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Behavioral Changes of Independent Palm Smallholders Farmers through Farmer Institution

Perubahan Perilaku Petani Kelapa Sawit Swadaya melalui Kelembagaan Petani

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ABSTRACT

Farmer institutions along with regulatory, normative, and cultural cognitive aspects have important roles in social cohesion to achieve the food security of independent palm smallholder farmer households. However, some dysfunctionalities and external challenges affect the structure of their institutions. This paper aims to find ways to change the behavior of independent palm smallholder farmers by identifying the internal and external factors of their behaviors in their institutions. The data were collected from 100 smallholders in West Kalimantan using Structural Equation Model (SEM). The results indicate that the internal factors do not influence farmers' behavior because of lack of social influences on their relationships, exceptional characteristics of the region, and a mismatch between perceived risk sources and risk management strategies. Meanwhile, the external factors (the surrounding environment, institutional information, the extension roles, ISPO, reward, and family encouragement) show positive influences on farmers' behavior. Therefore, to optimize the behavioral changes of independent palm smallholders in their institutions, knowledge exchange is necessary through formal or informal communication networks. Also, they need to have the connections with institutional buyers and potential agro-processing entrepreneurs and the connection with appropriate formal saving schemes, and financial products in their value chains.

Keywords: farmers' institutions, independent palm smallholders', internal and external factors of behavior

ABSTRAK

Kelembagaan petani memiliki peran penting dalam sosial kohesif bersama elemen kognitif regulasi, normatif, dan budaya untuk mencapai ketahanan pangan rumah tangga petani sawit swadaya. Namun, ada disfungsionalitas dan tantangan eksternal yang mengubah struktur institusi petani tersebut. Oleh sebab itu, tujuan penelitian adalah bagaimana mengubah perilaku petani sawit swadaya dengan menguraikan faktor internal dan eksternal perilaku dalam kelembagaan petani. Data diperoleh dari 100 petani sawit swadaya di Kalimantan Barat menggunakan wawancara mendalam dengan Model Persamaan Struktural (Structural Equation Modelling/SEM). Hasil penelitian mengkonfirmasi bahwa faktor internal tidak memiliki pengaruh karena pengaruh sosial tidak mempengaruhi hubungan antar petani dalam institusi, karakteristik wilayah, dan ketidakcocokan antara sumber risiko yang dirasakan dan strategi manajemen risiko. Sementara itu, faktor eksternal berpengaruh positif pada perilaku petani karena lingkungan sekitar, diikuti oleh informasi kelembagaan, peran penyuluhan, ISPO, penghargaan, dan dorongan keluarga. Oleh sebab itu, optimalisasi perubahan perilaku petani swadaya dalam kelembagaan memerlukan adanya pertukaran pengetahuan melalui komunikasi jaringan formal atau informal; hubungan dengan pembeli institusional dan pengusaha agro-processing potensial; hubungan dengan skema tabungan formal yang tepat dan produk keuangan dalam rantai nilainya.

Kata kunci: *kelembagaan petani, petani sawit swadaya, faktor internal and eksternal perilaku*

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INTRODUCTION

Independent smallholders in Indonesia are the key to sustainability because since 22.22 percent or 2.5 million hectares of all palm oil plantations in Indonesia are being managed by independent smallholders. However, independent smallholders have limited support in training and information on good agricultural practices and supervision from the government, companies, and financial institutions. Aware of the need to seek support, some the independent palm smallholders recently joined farmer institutions (i.e. farmer groups, cooperatives) to gain more information about government assistance programs for small-scale farmers.

Farmer groups have been acknowledged for their important role in increasing productivity and income, transforming farming practices, and changing the market orientation. It is also proven to have a positive relationship with household food security (Tolno et al., 2015; Rahmadanih et al., 2018), social cohesion with regulatory, normative, and cultural cognitive elements activities for social life stability (Janssen & Nonnenmann, 2017). It is also related to the performance and management practices (de Grip, 2015), particularly in informal learning processes of rural economic development (Marsick & Volpe, 1999; Dotcenko et al., 2016).

Behavioral changes in the farmer institutions will emphasize the formal organizations' actions in promoting the sustainability agenda, such as investing and financing practices, particularly in food supply chains (Glover et al., 2014). Understanding institutional change and economic behavior will provide benefits in recognizing the stability process of change (M. L. Baba et al., 2012); in optimizing the usage of innovation by managing information, mediating information, educating users, and driving business units (Prawiranegara et al., 2015; Janssen & Nonnenmann, 2017).

