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Analysis of the implementation of Indonesian Sustainable Palm Oil-ISPO Certification at farmer level in West Pasaman Regency

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Abstract. As consumer demand for sustainable palm oil increases, the Indonesian government responds by issuing the Indonesian Sustainable Palm Oil [ISPO] Guidelines, which since 2015 have become Indonesia's Sustainable Palm Oil Certification System. Currently, only 33% of the total oil palm area obtain ISPO certificates predominantly from private companies. As most oil palm plantations are smallholders owned, they must be prepared to meet this certification to enable Indonesia's palm oil industry to maintain its market share in the world market. However, ISPO certification has not been known at the farmer level widely. This research aims to analyze the effect of farmers' knowledge on the application of ISPO principles. The study employed a survey method involving 57 oil palm farmers. Primary data were collected using questionnaires and analyzed with the structural equation modeling method [SEM]. The results reveal that farmer knowledge on benefit and risk variables is in the moderate category, while farmers' perception of ISPO simplicity is low. In applying ISPO principles, farmers have a high score on land legality and farm management, while environmental management and sustainable business are low. The estimation results obtained that farmers' level of knowledge does not affect the application level of ISPO principles.

Keywords: ISPO, palm oil, smallholders

1. Introduction

Palm oil is an important export commodity in Indonesia. Generally, the export value fluctuated in the past eight years, even though the export volume increased [Figure 1]. Indonesia's palm oil exports in 2019 reached 29.55 million tons with a value of US \$ 15.57 billion. The export volume increased slightly [0.84%] in 2019; however, the export value declined.

The challenge behind the palm oil industry's rapid development is the emerging problems and negative issues in palm oil production. One of them related environmental issues that oil palm plantation has caused environmental damage [2] [3] [5].

These problems need to be addressed to maintain Indonesian palm oil products' competitiveness by realizing sustainable palm oil development through the government's commitment to effectively and efficiently implement ISPO Certification [5]. In response to the demand for sustainable palm oil management, the Roundtable on Sustainable Palm Oil [RSPO] was established in 2004 to promote sustainable palm oil products through credible global standards and stakeholder engagement. At the national level, the Indonesian government launched the Indonesia Sustainable Palm Oil [ISPO] Standard in 2011. About 80 percent of Indonesia's oil palm plantations are targeted to be certified as



sustainable oil palm plantations in 2020; however, only 27.40% of total oil palm plantations have been ISPO certified [9].

This paper discusses the performance of ISPO implementation at the farmer's level. The farmer's knowledge of ISPO certification and ISPO standards' application at the farmer level is assessed. Factors affecting the application of ISPO standards are also identified.

