

INTENTIONS AND BEHAVIOR OF PARTNER PALM OIL FARMERS PT HARI SAWIT JAYA ON SUSTAINABLE PALM OIL MANAGEMENT

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ABSTRACT

Sustainable palm oil management needs to be supported by all oil palm actors, both smallholders and oil palm plantation companies. PT Hari Sawit Jaya through the created share value program empowers independent smallholders around the company to become partner farmers to support a sustainable palm oil program. The present study aimed (1) to find out the factors that influence the intention of farmers to carry out sustainable palm oil management and (2) to determine the effect of intention on the behavior of partner farmers. The population was composed of partner farmers PT Hari Sawit Jaya located in Labuhan Batu district, North Sumatra of whom 90 farmers were sampled using the cluster proportional random sampling method. The research instrument was a questionnaire. Data was analyzed by SmartPLS. Results showed that attitudes, subjective norms, behavioral control, moral norms, and knowledge had a positive effect on farmers' intention to manage sustainable oil palm and the intention had a positive effect on farmers' behavior. However, there are sustainable palm oil management behaviors in accordance with good agricultural practices that have not been carried out by partner farmers to plant oil palm on peatlands and have not used certified seeds.

Keywords: Sustainable palm oil, intention and behavior of smallholders

INTRODUCTION

The agricultural sector is a sector that has an important role in the Indonesian economy. One of the sub-sectors that have considerable potential in the agricultural sector is the plantation sub-sector. Palm oil is a plantation sub-sector that plays a role in the Indonesian economy because it is a contributor to foreign exchange for the country. The rapid growth in palm oil production and trade has generated income and employment. This is because the management of palm oil still requires labor-intensive. At the same time, this growth has raised concerns about the negative environmental and social impacts of palm oil production. Environmental impacts associated with deforestation (deforestation) due to land use for oil palm cultivation. This causes the loss of biodiversity. Deforestation causes an increase in greenhouse gas emissions (Hospes, 2012). Processed products of Indonesian palm oil that have been successfully exported include CPO (crude palm oil) and PKO (Palm kernel oil). Each importing country has provisions related to the desired quality of products. One of the provisions is that the product must be a product that refers to food safety, is environmentally friendly, and is

produced by applying the concept of sustainability. Ngadi (2015) states that the implementation of sustainable oil palm plantations is oriented towards economic balance, which has an economic impact such as an increase in income, social balance related to social benefits such as employment, and ecological balance related to environmentally friendly conditions. One of the efforts set by the Indonesian government to obtain and ensure the sustainability of the Indonesian palm oil industry is through the standardization of palm oil sustainability, namely Indonesian Sustainable Palm Oil (ISPO). In addition, there is also a palm oil sustainability standard that is recognized by the international market, namely the Roundtable on Sustainable Palm oil (RSPO).

PT Hari Sawit Jaya is a palm oil plantation company located in Labuhan Batu Regency, North Sumatra that has been certified by the RSPO. The company through the created shared value (CSV) program empowers independent smallholders around the company to become the company's partner farmers. Brandi et al (2013) stated the challenges faced by farmers in applying the concept of sustainability, namely 1) technical challenges in implementing good agricultural practices in accordance with Good Agriculture Practices and 2) institutional challenges to access markets so that farmers have a better bargaining position, 3) challenges financially to adopt appropriate technology to meet certification standards and 4) compliance challenges with laws and regulations such as obtaining legal land ownership such as having land certificates. One of the efforts made by farmers to overcome obstacles to implementing sustainable agricultural practices is to become a partner farmers of the company in order to make it easier for them to manage palm oil by applying the concept of sustainability.

