oil palm plantations. This regency is also a pioneer plantation area in West Kalimantan Province (Central Bureau of Statistics, 2021). Plasma plantations in Sanggau Regency began with a plantation development program with an integrated People's Core Company (PIR) pattern in 1986. In addition, there are also plasma plantations originating from the PIR-TRANS program.

In Indonesia, all plasma plantations are required to join the Village Unit Cooperative (KUD) as an effort to organize and develop the economy for small-scale businesses. Therefore, the fulfillment of ISPO for small-scale plantations cannot be separated from the existence and role of village unit cooperative as the fostering institution, although in many circumstances KUD often does not have the capacity to implement it. In addition to the institution or organization, another important aspect is the standard for the success of ISPO implementation which needs to be formulated appropriately in accordance with the expectations intended in the regulations. For this reason, the formulation of ISPO performance measures must be an important part. In this regard, studies on the implementation of ISPO must also be improved, because so far the understanding of this topic is considered to be still very limited. This study is directed to assess the success and realization of ISPO implementation in plasma plantations in West Kalimantan, as well as to identify obstacles in its implementation. In other words, this study focuses more on assessing the readiness of small-scale farmers in implementing ISPO and finding solutions that can be applied in fulfilling ISPO.

2. Methods

This research was conducted in 11 independent oil palm plantation cooperatives, namely in Sungai Mayam Village and Penyelimau Village, Meliau District, Sanggau Regency, West Kalimantan Province. The selection of the location was based on the fact that the independent plantations in the area are the oldest plantations originating from the 1988 PILTRANS program. In addition, the area size allows for observations. This research was conducted in October 2022-November 2023 using interview guidelines (questionnaires) that include indicators and criteria based on the 5 principles listed in Appendix 2 of Permentan No. 38 of 2020.

The number of respondents interviewed was 11 people who were representatives of each KUD. Data were analyzed qualitatively and quantitatively. Qualitative analysis was used to describe the meaning of interview data that could not be quantified, while quantitative analysis was to determine the implementation score of the principles, criteria, and indicators that were the ISPO criteria, namely by using the following formula determining the implementation score (I).

$$I = \frac{number\ of\ indicators\ fulfilled}{total\ number\ of\ indicators} \times 100\% \quad \text{(Eq. 1)}$$

Table 1. Scoring criteria for implementation

Percentage%	Criteria
96-100	Requirements or policies have been implemented properly
90-95	Requirements or policies have been implemented well but not consistently
76-89	Some requirements or policies have been implemented but are still inconsistent.
51-75	There are still requirements or policies that have not been implemented properly.
0-50	Implementation is not carried out in accordance with existing policies. Palm oil companies / plantations still need special training in its implementation.

The gap score (G) is calculated to measure the discrepancy between the ideal policy expectations and its actual implementation. It is determined using the formula $G = \frac{(\mathrm{K} - \mathrm{I})}{100\%}$ where K represents the ideal policy score (%) and I denotes the policy implementation score. This calculation provides insight into the extent of deviation from the intended policy objectives. The criteria for evaluating the gap score are outlined in Table 2.

Table 2. Criteria for evaluating the gap score

Gap score	Criteria
96-100	The implementation of the ISPO policy has been successful or according to plan and can resolve the issues experienced by independent smallholders.
90-95	The implementation of the ISPO policy has not been successful or has not been in accordance with the plan and has not been able to resolve the issues experienced by independent smallholders, therefore an evaluation is needed.

3. Results and Discussion

3.1 KUD Research site and plantation area

Small-scale plantations in the research area consist of two categories, namely plasma plantations and independent plantations. In an area, both types of plantations are managed by a Village Unit Cooperative (KUD), and this cooperative is under the guidance of the Cooperative Service in the Regency. The cooperative plays a role in accommodating Fresh Fruit Bunches (FFB) of oil palm harvested by farmers. Therefore, the role of KUD is very important in the overall management of the plantation, including in fulfilling ISPO.

In terms of area, the area of plasma plantations reaches around 80% of the total area of Plantation Business Permits (IUP) in the area, while the area of independent plantations does not yet have accurate data, because the area of each owner's plantation is often not recorded properly. The proportion of such a large plantation from the total area of existing plantations, so the fulfillment of ISPO implementation is an absolute must for these small-scale plantations. Before discussing the implementation of ISPO, in each KUD that is the location of the research. In this section, it is important to first state the characteristics of the KUD in question, to provide an initial picture of the condition of the KUD which is the organization of oil palm farmers (Putri et a., 2022). Descriptions of the area of plantations, number of members, and year of oil palm planting in each KUD can be seen in Table 3.

Table 3. KUD research location and plantation area

An example of a column heading	Garden area (ha)	Number of members (people)	Average area of plantation ownership per member (ha)	Planting year
Beautiful	1004	484	2.07	1993, 1994, 1995, 2020
The Great Hill	986	499	1.98	1995
Kasastra	1018	434	2.35	1994
Musa Jaya	1186	200	5.93	1992, 1992, 1996, 2021
Hope for Glory	246	45	5.47	2008
Star of Hope	728	329	2.38	1993, 1998
Sutari Palm Oil	1000	510	1.96	1993-1996
Mukti Jaya Oil Palm	850	425	2.00	1992-1999
Pang Linggan	500	250	2.00	1993-1998
Mega Palm Oil	800	230	3.48	1992-1999
Beautiful	Garden Area (ha)	Number of Members (people)	Average Area of Plantation Ownership per Member (ha)	Planting Year

Based on the data in Table 3, it appears that the average area of plantation ownership by cooperative members ranges from 2 to 6 hectares. The average area is highly dependent on the existence of independent plantations. The higher the proportion of independent plantations compared to plasma plantations, the wider the average plantation ownership will be. This is because plasma plantations are limited in size by the provisions of the Indonesian government, which is 2 hectares, while independent plantations are based on farmer land ownership which can reach tens of hectares. Regarding the implementation of ISPO for the eleven village unit cooperative studied, 2 village unit cooperative are preparing for ISPO certification in 2024, while 9 KUDs have not yet prepared for ISPO certification. The following section will describe in more detail the dimensions of the implementation of the ISPO in question.

3.2 ISPO implementation dimensions

The discussion on ISPO implementation in this section focuses on five key principles outlined in Indonesian law. These principles include compliance with the legality of plantation businesses, the application of good plantation practices, environmental management, natural resource and biodiversity conservation, transparency, and the promotion of sustainable business development. The first principle, compliance with the legality of plantation businesses, consists of five criteria with a total of 14 indicators. Based on interviews with each village unit cooperative. administrator, the findings indicate that the average fulfillment rate for this principle is only 50%. A more detailed overview of compliance with applicable regulations and legal requirements is presented in Table 4.