However, researchers identified dysfunctionality rates in the role of farmer institutions that stimulate excessive resistance of structural change due to interpersonal conflict. It is caused by management issues, personnel practices, work value structures (Beyers et al., 2008; Devon & Andrew, 2018), investment constraints (Tolno et al., 2015), and the obsolescence of institutional functions for complying to their members' preferences (de Miranda et al,, 2017). Besides, there are challenges in farmer institution structural changes, i.e. the question of whether and how they can adapt to these changes (Rezaei et al., 2017), internal and external factors of their members' behavior (Gray & Kraenzle, 2002; Balmann et al., 2006), and potential forces that against the adaptation (Nilsson, 1997; Jiotsa et al., 2015).

Therefore, this paper aims to identify the determinant factors that change the behavior of independent palm smallholders by elaborating on the internal and external factors that affect their behavior in their institutions. The result is expected to optimize the role of farmer institutions, particularly independent palm smallholders in obtaining supplies and services, enhancing rural living, improving efficiency, and providing information on effective workgroups and benefits of their members and communities (Gray, T. W., & Kraenzle, 2002).

METHODOLOGY

The research involved 100 independent palm oil farmers in Sambas Regency, West Kalimantan which are one of the highest numbers of independent palm smallholders that had the discrepancy of knowledge and competence levels (Nurliza et al., 2018; Nurliza, 2020). The data was collected in two steps. First, the researchers identified the characteristics of independent smallholders in farmer groups. These groups are initially rice farmer groups that had palm farms or converted their lands into palm farms (Sugiyono, 2003). Second, the researchers conducted an in-depth interview for completeness answer (Turner, 2010; Aboelmaged, 2018).

Next, the quantitative data was analyzed by applying the Structural Equation Model (SEM) using Lisrel software to test the hypothesis of the internal dan external factors in influencing independent palm smallholder behavior in their institutions. The internal factors that were being tested were age, education, participation level in the farmer institutions, farming experience, income, expense, and attitude (Baba et al., 2014; Tolno et al., 2015; Ullah et al., 2015; Mankad, 2016). Meanwhile, the

external factors that were being tested were family encouragement, environment, ISPO (regulation), reward, institutional information, and the role of extension (Baba et al., 2014; Tolno et al., 2015; Jiotsa et al., 2015; Nilsson et al., 2016; Coster et al., 2017; Linés et al., 2018).

Structural Equation Model (SEM) generated two models, i.e. the measurement model and the structural model. The first model produced convergent validity and discriminant validity while the second model produced predictive validity in these following steps (Sarwono, 2006): (1) specifying model based on theory; (2) qualifying model for causal relationships; (3) converting flowcharts into a series of structural equations and measurement model specifications; (4) selecting matrix input and estimating techniques of model; (5) testing the validity and reliability using construct reliability (CR) with the value of more than or equal to 0.70 and variance extracted (VE) with the value of more than or equal to 0.50 (Wijanto, 2008); testing the standardized loadings factor with the value of more than 0.70 (Rigdon & Ferguson, 1991) or more than 0.50 (Igbaria et al., 1997); (6) assessing the identified problem; (7) evaluating the model using the goodness of fit test; (9) re-specifying the model; (10) testing the goodness of fit for re-specification model; and (11) performing the interpretation model (Wijanto, 2008; Riadi, 2013).

RESULTS AND DISCUSSION

The Farmers' Characteristics

The findings show that independent palm smallholders' behavior in their institutions is determined by several factors, i.e. age, participation in farmer institutions, education, family members, playing jobs, income, and expense. Most of the smallholders are between 40 and 50-year-old. The palm smallholders' participation duration in their farmer groups is 24 years on average. Their educational backgrounds are between 6 and 9 years of formal school (graduate of elementary and junior high schools). Their family members are 3 people on average. Their main job is a farmer with a household income of less than and equal to 4,000,000 rupiahs per month. Their household expenditure is less than and equal to 1,500,000 rupiahs per month (see Table 1 in appendix).

Age reflected the smallholders' experience which usually brings knowledge (Lee et al., 2014) and social-influence effect on risk perception behavior (Hervé & Mullet, 2009; Knoll et al., 2017). Older farmers consulted and participated more widely and are more favored compared to the younger ones in their institution (Oshagbemi, 2004).

In group participation duration, the cooperative societies' role in collective action as social capital is weak (Gilson, 2003; Liang et al., 2015). This characteristic of group participation for improving household livelihood is in contrast to a prior study (Taruvinga & Fraser, 2009). Knowledge, training, and environmental policy information also play key roles in farmer activities (H. Liu & Luo, 2018). The adoption of information technology (Suvedi et al., 2017) through education and training (Sullivan-Wiley & Gianotti, 2018) can be an incentive for increasing the knowledge of independent palm smallholders (Lastra-Bravo et al., 2015).