The application of palm oil management is inseparable from the intentions and behavior of farmers in managing palm oil. A person's intention towards a certain behavior can be formed from 3 aspects of the theory of planned behavior approach. Ajzen (2005) states that the theory of planned behavior (TPB) is a theory that explains that human behavior is influenced by 3 aspects, namely (1) belief which is the result of behavior, and an assessment of behavioral outcomes, (2) beliefs about expectations normative that comes from other people and the motivation to be able to follow these expectations (normative subjective), and (3) beliefs related to the presence of aspects that facilitate or limit behavior as seen from the ability in the form of resources to perform a behavior (perceived behavioral control). Maleksaedi's research (2019) adds two additional variables to influence behavioral intentions, namely knowledge, and moral norms. Referring to the theory of planned behavior, this study was conducted to determine the factors that influence the intention of partner farmers in sustainable palm oil management and the effect of intention on the behavior of farmers in sustainable palm oil management.

RESEARCH METHODS

The population was composed of 796 partner farmers PT Hari Sawit Jaya located in Labuhan Batu Regency, North Sumatra. The sample in this study amounted to 90 farmers consisting of farmer groups, namely Wahyu Agung, Block 3 1190, and Sei tarolat who used cluster proportional random sampling. Data was collected by means of interviews using a questionnaire. The questionnaire was used to obtain information related to the socio-economic character of the research respondents, and the factors that influence the intention of smallholders to carry out sustainable palm oil management (attitudes, subjective norms, control). perceived behavior, knowledge, and moral norms), and the behavior of sustainable oil palm management based on indicators of good agriculture practice (GAP). Data analyzed using smart partial least square. The variables used to measure the factors that influence partner farmers in managing

sustainable palm oil are 7 latent variables, namely attitudes, subjective norms, behavioral control, moral norms, intentions, and behavior.

RESULTS AND DISCUSSION

Demographics

The demographic characteristics of the respondents showed that the age of farmers is in the range of 25-80 years. As many as 91 percent of farmers are of productive age. Based on education level, the education level of partner farmers varies from elementary to undergraduate level. Based on the program that has been implemented by the government through 9 years of compulsory education, 55 percent of the total farmers have implemented the program. However, as many as 45 percent of farmers with elementary school education levels. Concerning the number of years in farming, 72 percent of partner farmers have more than 10 years of farming experience with a range ownership land area 1-21 Ha. As many as 76 percent of farmers own 1-3 Ha of land, and 24 percent have ownership of more than 3 Ha. Based on plant age, as many as 59 percent of farmers have plants that are still productive and 41 percent have plants that are no longer productive. Farmers who have unproductive palm oil choose to participate in the palm oil rejuvenation program.

Measurement Model Evaluation

Data analysis using Smart Partial Least Square consists of evaluating the measurement model and evaluating the structural model. The outer model test is described as below.

Table 1. Evaluation measurement model

Variable	Items	Loading Factor
Attitude	X1: sustainable palm oil management is more important than just focusing on sustainable palm oil production	0.877
	X2: I have a positive view of sustainable palm oil management because it is environmentally friendly	0.903
	X3: I have a positive view of sustainable palm oil management because it provides many advantages and benefits	0.923
Subjective Norm	X4: Government implements standardization of sustainable palm oil management system	0.933
	X5: The company implements a sustainable palm oil management system according to RSPO standards	0.822
	X6: The government supports the sustainable palm oil system, so I must also support	0.948
Behavior control	X7: Sustainable palm oil management systems reduce deforestation	0.962
	X8: palm oil management systems protect biodiversity	0.915
	X9: Sustainable palm oil management systems reduce greenhouse gas emissions	0.902
Moral Norm	X10: I am responsible for sustainable palm oil management	0.988
	X11: I am responsible for protecting the environment and biodiversity	0.981
	X12: I feel that sustainable palm oil management is a moral responsibility	0.984

Table 1. (Continued)