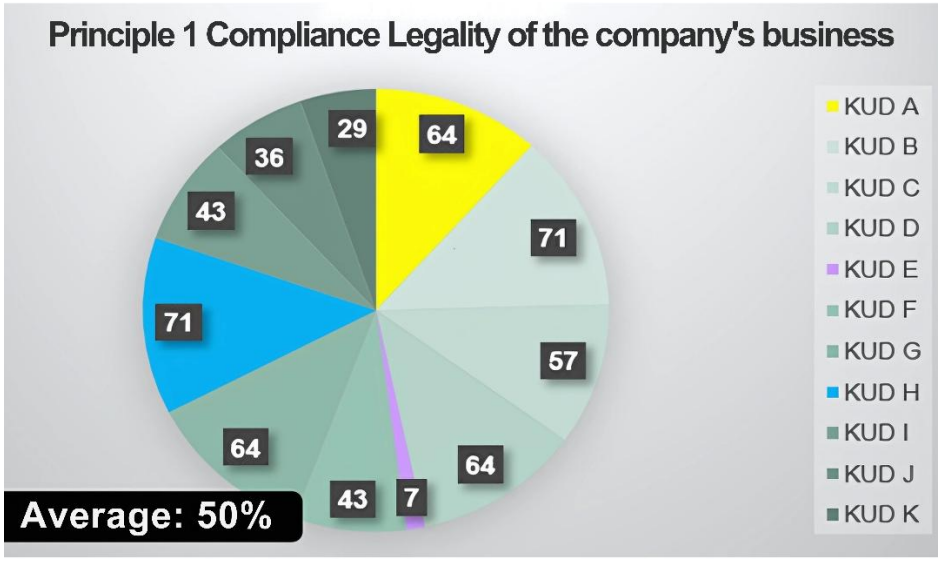

Fig. 1. Implementation data of principle 1 of independent plantation cooperatives

The first criterion in principle 1 is regarding the legality and management of the plantation. This criterion must be proven by ownership of a land certificate, land sale and purchase deed, or other proof of ownership, either issued by the relevant agency or in the process of being processed. In relation to this legality, the reason why KUD members do not have a land deed or valid proof of ownership is because the sale and purchase process was not properly documented. Often during the sale and purchase process, the land deed or proof of ownership is not processed at the notary, so the reverse process is not carried out. Another problem that often occurs is that some plantation land comes from family inheritance, so the name on the deed or other valid proof of ownership is different from the name of the person managing the land.

Table 4. Categories of compliance with regulations and legislation

Compliance aspects	Fulfil	Does not meet the	Description
Legality and management of plantations	76%	24%	Eligible category: has a land certificate or deed of sale and purchase
Garden location	86%	14%	Category meets: KUD management already knows that the location of the members' garden is in accordance with the regional spatial planning plan.
Land disputes and compensation and other disputes	15%	85%	Categories meet: KUD has data or documentation on resolving land disputes and other disputes
Legality of the Plantation business	36%	64%	Categories meet: The farmer already has a plantation business registration certificate for cultivation (STD-B)
Obligations related to environmental permits for farmer groups or plantation cooperatives are required to fulfill the requirements and must have an Environmental Management and Monitoring Letter (SPPL).	0 %	100%	Categories meet: KUD is required to implement the requirements and must have an environmental management and monitoring letter (SPPL)

The second criterion is regarding the location of the garden, some KUD administrators already know that the location of the member's garden is in accordance with the regional spatial plan, while in some KUDs (±14%) there are those who do not know whether the garden area of each KUD member is in accordance with the spatial planning plan or not. In relation to this spatial planning plan, there has been no socialization or notification from the relevant agency for spatial planning in this KUD area. This aspect is also the reason why KUD members and administrators do not know whether their garden area is in accordance with the spatial planning plan or not.

The third criterion is regarding land disputes and compensation, as well as other disputes. Land dispute resolution documents are managed and regulated by the local village apparatus, so that documentation and data at the time of the dispute are not stored by the KUD administrators. The fourth criterion is the legality of the plantation business or can be said to be a business license. The business license criteria that must be owned is ownership of a plantation business registration certificate for cultivation (STD-B). The administration of STD-B to the government is closely related to the need for proof of land ownership [land ownership certificate/land certificate (SKT)] and this is often the main obstacle. Thus, this fourth criterion is directly related to the first criterion. In full, the requirements needed in submitting STD-B are: application letter, photocopy of KTP/domicile certificate, certificate of plantation ownership from the village head, photocopy of proof of land ownership (land ownership certificate/SKT), certificate of origin of seeds/seed certificate, statement of sale/delivery of seeds, sketch of the location of the plantation, and statement of ownership of a plot of land/plantation. Not only related to ISPO, ownership of STD-B also has several other advantages, including being a requirement for recipients of assistance for the People's Oil Palm Rejuvenation (PSR) program.

The fifth criterion is the obligation related to environmental permits. This criterion can be equated with the Amdal obligation for companies. In this case, small-scale plantation owners are required to have an environmental management and monitoring letter (SPPL). It was reported that in general KUDs do not know the procedure for submitting SPPL to the relevant agency. This is due to the lack of information and socialization regarding the implementation procedures. In addition, in general, plantation owners do not realize and know the benefits and importance of SPPL. The second principle, the implementation of good farming practices, consists of three criteria encompassing 38 indicators that assess the application of proper plantation management. Based on the evaluation of its implementation, the average fulfillment rate is only 39%, which is still significantly below the expected standard.