In education, smallholders with higher education levels show better comprehension of knowledge advisories, sharing, and acting; faster and more often than those with lower education levels (Gowda & Dixit, 2015). The role of job values plays in occupational choices and behavior in work settings. The broadness and stability of educational, cultural, and individual factors (Parandeh et al., 2015) also prove to influence the smallholder level of institution values (Arieli et al., 2019).

Table 1. The farmers' characteristics

Charachteristics	Percentage (%)
Age (year):	
≤ 35	9
> 35 - 40	27
> 40 – 50	**53**
> 50	11
Participation in farmers' institution (year):	
24	**55**
25	35
26	10
Eduation (years):	
< 6	3
6	**36**
9	**36**
12	21
15	1
17	3
Family members (People):	
≤ 2	26
3	**31**
4	28
≥ 5	15
The main job:	
Farmer	**93**
Entrepreneur	4
Officer	3
Household income (Rp/month):	
≤ 4,000,000	**81**
> 4,000,000 – 6,000,000	16
> 6,000,000	3
Household expenditure (Rp/month):	
≤ 1,500,000	**82**
> 1,500,000 – 2,000,000	13
> 2,000,000	5

In education, smallholders with higher education levels show better comprehension of knowledge advisories, sharing, and acting; faster and more often than those with lower education levels (Gowda & Dixit, 2015). The role of job values plays in occupational choices and behavior in work settings. The broadness and stability of educational, cultural, and individual factors (Parandeh et al., 2015) also prove to influence the smallholder level of institution values (Arieli et al., 2019).

Then, household income was found to have a strong positive impact on household expenditure (Sekhampu & Niyimbanira, 2013) as lifestyle changes (Tamboto, 2015) which effects on decision making. Full-time smallholders with long farming experience and high education background become increasingly dependent on farm income (Al-Rimawi et al., 2006) due to the trade-offs and labor allocation (Bjornlund et al., 2019) for maximizing the total household income.

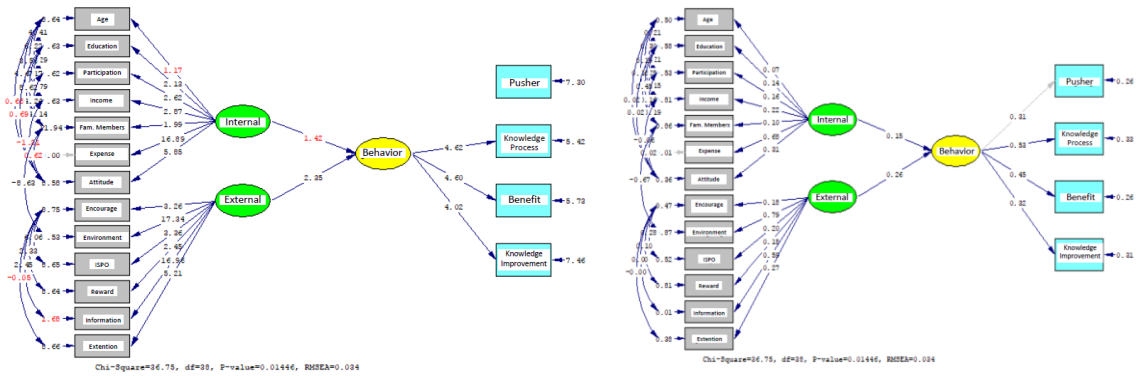
Independent Palm Smallholders' Behavior in Their Institutions

The finding was interpreted after conduct the goodness of fit test (see Table 2 in appendix) for identifying the significant factors in the model for structural change in farmers' institutions. In the goodness of fit test, the re-specification model of independent palm smallholders' behaviors in their institution proved that there were sixteen criteria in the GOF test which had a good fit (see Figure 1 in appendix).

Table 2. Goodness of fit test

GOF Criteria	Goodness of Fit Standard Value	Estimate	Conclusion
Chi Square (χ^2)	ρ ≥ 0,05	ρ = 0.011	marginal
χ^2/DF	1.0 ≥ x ≤ 5.0	1.241	good
NCP	Small value with narrow intervals	19.75 (7.59 ; 43.35)	good
SNCP (NCP/n)	Small value	0.519	good
RMSEA	≤ 0.08	0.034	good
ECVI	Small value and close to Saturated ECVI	1.12 (1.02 ; 1.28) S= 1.23 I= 5.94	good
AIC	Small value and close to Saturated AIC	M= 169.47 S= 178.42 I= 887.82	good
CAIC	Small value and close to Saturated CAIC	M= 404.96 S= 567.62 I= 935.93	good
NFI	≥ 0.90	0.90	good
NNFI	≥ 0.90	0.94	good
PNFI	≥ 0.90	0.65	poor
CFI	≥ 0.90	0.91	good
IFI	≥ 0.90	0.94	good
RFI	≥ 0.90	0.90	good
GFI	≥ 0.90	0.95	good
AGFI	≥ 0.90	0.90	poor
PGFI	0 - 1	0.37	good
RMR	≤ 0.05	0.018	good
CN	≥ 200	189.56	marginal

The unobserved variable or latent construct variable is independent palm smallholders' behavior (see Figure 1 in appendix) can be estimated through the observed variable or their indicators of internal and external factors. In the structural model, the internal factor has no significant influence. Contrary to Othman et al. (2012), the older age group has a lower essence of commitment for their institution performance.