Variable	Items	Loading Factor
Knowledge	X13: I realize the importance of sustainable palm oil management	0.932
	X14: I know that sustainable palm oil management is more profitable	0.964
	X15: I know that sustainable palm oil management is environmentally friendly	0.952
Behavior	Y1 No clearing of land in primary forest	0.503
	Y2 Have carried out land and topographic surveys	0.291
	Y3 Selection of quality seeds	0.168
	Y4 Do not plant in steep, fragile, marginal areas, including peatlands	0.407
	Y5 Use the appropriate amount of fertilizer	0.888
	Y6 over-spraying herbicide	0.850
	Y7 makes efforts to maintain soil fertility (using soil cover)	0.274
	Y8 Establishment of irrigation to reduce erosion and adequate road access	0.823
	Y9 makes efforts to reduce chemical use, reduce waste, pollution, and greenhouse gas emissions	0.350
	Y10 Main crop maintenance	0.837
	Y11 Trimming	0.870
	Y12 Harvest preparation	0.876
	Y13 Harvest criteria	0.896
	Y14 How to harvest	0.891
	Y15 Harvest organization	0.875
	Y16 Freight	0.891

Source: RSPO (2015), H. Maleksaeidi (2019), Fadrudin, B (2020), Tama et al (2020)

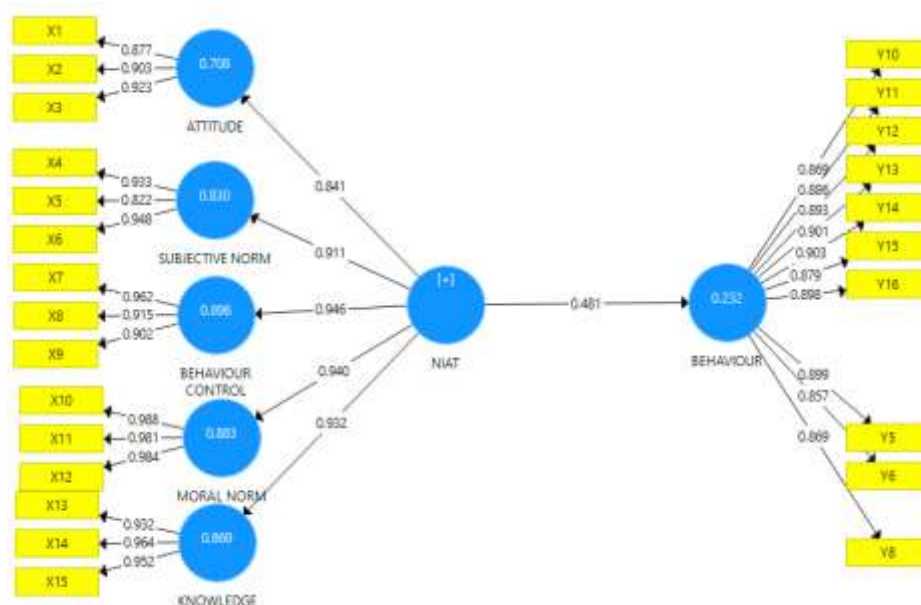
Based on the table above, the loading value is in the range of 0.168 to 0.896. According to the standard rules, Fornell, et al (1982) stated that the minimum value for loading is 0.7. If the loading value is <0.7 then the indicator is removed from the path diagram because the indicator has a low level of reliability and validity. Results Based on the results obtained, there are several indicators with loading values <0.7, namely indicators Y1, Y2, Y3, Y4, Y7, and Y9. These indicators are related to land clearing in primary forest, conducting soil and topographic surveys, selecting quality seeds, planting palm oil on peatlands, using peat cover, and making efforts to reduce the use of chemicals that will be removed from the model. The model used in this study is as shown in Figure 1.