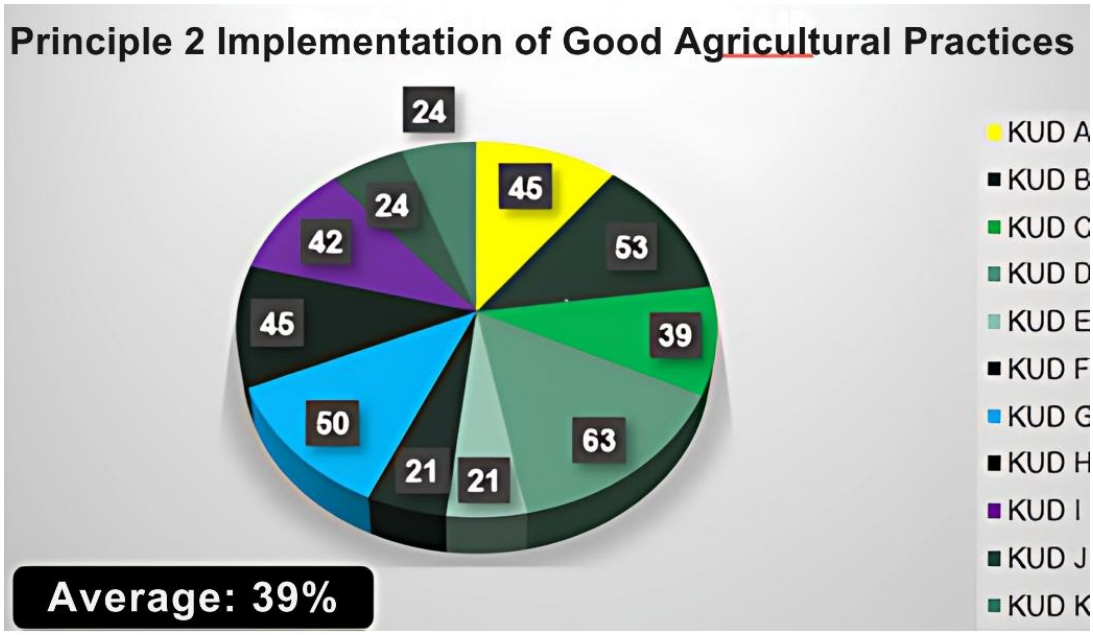

Fig. 2 Implementation data of principle 2

The first criterion is the institutional organization of the plantations. This criterion has been met by all KUDs. The second criterion is garden management. This criterion is often not met, because in cultivation practices it is not fully held by the KUD management but by each farmer. It was identified that out of 11 KUDs studied, only 3 KUDs already had a garden management plan.

Table 5 Implementation of good plantation practices

Compliance aspects	Fulfil	Does not meet	Description
Institutional organization of planters	100%	0%	Categories meet: KUD has documents in the form of a deed of establishment and an institution in the form of a cooperative that has been approved by an authorized official.
Plantation management	27%	73%	Categories meet: KUD has a document on the operational activity plan for the plantation owners
Application of cultivation techniques	30%	70%	Categories meet: Have documents (SOP, plant maintenance and control of plant pests (OPT), harvesting activities, sales and price agreements to third parties (factories).

Next, the third criterion, namely regarding the technical application of cultivation consisting of several technical indicators, such as land clearing, seeding, planting on mineral and peat lands, plant maintenance, control of plant pests (OPT), harvesting, and transportation of oil palm fruit. The results show that each KUD does not yet have a standard of operational (SOP) in the technical application of oil palm cultivation. On the other hand, it is quite good for the aspects of land clearing and seeding.

In this case, for KUD members who have participated in the People's Oil Palm Rejuvenation program, they tend to be in accordance and have clear documents, while KUDs that have not participated in the PSR program do not yet have clear land clearing documents and seed origins. This fact shows that in fulfilling this criterion, it is still very dependent on external assistance. Likewise, regarding the documentation of soil types in each plantation area, although in fact each KUD area has a mineral soil type, for the implementation records, none of the KUDs have provided this data.

The next indicator is regarding fertilization, plant maintenance, and control of plant pests (OPT), all of which are indicated as still not being carried out optimally and have not been recorded properly. In the process of plant maintenance and OPT control, everything is still under the control of each KUD member. This means that all decisions in these activities depend on each individual farmer. On the other hand, in terms of indicators regarding harvesting, all KUDs have records or recordings of harvesting implementation in the plantation areas of each KUD member. Thus, KUDs only play a large role in harvesting activities, sales, and price agreements with third parties (factories). Even related to harvesting, for indicators of fruit transportation records, almost all KUDs do not yet have and implement technical instructions for transporting FFB.

The third principle, which focuses on the management of the environment, natural resources, and biodiversity, consists of two criteria and eight indicators. However, the overall fulfillment rate for this principle is only 7%, indicating that its implementation is still significantly lacking and far from the expected standards. The implementation of the first criterion, namely fire prevention and control, has not been carried out properly.

Only one KUD has carried out this indicator, namely KUD Musa Jaya, which already has equipment to prevent fires and conducts periodic fire emergency response simulations. In this case, KUDs generally do not have fire fighting equipment and supplies, the reason being that the price of the equipment is quite expensive so that extra funds are needed. In addition, it is also due to the lack of awareness of the importance of having such equipment for prevention and overcoming greater losses.

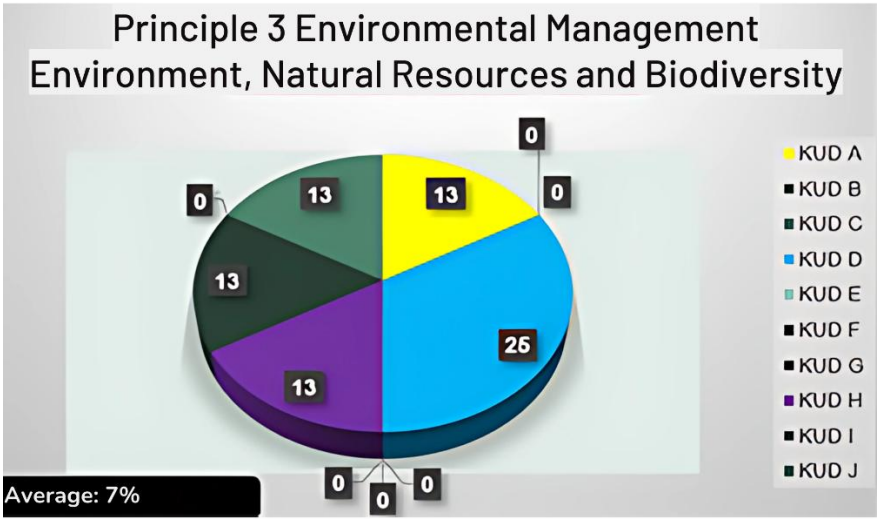

Fig. 3. Implementation data of the 3 independent KUD plantation principles

However, it was reported that no KUD has an SOP for fire prevention and control, including documents containing information on areas prone to fire . Ironically, most farmers who are members of KUDs still open land by burning, for example when adding to the area of oil palm plantations. Land clearing actions usually begin for the purpose of farming and then after farming is finished, the land area is planted with oil palm (Astari et al., 2025). The act of burning land for farming in the West Kalimantan area is still permitted in accordance with the West Kalimantan Provincial Government Regulation No. 1 of 2022 which contains provisions for opening farming land in accordance with local wisdom. Land clearing actions like this actually contradict the main objective of ISPO, which is to encourage farmers to intensify land by increasing productivity without carrying out expansion actions (Dharmawan et al., 2019; Dharmawan et al., 2021) .