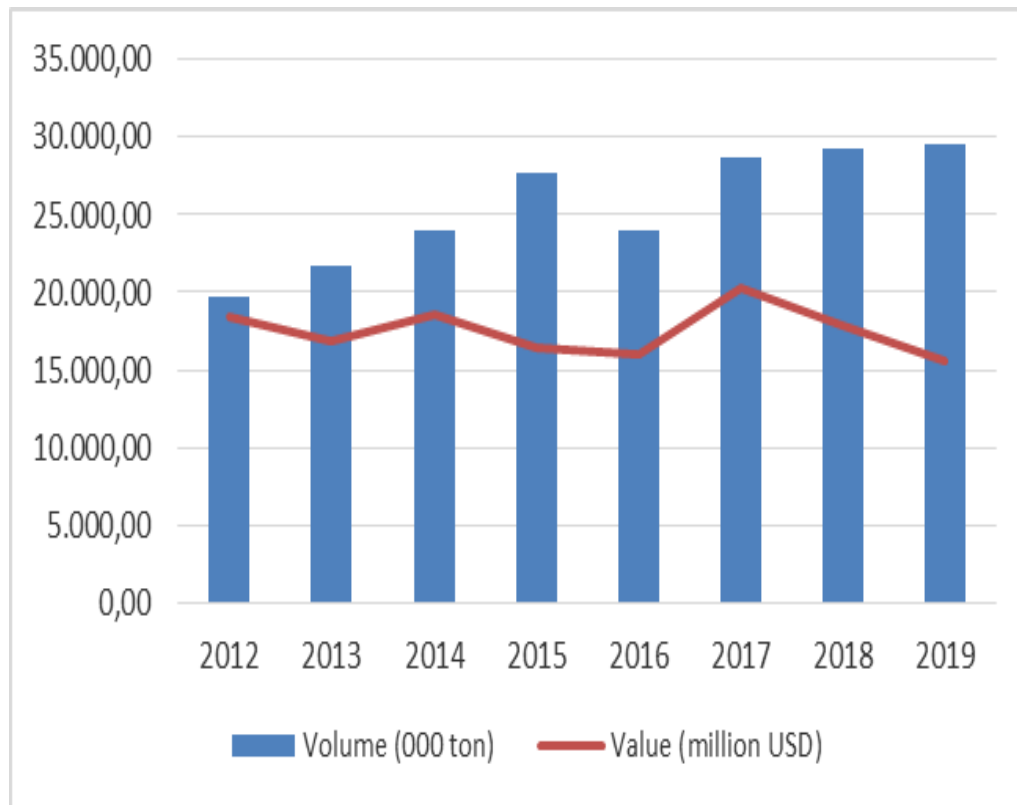


Figure 1. Palm oil export 2012 – 2019

2. 2. Materials and Methods

This research was carried out in Luhak Nan Duo, West Pasaman Regency, involving 53 sample farmers who are a member of 4 Farmer Cooperatives. The survey method was used in data collection by conducting interviews using questionnaires.

Three variables to measure the farmer's perception of applying ISPO certification principles and criteria are benefits, ease, and risk perception. The level of application of ISPO certification indicators by farmers was measured based on ISPO certification principles and criteria consisting of 6 principles and ten criteria. Table 1 describes the variables and indicators measured in this study.

The level of perception of oil palm farmers' plasma pattern towards ISPO certification is measured using a Likert scale with a scale score of 3: agree = 3, neutral = 2, and disagree = 1. Three scales were used to measure the level of application of ISPO indicators, namely 1 = not to apply [TM], 2 = apply partially [SM], and 3 = apply properly [M]. The data were analyzed using structural equation modeling [SEM].

Table 1. Variables and indicators

Variable	Indicators
Benefit	Improving productivity; farm more environmentally friendly; higher selling price; guaranteed marketing; improve the quality of CPO products
Ease	comfortable in applying ISPO certification due to the availability of guidance; easy to do because funded by the government at the first-period; ease of applying ISPO certification due to availability of technical assistance; the principle, criterion, and indicator are clear.
Risk	Hesitation to apply the principles of ISPO because not widely applied; It requires a large fee for the second period.
The level of application of ISPO standard	the legality of plasma farms Plasma farm management environmental management and monitoring responsibility for occupational health and safety social responsibility and community empowerment continuous improvement of the business.

3. Results and discussions

We found that ISPO Certification has not been socialized well at the farmer level. Farmers have not seen significant benefits from ISPO certification. Although the certification cost is expensive, there is no difference in palm oil products' selling price between those from ISPO-certified and non-certified farms. A study by [7] found that the implementing organization's weak authority and lack of ability of ISPO to convince the global market may contribute to failure to meet ISPO's target.

3.1. Level of knowledge of independent farmers on ISPO Certification

Most farmers [58%] are at a mature age, and 62% of farmers have been farming for 21 - 30 years. In this study, respondents were dominated by men [74%], and 70% of farmers obtained high school education. All sample farmers have an area of 2 hectares each.

The results showed that farmers have a low perception of high production, high prices, and better CPO quality if obtaining an ISPO certificate with scores of 80, 64, and 68, respectively [low category]. Farmers consider the farm more environmentally friendly and guaranteed marketing if it implements ISPO with a score < 120 [moderate category].

Most farmers [96%] disagreed that the ISPO principle is easy to do. This response shows that farmers have inadequate knowledge and understanding of ISPO certification's ease because proper guidance is not available. The government provides funding for the first period of certification; however, this assistance has not been appropriately implemented. This factor can hinder the implementation of ISPO certification.

Perceptions of risk will affect the desire and interest of farmers to apply ISPO principles and criteria. Assessment of the risk of ISPO has a moderate score. It means that farmers have good knowledge of the risks of ISPO certification.

3.2. *Application of ISPO principles and criteria by independent farmers*

ISPO certification for independent farmers consists of four principles and eight criteria. Compliance and implementation of all economic, social, and environmental aspects and legality will be a measure in implementing the ISPO certification system [7].

Results showed that the scores of independent farmers in applying the principle of ISPO ranged from 49 to 63, with an average score of 56. In Figure 2, it appears that most farmers [43 people] apply the principle of ISPO with a score of < 59 [a low category]. Only ten farmers applied the ISPO principle in the moderate category [scores 59 – 77].