Table 2. Measurement Model

Laten Variables	Average Variance Extracted	Cronbach's Alpha	Composite Reliability
Attitude	0.813	0.885	0.929
Subjective Norm	0.815	0.885	0.929
Behavior control	0.859	0.918	0.948
Moral Norm	0.969	0.984	0.989
Knowledge	0.901	0.945	0.965
Intention	0.731	0.973	0.976
Behaviour	0.784	0.969	0.973

Source: Processed Primary Data (2022)

After being removed from the model, the outer loading measurement value is in the range of The outer loading measurement criteria are > 0.7 . The AVE value has met the minimum standard > 0.5 . The AVE value indicates that the construct explaining the variance comes from the indicator. The results of Cronbach's alpha and composite reliability values have met the minimum requirements where the minimum requirements for composite reliability are > 0.6 and Cronbach's Alpha values are > 0.7 . Based on the measurement results above, it can be seen that the measurement of the value of internal consistency and convergent validity has been fulfilled so that an evaluation test of the structural model (inner model) can be carried out.



Source: Processed Primary Data (2022)

Figure 1. Measurement Model Evaluation

Structural Model Evaluation

Table 3. Coefficient Determination

Variables	R ²	R ² adjusted
Attitude	0.708	0.704
Subjective Norm	0.830	0.828
Behavior control	0.896	0.895
Moral Norm	0.883	0.882
Knowledge	0.869	0.868
Behaviour	0.232	0.223

Source: Processed Primary Data (2022)

Table 4. Path Coefficient

Hypothesis	Original sample	T statistic	P values
Intention-Attitude	0.841	19.384	0.000
Intention – Subjective Norm	0.911	20.782	0.000
Intention- Behavior Control	0.946	36.292	0.000
Intention-Moral Norm	0.940	35.777	0.000
Intention- Knowledge	0.932	28.573	0.000
Intention-Behaviour	0.841	4.202	0.000

Source: Processed Primary Data (2022)

Factors Affecting Farmers' Intention

Cohen (1988) states that the value of the coefficient of determination of 0.02 means that the variable has a small effect, a value of 0.15 means that the variable has a moderate effect, and a value of 0.35 means that the variable has a large influence. Based on the table above, the coefficient of determination of each variable has a value above 0.35 which means that the variables of attitude, subjective norms, behavioral control, moral norms, and knowledge have a strong influence. The coefficient of determination of the attitude variable is 0.708, which means that the attitude variable affects the intention of partner farmers by 70.8 percent, the subjective norm variable affects the intention by 83 percent, the behavioral control variable affects the intention by 89.6 percent, the moral norm variable affects the intention by 88.3 percent and the knowledge variable affects the intention. by 86.9 percent while the rest is influenced by other variables outside the research model. In addition, the path coefficient test was conducted to measure the influence between construct variables.

Based on the path coefficient value, all variables affect the intention of farmers to carry out sustainable oil palm management, and the best predictor that affects partner farmers' intentions to manage sustainable oil palm is the behavioral control variable of 0.946. The attitude variable affects farmers' intention by 0.841, meaning that for every 1% increase in attitude, it is significant to farmers' intention to carry out sustainable palm oil management by 0.841. Attitude is the view of farmers, either positive or negative views on sustainable palm oil management. The attitude variable shows that farmers have the intention to carry out sustainable palm oil management. The attitude shown by partner farmers is that they realize the importance of managing sustainable palm oil. In addition, farmers have a positive view of sustainable palm oil because it is environmentally friendly and has benefits for farmers. Zeweld et al (2017) and Tama et al (2020) showed that attitudes affect the intention to do sustainable agriculture.

The subjective norm variable affects the farmers' intention to manage sustainable palm oil by 0.911, meaning that every 1% increase in the subjective norm variable will significantly affect the farmer's intention by 0.911. Subjective norms are farmers' perceptions regarding the behavior of managing oil palm which is influenced by other people to carry out sustainable management. In this case, the perception is influenced by the government and companies related to the sustainable palm oil movement. The subjective norm shown by farmers is that they understand the importance of sustainable palm oil standards set by the government through companies, especially in order to create a better bargaining position, so that farmers are brought together to become partner farmers and join cooperatives and farmer groups as a forum for farmers to exchange information. Through cooperatives and companies, farmers get assistance to manage palm oil in a sustainable manner.