Compliance Aspects	Fulfil	Does not meet	Description
Fire prevention and control	14%	86%	Categories meet: KUD has documents in the form of a deed of establishment and an institution in the form of a cooperative that has been approved by an authorized official.
Conservation of biodiversity	0%	100%	Categories meet: KUD has environmental management documents around the plantation, both in terms of plans and realization of identification of rare animals and plants.

The second criterion is regarding the preservation of biodiversity, and it was reported that no KUD has met this criterion. Environmental management related to biodiversity around the plantation has never been implemented, so there has been no plan or realization of identification of rare animals and plants around the plantation location. In this regard, independent farmers do not yet know and do not have records of the existence of animals and plants around the plantation, although farmers have realized that there have been several changes in the number and types of flora and fauna around their plantations compared to several decades ago. In addition, there are no actions or activities related to conservation carried out by farmers. In fact, according to Dafeng (2013), biodiversity has an important role in maintaining productivity, stability, sustainability, and other ecosystem services were still found around the PT BHD plantation area which is near the small-scale farmer KUD plantation area.

Table 7 Flora found around PT BHD 2022

No	Local Name	Latin Name	Information
1	Pelaik/Pulai	*Alstonia spp*	
2	Guava	*Eugenia sp*	
3	Adjust/ Kepuak	*Sorea sp*	
4	Rubber	*Hevea brasiliensi*	
5	Tengkawang is the victim	*shorea seminis*	Protected
6	Rattan Sega	*Daemonorops rubra*	
7	Mabang	*shorea panchyphylla*	
8	Durian	*Durio zibethinus*	
9	Lebanon	*Vitex pubescens*	
10	The Ant	*Passiflora foetida L*	
11	cempedak	*Artocarpus rigidus*	
12	Meranti	Shorea sp	
13	Forest Pineapple	Cryptanthus acaulis	
14	Water Jackfruit	Shorea sp	
15	The Tungkul Mountain	Shorea macrophylla	Protected
16	Cracked	Vatican Wallichi	
17	Manau Rattan	*Daemonorops*	
18	Betel nut	*Areca palm*	
19	Palm/Enau	*Pinnate palm*	
20	Jengkol	*Archidendron pauciflorum*	
21	Cottonwood	*Ceiba pentandra*	
22	Bungur	*Langerstreomia speciosa*	
23	Rengas	*Melanorrhea waallichi*	
24	Bemban	*Donnax canniformis*	
25	Forest Longan/Bidara	*Dimocarpus sp*	
26	The Simpur	*Dillenia indica*	
27	Mango Sour	*Mangifera sp*	
28	Mahang	*Eugenia sp*	
29	Coconut	*Cocus mucifera*	
30	Pandanus	*Pandanus sp*	
31	Pitcher Plant	*Cyanite sp*	
32	Nutgrass	*Cypanus payrus*	
33	The Dancing	*Malestoma sp*	

Several types of protected flora and fauna were found in the area around the plantation, so this can be a reference that perhaps in some areas around the plantations of small-scale farmers there are also several types of protected flora and fauna. Each species is known as a biotic factor, so when it enters an ecosystem it will have an important role in the sustainability of the ecosystem and the conservation of natural resources in its environment (Patel, 2014). Biodiversity is known to have an important role in maintaining the balance of the ecosystem, as well as providing resilience to environmental pressures and climate change. Therefore, environmental management plans and identification of biodiversity need to be carried out immediately so that the flora and fauna are not threatened with extinction.

Table 8 Fauna found around PT BHD in 2022

No	Local Name	Latin Name	Information
1	Monkey	*Macaca fasicularis*	
2	Weasel	*The virus is a parasite*	
3	Labi-labi	*Chintraindical*	
4	Turtle	*Orlira sp*	
5	Mouse	*Rattus rattus*	
6	Python Snake	*Reticulated python*	
7	Monitor lizard	*Varanus sp*	Protected
8	Cow Swallow	*Colocalia esculenta*	
9	Little Grouse	*Dendrobium javanica*	

10	Turtle Dove	*Streptopelia chinensis*
11	Mouse Eagle	*Elanus caeruleus*
12	Butbut Bird	*Centropus sinensis*
13	Yellow butterfly	*Common grass yellow*
14	Red dragonfly	*Neurothemis fluctuans*
15	Warbler	*Pycnonotus sp*

Threats to biodiversity can be mitigated through the application of science and technology, particularly by identifying and inventorying biodiversity in terms of distribution, existence, utilization, and management systems (Sutoyo, 2010). However, ensuring the sustainability of ecosystems and conserving areas that serve as vital buffers for both community livelihoods and economic stability requires active involvement from both the community and the government in its implementation (Aisyah et al., 2013). The fourth principle, which emphasizes the implementation of transparency, consists of two criteria and seven indicators. The achievement of this principle within KUD has been relatively good, with an implementation rate of approximately 69%.