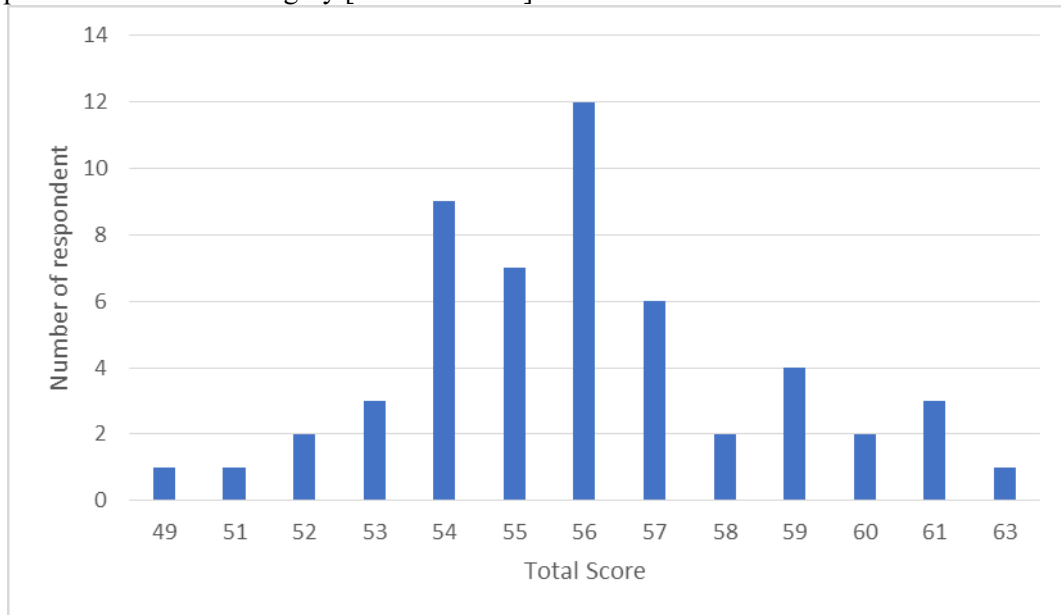


Figure 2. ISPO principle implementation score by smallholder farmers

Of the four ISPO principles measured, the implementation of environmental management and monitoring principles has the lowest score [Table 2]. Farmers have a high score on-farm legality and management.

Table 2. Implementation of ISPO principles on independent farmers

ISPO Principles	Total score	Achieved	Category
Principle 1: Farm legality	527	83%	High
Principle 2: Farm Management	1932	81%	High
Principle 3: Management and Monitoring Environment	418	44%	Low
Principle 4: Sustainable Business Improvement	89	56%	Low
Total	2966	72%	Medium

The obstacles and challenges faced by independent farmers are also implementing ISPO certification of Farmers Group in Pelalawan Regency with the implementation rate of 16.67% of 48 ISPO indicators [10]. Limited information, financial and government support are also the most important inhibitors of ISPO certification.

3.3. *Factors influencing the application of ISPO principles by independent farmers*

The study involved three latent variables and 12 indicators. The structural equation model for the implementation of ISPO is presented in Figure 3. The initial model test results showed that some

indicators have multicollinearity problems and low factor loading values. Therefore, the model was modified by removing some indicators.

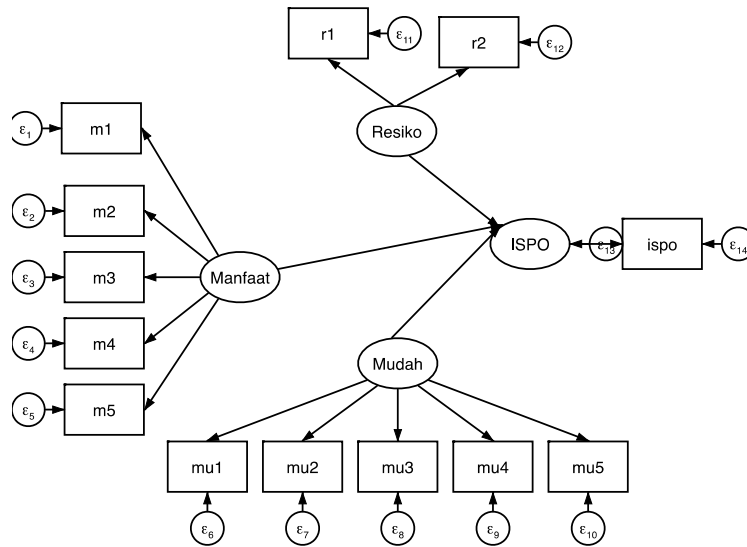


Figure 3. Initial model of ISPO implementation

In the final model [Figure 4], all factor loading values are above 0.7 considered to have sufficient size for a validity measurement, and the AVE value of all latent variables is greater than 0.50 showing a good discretionary validity [6] [Table 3]. This model is acceptable with a composite reliability value > 0.7.