Behavioral control variables affect farmers' intentions by 0.946, which means that every 1% increase in behavioral control variables significantly affects farmers' intentions by 0.946. Behavioral control variables relate to farmers' perceptions of their ability to engage in

sustainable oil palm management. This variable shows that farmers are able to carry out sustainable palm oil management because farmers are aware that through sustainable palm oil they can reduce deforestation, protect biodiversity and reduce pollution such as burning land, and excessive use of herbicides and fertilizers that can damage the soil. Behavioral control is related to the farmer's perception of his ability to engage in sustainable oil palm management. Vicki, et al (2021) behavioral control consists of farming experience, knowledge, media, and technology and the role of outsiders has a significant effect on farmers' intentions by 62%. Regarding farming experience, partner farmers have quite a long experience in oil palm cultivation. As much as 72 percent of the total partner farmers have farming experience of more than 10 years. Long experience relates to the ease with which farmers accept the adoption of technology in oil palm cultivation. This is because the long experience makes farmers have a lot of experience and expertise in managing their farms. Regarding the role of parties outside of partner farmers, including the role of farmer groups, cooperatives, companies, and the government that supports farmers in managing sustainable palm oil. The company's roles include providing assistance to farmer groups through training, the company buying FFB (fresh fruit bunches) from partner farmers who use the Wahyu Agung cooperative delivery order, and the company providing assistance to support independent smallholders in sustainable palm oil management, such as infrastructure improvement assistance and paving roads for easy access roads, support for sustainable palm oil management such as providing owl cages, where 1 cage for a land area of 25 hectares is intended as a place for owls to live to reduce rat, house plants as plants used to reduce pests around agricultural land. In addition, the company also provided assistance in cleaning ditches and making rain houses. The roles of the cooperatives include acting as holders of delivery orders to import fresh fruit bunches (FFB) to companies, cooperatives as transportation providers to accommodate fresh fruit bunches from farmers to companies, cooperatives supporting sustainable palm oil management programs with GAP cultivation techniques, cooperatives as liaisons between farmers and companies, for example, if farmers want to buy fertilizer to the company they can order fertilizer through cooperatives at lower prices than farm shop prices. The role of the government through the sustainable palm oil program so that all oil palm actors, both companies and farmers, must support it. In addition, at the time of the research, the government through cooperatives received a smallholder palm oil rejuvenation program.

Moral norms affect farmers' intentions by 0.940, which means that every 1% increase in moral norms significantly affects farmers' intentions by 0.940. Moral norms relate to moral responsibility in managing sustainable palm oil. The moral norm shown is that farmers are aware that sustainable palm oil management can reduce deforestation and reduce pollution so farmers are aware of the importance of sustainable palm oil management. Ataei, et al (2020) showed that the variables of moral norms and attitudes had an effect of 52.2 percent to influence farmers' intentions and behavior. Knowledge variable also affects farmers' intentions. Knowledge affects farmers' intentions by 0.932, which means that every 1% increase in the knowledge variable will affect farmers' intentions to carry out sustainable oil palm management by 0.932. Bagheri et al (2019) state that knowledge is the most important variable that affects farmers' intentions. Knowledge mainly affects behavior control because, with good knowledge, farmers are aware of their ability and ability to carry out sustainable palm oil management. Farmer knowledge is related to the ability of farmers to carry out sustainable palm oil management in accordance with Good agriculture practices (GAP). Maleksaedi (2019) showed that the factors that influence farmers' intentions are attitudes, behavior control, subjective norms, knowledge, and moral norms.