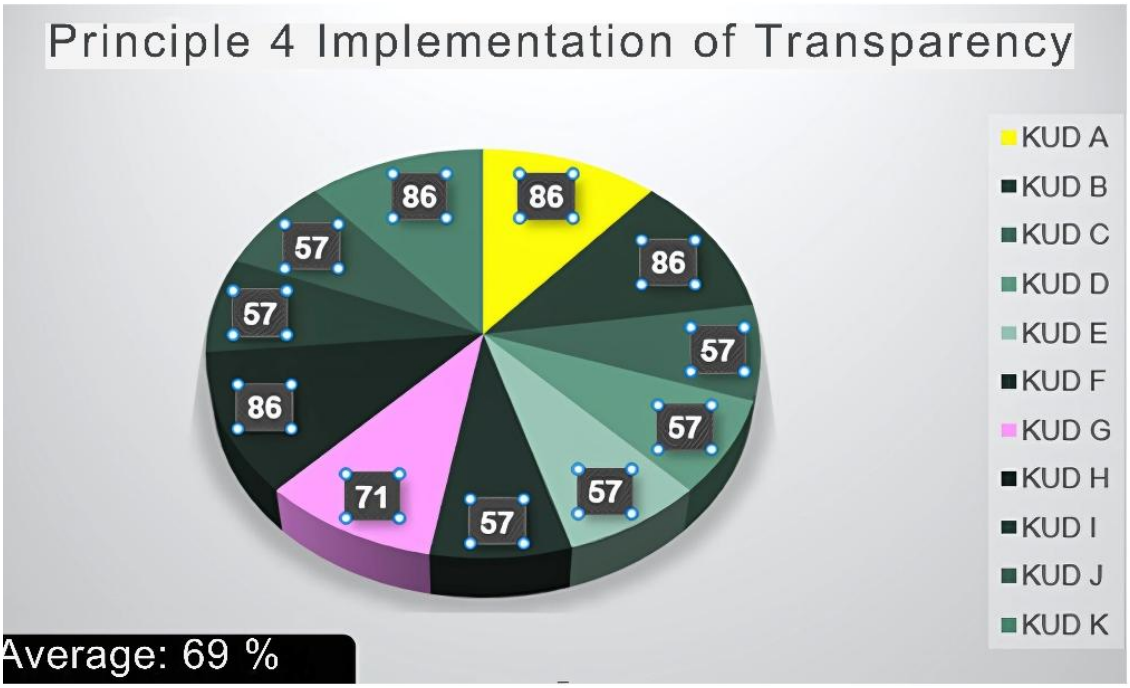

Fig. 4. Achievements of transparency implementation

The first criterion regarding the sale and price agreement of TBS has been fulfilled 100% in each KUD. This shows that there is good transparency regarding the price of TBS in accordance with market developments. In fact, the source of information for determining the purchase price of TBS has been monitored by the farmers, groups and/or cooperatives routinely. In addition, there is also ena partnership cooperation agreement document signed by both parties as well as the head of the Regency/Province and the head of the plantation office.

Criteria two is regarding the provision of data and information, although in principle it has not run well, in practice farmers provide some information such as providing data reports required by the government, notification of information regarding the requirements of a program or assistance obtained from various interested parties. However, this is often not recorded and documented by KUD administrators in its implementation. Therefore, the weakness is in terms of recording or administrative order in the KUD organization.

Then, continuous business improvemen, this principle consists of one criterion and two indicators. The first indicator is the availability of potential identification documents and corrective actions. The implementation of this identification can be carried out by a

competent third party in the plantation sector or it can also be a member of the KUD management who already understands and is competent in that sector. The second indicator is the availability of records related to sustainable plantation business improvement activities. The implementation of all indicators in principle 5 has reportedly not been fulfilled by all KUDs. As evidence, documents on the implementation of sustainable business improvement/improvement in each KUD have not been found. In fact, according to Harsono et al. (2012), in the implementation of ISPO there needs to be a plan that covers the upstream to downstream parts of the palm oil industry, with the hope that this planning can increase the excellence of the Indonesian Palm Oil industry (Watts et al., 2021). This is in line with the Regulation of the Minister of Agriculture Number 38 of 2020 which has included this principle in the ISPO criteria for the Palm Oil industry.

The reasons for not fulfilling this indicator are the lack of knowledge, expertise and willingness of each member of the plantation owners and KUD administrators in efforts to improve oil palm plantation cultivation (Andrianto et al., 2019). Based on the fulfillment of the five ISPO principles above, a picture of the overall fulfillment of ISPO at the research location is obtained. The lowest ISPO implementation score was held by KUD J, which was 24%, while the highest implementation score was held by KUD D at around 55%. It should be noted that on average, KUDs that have this ISPO implementation score are KUDs that have received assistance from the PSR (People's Oil Palm Rejuvenation) program, so this also does not show independence in implementing ISPO (Andrianto et al., 2019). In this PSR program, there are several implementation monitoring documents that must be fulfilled by each farmer, and this is a requirement for obtaining assistance from the program. Overall, the average value of ISPO implementation in this study was 37%. This means that there is a tendency that implementation has not been carried out in accordance with existing policies. This result is not very different from the findings of previous studies. The results of the study reported that the fulfillment of ISPO standards in small-scale plantations in West Kalimantan was only 33%. Likewise, the results of the study by Sabinus et al. (2021) showed that the fulfillment of ISPO standards in small-scale plantations was only 34.05%. Considering these results, special training is needed for small-scale oil palm plantations so that they can apply all ISPO principles. This is important because the proportion of ISPO implementation must reach 100% so that ISPO certificates can be issued by ISPO certification institutions.

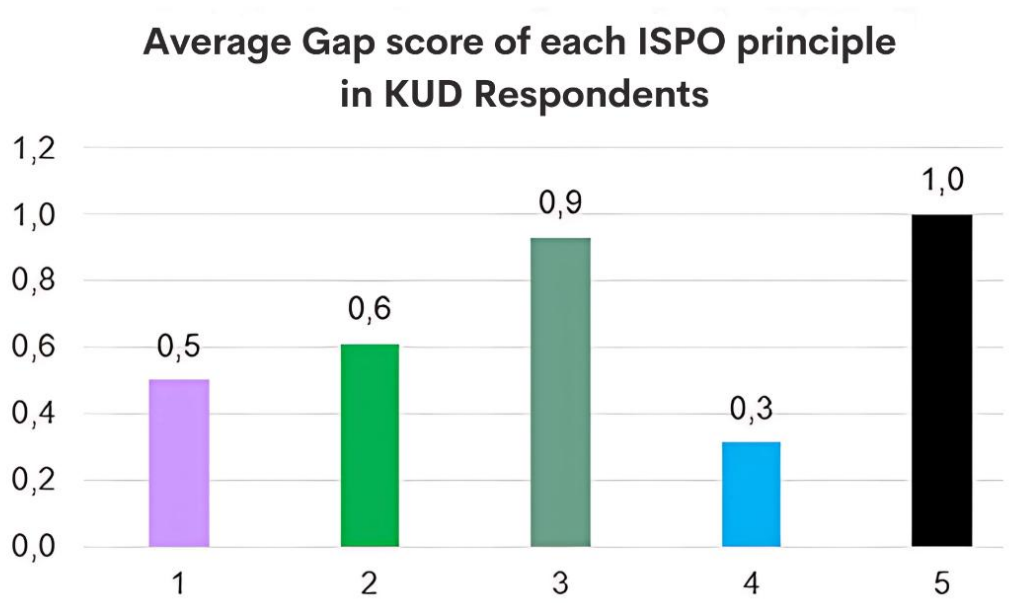

Fig. 5. Average GAP score of each ISPO principle in small-scale plantations

Based on Figure 5, it is known that the average gap score of principle 1 is 0.5%. This shows that the implementation of principle 1 has been sufficiently fulfilled, namely that

almost all KUDs have begun to comply with regulations and laws. Likewise, the implementation of principle 4, the gap score is 0.3, which indicates transparency and the implementation of the TBS price agreement in sales. Meanwhile, the average gap score of principle 2 is 0.6% (> 0.5%) which indicates that the farmers have not fully implemented good plantation practices. Likewise, the average value of principle 3 is 0.9% which indicates that environmental, natural resource, and biodiversity management has not been implemented. Furthermore, principle 5 has an average gap analysis score of 1%, which clearly shows that the farmers have not carried out sustainable business improvements.