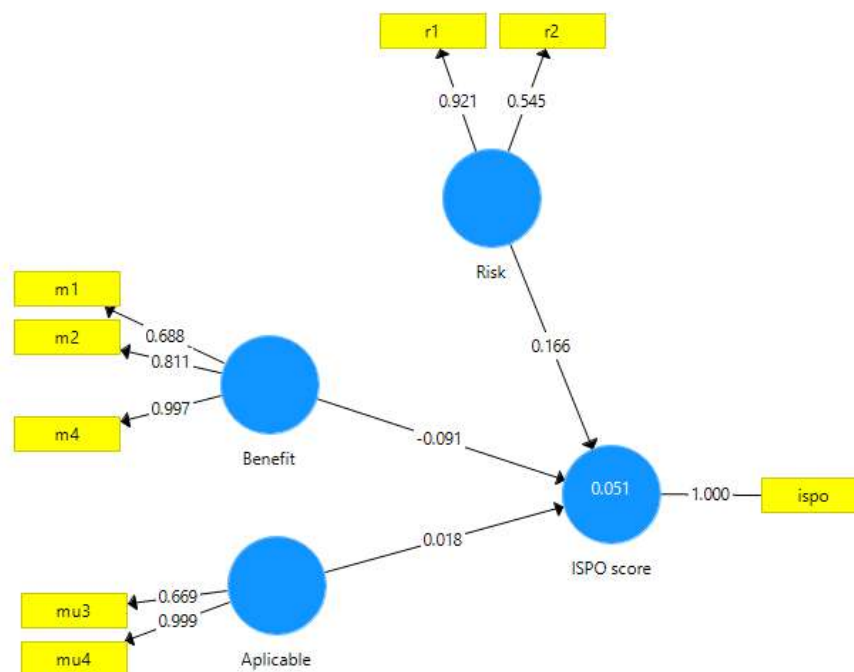


Figure 4. Final model of ISPO implementation

The *R-square value* is very low at 0.051, which means that the existing latent variable cannot explain the ISPO principle implementation score variation. Other important variables must be included

in the model. It also affects the f^2 value of ≤ 0.02 [Table 3]. The value of $f^2 = 0.02$ is considered to have a low influence [6].

Table 3. Model test results

Latent Variables	AVE	Composite Reliability	The path-Coefficient	f^2
Exogenous				
Benefits	0.708	0.877	-0.091	0.006
Ease	0.723	0.834	0.018	0.000
Risk	0.572	0.715	0.166	0.020

The Goodness of Fit of the Inner Model is measured by the Standardized Root Mean square Residual [SRMR] and Normed Fit Index [NFI] values. In this study, the SRMR value is 0.077, and the NFI value is 0.820 [Table 4], which indicates this model in moderate goodness of fit.

Table 4. Goodness value of fit final model implementation ISPO

Goodness of fit	Value
SRMR	0.077
NFI	0,820

The results showed that farmers' knowledge of ISPO certification did not affect ISPO implementation at the independent farmer level. This condition is likely due to the lack of farmers' perception of ISPO certification. Farmers have the same level of knowledge of ISPO certification. Moreover, the level of farm management does not vary from one farmer to another. All sample farmers are ex-plasma farmers who have the same level of knowledge about managing the farm.

Other studies [1, 4] found similar results that farmers have not yet implemented sustainable palm oil cultivation, causing adverse effects on the environment. Moreover, distrust from actors in the global supply chain contributed to ineffective ISPO implementation [8]. In contrast, palm oil generates a considerable economic value for the household [1] and ISPO certification can increase palm oil company's profit [11]. The proposed policy should encourage sustainable oil palm plantations characterized by synergistic relationships between legal, social, and financial aspects to provide optimal economic impact to the community and minimize adverse environmental impacts.

4. Conclusion

Farmers' understanding of the benefits and risks of ISPO is in the moderate category, while at ease is still low. The application of ISPO principles to farm legality and management is in a high category. In contrast, environmental management and sustainable business improvement are in a low category. The estimation results show that farmers' application of ISPO principles is not influenced by the farmer's knowledge of ISPO certification. Nevertheless, the application of ISPO principles by farmers is already in the moderate category that can improve.

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