To test the hypothesis, it can be seen from the Tstatistic value where the significance level value with the criteria (α) is 0.05 and the t table value is 1.66. If the value (α) < 0.05 and the t table value > 1.66 it means that the hypothesis is accepted and if the value (α) > 0.05 and the t table value < 1.66 then the hypothesis is rejected. Based on the table above, the factors that influence farmers' intentions are attitudes, subjective norms, behavioral control, moral norms, and knowledge. These factors have a positive effect on the intention of farmers to carry out sustainable palm oil management. This is indicated by the value (α) being smaller than 0.05 and the t table value being greater than 1.66.

The Effect of Intention on The Behavior of Partners Farmers

The path coefficient value generated by the intention to influence behavior is 0.841%, which means that a 1% increase in intention will affect behavior by 0.841. The intention to influence the behavior of partner farmers can be seen in the behavior of farmers. The behavior of farmers in managing sustainable palm oil is related to the implementation of Good agriculture practice (GAP) carried out by partner farmers. The application of good agriculture practice by farmers consists of 10 indicators including the use of appropriate fertilizers, reducing excessive spraying of herbicides, creating irrigation and erosion networks, maintaining disks, harvest roads, and yield collection points, carrying out plant maintenance, pruning trees, carrying out harvesting criteria and harvesting methods correctly, organizing harvests properly and transporting produce quickly.

The use of fertilizers carried out by partner farmers is the use of urea, MOP, and dolomite fertilizers. In addition, there are some farmers who have applied to choose to use compost because some farmers keep cattle in the area of land, where the grass on the land is used as fodder, thereby reducing the use of herbicides, and livestock manure is used as fertilizer. There are also farmers who use a bunch of ash as fertilizer. Maintenance of discs, harvest paths, and collection points is carried out by farmers by spraying and slashing. The herbicide used is Basta with a dose of 1-5 liters/Hectares, and the use of herbicides is relatively small because farmers also carry out clearing as an alternative to reduce the use of herbicides. Farmers consider that cutting down the costs incurred, is cheaper and does not damage the soil and the environment. Irrigation and erosion networks made by farmers are useful for holding water when it rains so as not to flood. Farmers through farmer groups, cooperatives, and the company cooperate in maintaining the ditches which are regularly cleaned.

Performing plant maintenance is carried out by farmers by conducting a census of unproductive plants and inserting new plants. Pruning is done by removing the midrib. The harvest criteria carried out by farmers are when the fresh fruit bunches are red and there are lollipops that fall to the disk and are harvested in the correct way, such as ripe FFB, cutting the stalks, placing the midribs in a dead pole, and placing the harvest in the collection point. Harvesting is done once in two weeks. At harvest time, farmers also carry out harvest organization both to harvest workers and to cooperatives. The farmer's harvest schedule usually consists of several farmers harvesting at the same time. Farmers who use the services of harvest workers are usually a wholesale system where harvest workers consist of 4 people to complete the land of 1 farmer, after that a group of harvest workers will work on other farmers' land. Harvest workers can work 2-4 fields per harvest cycle with harvest wages of IDR 200-350/kg depending on the area of the farmer's land. Tools for harvesting purposes are provided by workers. The harvested fresh fruit bunches (FFB) that have been collected at the collection point are then transported by the cooperative with the help of loading the fruit into trucks.

To test the hypothesis seen from the Tstatistic value. The hypothesis of intention to influence behavior is seen based on the value of the significance level with the criteria (α) 0.05

and the t table value of 1.66. Based on the table above, the Tstatistic value of intention to behavior is 4.202 where the Tstatistic value is greater than the t table value of 1.66 and the value (α) of 0.000 is smaller than (α) 0.005, then the hypothesis is accepted which means that the intention of sustainable palm oil management has a positive effect on behavior. farmers in carrying out sustainable palm oil management. This means that the higher the intention of partner farmers to manage sustainable oil palm, the behavior of sustainable oil palm management will also be higher.