Overall, the result obtained an average ISPO gap analysis score of 0.7%, so it can be concluded that the implementation of ISPO policies in small-scale plantations has not been successful and has not been able to overcome the problems faced. Therefore, special evaluation and assistance are needed in implementing ISPO in the plantation area. The average fulfillment of ISPO standards is relatively low because in overcoming the obstacles faced by farmers, they cannot do it themselves, especially in terms of access to information, technology, financial input, and markets. This is in line with the fact that the adoption of ISPO certification is highly dependent on the ability, knowledge of agricultural practices, business legality, and household income of farmers (Hutabarat & Binawidya 2017).

3.3 Obstacles of independent plantations in implementing ISPO

The obstacles faced in the implementation of ISPO include several aspects, including internal problems inherent in KUD and external aspects outside KUD such as the problem of weak information obtained and the minimal role of other institutions that should support. This section describes these aspects within the framework of finding solutions to overcome obstacles to fulfilling certification. The condition of internal aspects that often-become obstacles in the implementation of ISPO is known to be related to the problem of human resources of the plantation owners. In this case, it is felt that the level of education of KUD administrators and members is an important factor in understanding how to increase the productivity of oil palm plantations. It is known that plantation owners who have adequate levels of education will be more receptive to technological developments and increased efficiency of plantation businesses. Therefore, improving internal conditions is an important dimension

Due to the weak internal factors of KUD administrators in the field, KUD administrators only play a role in harvesting activities, sales, TBS price agreements, and handling submissions for government programs. As a further implication, the institutional function of KUD has not been running well, especially in increasing plantation productivity. So, in this regard, KUD administrators in general do not understand the implementation of good oil palm plantation cultivation. Based on the review of various existing constraints originating from outside the KUD, there are at least four aspects that need to be considered, namely related to access to information, financial access, the role of government, and the role of the private sector. The characteristics of the constraints of the four aspects are described in this section.

3.3.1 Access to information and financial access

Access to information about ISPO is considered still weak. In fact, to support the acceleration of ISPO certification, access to information about certification and also procedures for sustainable plantation cultivation are needed. This is in line with the findings of Hutabarat et al. (2017) which stated that for ISPO certification, access to information, technology, input and finance is very necessary. In this study, it was found that 55 percent of KUDs had never attended ISPO certification socialization, either organized by the government or private institutions, the rest (45%) had attended ISPO socialization organized by private institutions, namely those organized by partner companies (PT BHD) and NGOs. Likewise, for the socialization of sustainable oil palm plantation cultivation according to ISPO standards, around 64% of KUDs had never attended the socialization.

ISPO certification requires several requirements such as a report on environmental management and monitoring activities whose legality is issued by the relevant agency in the form of an Environmental Management and Monitoring Letter (SPPL). In addition, there needs to be equipment and supporting facilities for the implementation of oil palm cultivation, such as fire extinguishing equipment. All of these aspects require quite large funding, so this is considered burdensome for KUD. In fact, ISPO certification funding assistance can be obtained from the State Revenue and Expenditure Budget (APBN), Regional Revenue Budget (APD), and other legitimate sources, as stated in Presidential Regulation Number 44 of 2020. However, most KUDs do not yet know the procedure for submitting the funds needed to the government (Hadi et al., 2023).

3.3.2 Role of government

The performance of ISPO certificates in independent plantations cannot be separated from the role of the government, because the farmers really need government support in the form of information related to certification procedures and sustainable oil palm cultivation practices. Unfortunately, the government's role is still minimal, for example in this study, out of 11 KUDs, only 36% have received information on oil palm cultivation from the government. In Sanggau Regency as the research area, it was reported that the ISPO program has been started by providing assistance in obtaining a Cultivation Registration Certificate (STD-B) and a Land and Building Tax (PBB) letter for plantations. There are several obstacles for agricultural agencies in the district, including limited assistants and limited funds for ISPO socialization in the field. In fact, the agricultural service in the region is tasked with explaining and operationalizing laws and regulations in the field, especially those related to land legality, STD-B and SPPL (Hutabarat 2017). In addition, administrative training and the creation of standard of procedures (SOP) in cultivation activities also need to be determined and taught to each KUD administrator so that all administrative activities are not difficult and make it easier for farmers in cultivation practices. However, almost all KUDs do not have complete administration and adequate SOPs.

In addition to the government, the role of partner companies is no less important. The role of the company is as a direct mentor because it already has sufficient experience in ISPO certification and implementing sustainable plantation practices. In this case, PT Bintang Harapan Desa (PT BHD) and the Non-Governmental Organization (LSM Solidaridad) have provided training activities on ISPO certification for KUD officers, namely in the form of technical training on cultivation, environmental management, and utilization of other facilities and infrastructure. This activity is a form of the company's commitment to producing palm oil-based products with a sustainable supply chain that is environmentally friendly, and oriented towards improving the welfare of farmers (Dedi, 2022; Aziz et al., 2021).

3.4 Stakeholders' involvement in ISPO certification for independent smallholders

In ISPO certification, there are several interrelated parties, namely KUD and its members, government, partner companies, and other institutions. The mechanism of interrelationships between stakeholders can be illustrated in Figure 6. To achieve ISPO certification, it is essential to enhance the role of all relevant stakeholders, as illustrated in Figure 6. According to Hadi et al. (2023), several key strategies must be implemented to accelerate ISPO certification.

These include the acceleration of the People's Oil Palm Rejuvenation (PSR) program, improving collaboration between certification bodies such as ISPO and RSPO, and empowering both Private Large Plantations (PBS) and National Large Plantations (PBN) (de Vos, 2023). Additionally, strengthening plantation institutions, developing an accelerated ISPO certification model, and reinforcing the good palm oil campaign are crucial steps (Heriyanto et al., 2023).

Furthermore, providing training and mentoring, along with offering fertilizer subsidies and premium Fresh Fruit Bunch (TBS) prices for ISPO-certified plantations, will contribute significantly to the successful implementation of ISPO certification. The role of a good palm oil campaign is very important ihn certification, because it will have a positive impact on the acceptance of ISPO as a recognized sustainability standard (Umayah et al., 2021). For this reason, it is necessary to increase the number of field assistants in the PSR and ISPO programs. The dimensions are not only increasing the number of assistants but also their quality, and therefore it is necessary to carry out routine evaluations of the assistant's performance so that the program and plan can run well as expected. This is because field assistants are the initial key to certification information that can be obtained by smallholders.