CONCLUSION AND RECOMMENDATION

1. First point is factors that influence farmers' intentions (attitudes, subjective norms, behavioral control, moral norms and knowledge) have a positive effect on farmers' intentions to carry out sustainable palm oil management.
2. Second point is the intention of sustainable palm oil management has a positive effect on the behavior of farmers in managing sustainable oil palm.
3. Third point is the behavior of sustainable palm oil management has a positive effect on economic and environmental performance. However, there are sustainable palm oil management behaviors in accordance with good agriculture practices that have not been carried out by partner farmers, including planting oil palm on peatlands and not using certified seeds.

REFERENCES

- Ajzen I, Fishbein M. 2005. The influence of attitudes on behavior. In Albarracin, D, Johnson, BT, Zanna MP. (Eds), *The handbook of attitudes*, Lawrence Erlbaum Associates.
- Ataei, P., Gholamrezai, S., Movahedi, R., & Aliabadi, V. 2020. An analysis of farmers' intention to use green pesticides: The application of the extended theory of planned behavior and health belief model. *Journal of rural studies*. doi:10.1016/j.jrurstud. 2020.11.003
- Brandi, C., Cabani, T., Hosang, C., Schirimbek, S., Westermann, L., Wiese, H., 2013. Sustainability Certification in the Indonesian Palm Oil Sector: Benefits and Challenges for Smallholders. German Development institute Last Accessed 29 January 2021 https://www.diegdi.de/uploads/media/Studies_74.pdf
- Bagheri, A., Bondori, A., Allahyari, M. S., & Damalas, C. A. (2019). Modeling farmers' intention to use pesticides: An expanded version of the theory of planned behavior. *Journal of Environmental Management*, 248, 109291. doi:10.1016/j.jenvman.2019.109291
- Cohen, J. 1988. *Statistical power analysis for the behavioral sciences*. Amerika: Lawrence Erlbaum Associates
- Fachrudin, Budi et al. Analisis Penerapan Gap (Good Agricultural Practice) Dalam Pengelolaan Kebun Kelapa Sawit Pada PT Duta Reka Mandiri Desa Sungai Dua Kecamatan Rambutan Kabupaten Banyuwangi. *Jurnal AGRIPITA* Vol. 4, No. 2 Oktober 2020, hlm. 43-50. ISSN: 2580-0612 / EISSN: 27213552

- Hospes, Otto. 2012. 19th Annual Conference on Multi-Organisational Partnerships, Alliances and Networks Wageningen University
- Maleksaeidi, H., & Keshavarz, M. (2019). What influences farmers' intentions to conserve on-farm biodiversity? An application of the theory of planned behavior in fars province, Iran. *Global Ecology and Conservation*, 20, e00698. doi:10.1016/j.gecco.2019.e00698
- Ngadi, Mita Noveria. 2015. Keberlanjutan Perkebunan Kelapa Sawit Di Indonesia Dan Prospek Pengembangan Di Kawasan Perbatasan. *Masyarakat Indonesia* 43(1): 95-111.
- Tama, R. A. Z., Ying, L., Yu, M., Hoque, M. M., Adnan, K. M., & Sarker, S. A. (2020). Assessing farmers' intention towards conservation agriculture by using the Extended Theory of Planned Behavior. *Journal of Environmental Management*, 111654. doi:10.1016/j.jenvman.2020.111654
- Zeweld, W., Van Huylenbroeck, G., Tesfay, G., & Speelman, S. (2017). Smallholder farmers' behavioural intentions towards sustainable agricultural practices. *Journal of Environmental Management*, 187, 71–81. doi:10.1016/j.jenvman.2016.11.014
- Vicki, Nurliza, Dolorosa, E. 2021. Niat Perilaku Petani Sawit Swadaya Dalam Peningkatan Usaha Berkelanjutan Di Kabupaten Sambas Provinsi Kalimantan Barat. *SEPA : Vol. 18 No.1 September 2021*:112–124. DOI: <https://doi.org/10.20961/sepa.v18i1.4854>