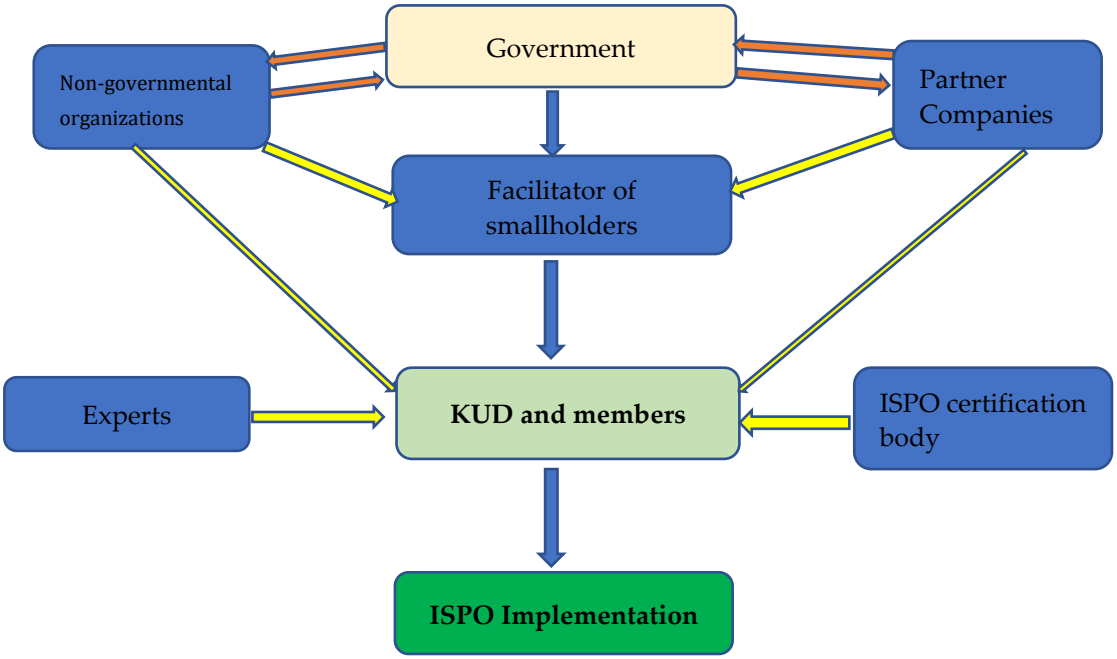

Fig. 6. Relationship between stakeholders in ISPO Implementation

4. Conclusions

The performance of ISPO implementation on independent plantations is still considered low, reaching only around 37%. The cause is that there are still many obstacles faced by the plantation owners in implementing sustainable plantation management including fulfilling all the requirements required for certification, such as not being able to carry out environmental management and monitoring activities. Therefore, special assistance and training are needed to fulfill all the requirements. There are several factors that cause the gap in ISPO implementation, including: plantation organizations (KUD) that are not yet well developed, limited financial access, lack of information obtained regarding the principles and procedures for implementing ISPO, and lack of socialization regarding sustainable oil palm plantation cultivation practices from both government and private institutions.

Additionally, independent plantation owners often lack the technical expertise needed to meet ISPO standards, making compliance more challenging. The complexity of the certification process also discourages many smallholder farmers from pursuing ISPO certification. Financial constraints make it difficult for farmers to invest in infrastructure and technology that support sustainable practices. Moreover, the absence of strong market incentives for ISPO-certified products reduces the motivation for independent plantation owners to comply with the standards. Strengthening government policies and incentives could help bridge this gap and encourage broader ISPO adoption. Collaboration between

stakeholders, including government agencies, private companies, and non-governmental organizations, is crucial to improving ISPO implementation and ensuring long-term sustainability in the palm oil industry.

Acknowledgement
The author gratefully acknowledges the reviewers for their valuable critiques and insightful recommendations, which greatly improved this manuscript. Additional thanks are extended to colleagues and mentors who provided guidance and support throughout the research process.

Author Contribution
The author was solely responsible for the design and execution of the research, data analysis, interpretation of results, and manuscript preparation.

Funding
This research received no external funding.

Ethical Review Board Statement
Not availbale.

Informed Consent Statement
Not availbale.

Data Availability Statement
Not availbale.

Conflicts of Interest
The authors declare no conflict of interest.

References
Aisyah, S., Rachman, A. C., & Rusli, Y. (2013). Peningkatan peran pemerintah dan masyarakat sebagai upaya menjaga ekosistem dan konservasi lingkungan di Dieng Plateau. *Jurnal Organisasi dan Manajemen, 9*(2), 135–1244. https://dx.doi.org/10.33830/jom.v9i2.43.2013

Ambarita, H. R., Suryantini, A., & Darwanto, D. H. (2023). The implementation of Indonesian sustainable palm oil on oil palm plantations smallholders in Kumai District, Central Kalimantan Province. *Agro Ekonomi, 34*(1). https://doi.org/10.22146/ae.69503

Andrianto, A., Fauzi, A., & Falatehan, A. F. (2019). The typologies and the sustainability in oil palm plantation controlled by independent smallholders in Central Kalimantan. In *Rural socio-economic transformation: Agrarian, ecology, communication and community, development perspectives* (1st ed., pp. 12).

Ariadhy, S. Y. (2022). Sustainable palm oil governance: A case study of sustainable palm oil certification in Indonesia. In *Proceedings of the International Conference on Sustainable Environment, Agriculture and Tourism (ICOSEAT 2022)* https://doi.org/10.2991/978-94-6463-086-2_44

Astari, A. J., Lovett, J. C., & Wasesa, M. (2025). Sustainable pathways in Indonesia's palm oil industry through historical institutionalism. *World Development Sustainability, 6*(2). https://doi.org/10.1016/j.wds.2024.100200

Aziz, N. F., Chamhuri, N., & Batt, P. J. (2021). Barriers and benefits arising from the adoption of sustainable certification for smallholder oil palm producers in Malaysia: A systematic review of literature. *Sustainability, 13*(18), 10009. https://doi.org/10.3390/su131810009

Central Bureau of Statistics. (2021). *West Kalimantan palm oil statistics 2021*. Central Bureau of Statistics. https://www.bps.go.id/id/publication/2022/11/30/254ee6bd32104c00437a4a61/statistik-kelapa-sawit-indonesia-2021.html

Dafeng, H. (2013). Global climate change and biodiversity: Issues and future research. *Journal of Biodiversity and Endangered Species, 1*(2). https://doi.org/10.4172/2332-2543.1000e105

Dedi. (2022, October 20). Disbunak Kalbar appreciates the independent oil palm farmer association in Ketapang for declaring to be able to get ISPO. *Antara News Kalimantan* Barat. https://kalbar.antaranews.com/berita/508729/disbunak-kalbar-apresiasi-perkumpulan-petani-swadaya-di-ketapang-deklarasi-agar-bisa-ispo

de Vos, R. E., Suwarno, A., Slingerland, M., van der Meer, P. J., & Lucey, J. M. (2023). Pre-certification conditions of independent oil palm smallholders in Indonesia: Assessing prospects for RSPO certification. *Land Use Policy, 130*. https://doi.org/10.1016/j.landusepol.2023.106660

Dharmawan, H., Hadi, A., Nasdian, F. T., Barus, B., Kinseng, R. A., Indaryanti, Y., Indriana, H., Mardianingsih, D. I., Rahmadian, F., Hidayati, H. N., & Roslinawati, A. M. (2019). Readiness of independent oil palm farmers in the implementation of ISPO: Environmental issues, legality, and sustainability. *Journal of Environmental Science, 17*(2), 304. https://doi.org/10.14710/jil.17.2.304-315

Dharmawan, A. H., Mardiyaningsih, D. I., Rahmadian, F., Yulian, B. E., Komarudin, H., Pacheco, P., Ghazoul, J., & Amalia, R. (2021). The agrarian, structural and cultural constraints of smallholders' readiness for sustainability standards implementation: The case of Indonesian Sustainable Palm Oil in East Kalimantan *Sustainability, 13*(5), 2611. https://doi.org/10.3390/su13052611

Directorate General of Plantations. (2020). *Indonesian plantation statistics*. DITJENBUN. https://ditjenbun.pertanian.go.id/?publikasi=buku-publikasi-statistik-2018-2020

Directorate General of Plantations. (2022). *Indonesian plantation statistics*. DITJENBUN. https://ditjenbun.pertanian.go.id/?publikasi=buku-publikasi-statistik-2018-2020

Hadi, S., Bakce, D., Muwardi, D., Yusri, J., & Septya, F. (2023). Strateg y to accelerate ISPO certification in independent oil palm plantations. *Agricultural Policy Analysis,* 21(1), 21–42. https://epublikasi.pertanian.go.id/berkala/akp/article/view/3068

Harsono, D., Chozin, M. A., & Fauzi, A. M. (2012). Analysis on Indonesian sustainable palm oil (ISPO): A qualitative assessment on the success factors for ISPO. *Jurnal Manajemen & Agribisnis, 9*(2). https://journal.ipb.ac.id/index.php/jmagr/article/view/5529

Heriyanto, M., Freddy S, H. T. R., Mayarn, M., Susanti, R., Habibie, D. K., & Vani, R. V. (2023). Institutional role of independent smallholders in realizing sustainable palm oil plantation governance. *SDGs Journal, 12*(1). https://doi.org/10.55908/sdgs.v12i1.2473

Hutabarat, S. (2017). Tantangan keberlanjutan pekebun kelapa sawit rakyat di Kabupaten Pelalawan, Riau dalam perubahan perdagangan global. *LIPI, 1*, 58–59. https://doi.org/10.22146/jae.27789

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

Minister of Agriculture Indonesia. (2020). Regulation of the Minister of Agriculture of the Republic of Indonesia Number 38/Permentan/OT.140/3/2020 concerning the Indonesian Sustainable Palm Oil Certification System (ISPO).

Patel, D. K. (2014). Biodiversity and its importance. *Journal of Biodiversity and Endangered Species, 2*(4). https://doi.org/10.4172/2332-2543.1000e117

Putri, E. I. K., Dharmawan, A. H., Hospes, O., Yulian, B. E., Amalia, R., Mardiyaningsih, D. I., Kinseng, R. A., Tonny, F., Pramudya, E. P., Rahmadian, F., & Suradiredja, D. Y. (2022). The oil palm governance: Challenges of sustainability policy in Indonesia. *Sustainability, 14*(3), 1820. https://doi.org/10.3390/su14031820

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), 2–28. http://dx.doi.org/10.3390/land11040576

Risyadi, I., Dolorosa, E., & Kurniati, D. (2023). Determinant of farmers' readiness level and their strategies in independent palm oil plantations in Kapuas Hulu Regency. *Jurnal Manajemen & Agribisnis, 20*(1) https://doi.org/10.17358/jma.20.1.112

Sabinus, Y. E., & Oktoriana, S. (2021). Implementation of Indonesian sustainable palm oil system (ISPO) certification for independent oil palm smallholders in Sanggau Regency. *Journal of Agricultural Socioeconomics, 14(*2), 166–179. https://jurnal.unej.ac.id/index.php/JSEP

Sutoyo. (2010). Keanekaragaman hayati Indonesia: Suatu tinjauan—Masalah dan pemecahannya. *Jurnal Keanekaragaman Hayati, 10,* 101–106. https://jurnal.unitri.ac.id/index.php/buraanasains/article/view/199

Umayah, D., Purnomo, E. P., Fadhlurrohman, M. I., Fathani, A. T., & Salsabila, L. (2021). The implementation of Indonesian sustainable palm oil (ISPO) policy in managing oil palm plantation in Indonesia. *IOP Conference Series: Earth and Environmental Science, 943*(1), 012022. https://doi.org/10.1088/1755-1315/943/1/012022

Watts, J. D., Pasaribu, K., Irawan, S., Tacconi, L., Martanila, H., Wiratama, C. G. W., Musthofa, F. K., Sugiarto, B. S., & Manvi, U. P. (2021). Challenges faced by smallholders in achieving sustainable palm oil certification in Indonesia. *World Development, 146*. https://doi.org/10.1016/j.worlddev.2021.105565

Widyatmoko, B. (2023). Interests Arrangement in the Implementation of Indonesian Sustainable Palm Oil Certification: Case Study of Sari Makmur Palm Oil Smallholders in Riau Province. In Mizuno, K., Kozan, O., Gunawan, H. (eds) *Vulnerability and Transformation of Indonesian Peatlands. Global Environmental Studie*s. Springer, Singapore. https://doi.org/10.1007/978-981-99-0906-3_11

Biographies of Author

Lestia Revi, Currently the author is a Research and Development (R&D) staff of PT Bintang Harapan Desa specializing in agronomy and plant pests, has taken an undergraduate education at the Department of Plant Protection, Bogor Agricultural University in 2012-2016 then continued his master's degree in Environmental Science, Tanjungpura University.

- Email: revilestia@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A