(a) t-value (b) coefficient estimate

Figure 1. (a) t-value and (b) estimate coefficient of Independent palm smallholders' behavior in their institution

However, there is a positive influence on external factors. It means that external factors will increase the independent palm smallholders' behavior. The magnitude of the external factor's influence in the structural model (0.26) shows the changing contributions in smallholders' behavior. An increase in 1% of external factors lead to an increase in 0.26% of smallholders' behavior in their institutions. The contribution of the external factor on smallholders' behavior is presented in Table 3 in the appendix.

Table 3. The positive contribution of external factors on smallholders' behavior in their institution

External factor contributions	Percentage (%)
Family encouragement	66
Surround environment	56
ISPO	59
Reward	36
Institutional information	62
The role of extension	57

Education, participation in their institutions, farming experience, income, expense, and attitude have different levels in predicting internal factors because of the following reasons, i.e. social influences do not facilitate their relationship, exceptional characteristics of the region (Aggelopoulos et al., 2016), a mismatch between perceived risk sources and risk management strategies (Duong et al., 2019).

Family encouragement, surrounding environment, ISPO, reward, institutional information, and the role of the extension are important indicators in external factors that influence independent palm smallholders' behavior in their institutions. The highest influence of external factors is the environment (0.79), followed by institutional information (0.59), the role of extension (0.27), ISPO (0.20), reward (0.18) and family encouragement (0.18).

Farmers' responses to behavioral changes are source from the surrounding environment that generated from a combination of attitudes towards behavior, perception of others towards behavior (subjective norms), and the degree of control one thinks one has over the decision to carry out the behavior (perceived behavioral control) (Rehman et al., 2008). Meanwhile, social norms and uncertainty that are related to the importance scale of information and expected farm profits also play a role in decision-making (Liu et al., 2018). Thus, decision making in agriculture is becoming knowledge-intensive and increasingly complex (FAO, 2017).

On the other hand, smallholders face constraints on how to access markets and financial services, reduce the risks of human and physical capital, access information to improve their family livelihoods and society (Harvey et al., 2014). Therefore, the intervention programs that focus on strengthening independent palm smallholder institutions and innovation will stimulate change in farmers' behavior. It will also link social capital with stakeholders along with agricultural value chains (Kolade & Harpham, 2014; JI et al., 2018).

ISPO is a mandatory regulation for sustainable certification standards in Indonesia provides information that is in line with applicable provisions, particularly on the management and monitoring of the environment (Nurliza et al., 2019). Therefore, ISPO should be seen as a way to provide sustainable knowledge exchange activities and more than just simply providing information (Rose et al., 2018). Literature also confirms that the utilization of monetary incentives enhances performance through behavior changes in institutions (Bitzer, 2016). Ejembi & Obekpa (2017) stated that family encouragement and the environment will ensure the society to behave in line with their social structure and society's culture.

Therefore, knowledge exchange in social and institutional change needs to shift social norms and attitudes through formal or informal networks communication. It will increase their level of confidence and control in performing a particular behavior (Rose et al., 2018). Another way is to identify and create links with institutional buyers and potential agro-processing entrepreneurs to provide better prices for products and to ensure a steady market (Ferris et al., 2014; Dube et al., 2018);

links farmers to appropriate formal saving schemes (Agri-Profocus, 2011) and financial products that are suitable for their value chains (F&BKP, NpM, 2014; Consiglieri-Private-Limited, 2016).

CONCLUSIONS

Most of the independent palm smallholders are between the age of 40 and 50 years old with 24 years of membership in their institutions, having 6 and 9 years of education or elementary and junior high school graduates, and 3 people of family members. Their main job is a farmer with a household income of less or equal to 4,000,000 rupiahs per month. Their household expenditure is less and equal to 1,500,000 rupiahs per month. The results confirm that the internal factors do not have any influence on farmer's behavior in their institution because of less social influences in their relationships, exceptional characteristics of the region, a mismatch between perceived risk sources, and risk management strategies. However, the external factors have a positive influence on their behavior in their institution. The highest external influencer is the surrounding environment, followed by institutional information, the role of extension, ISPO, reward, and family encouragement. Therefore, behavior changes of independent palm smallholders in their institutions need the support of knowledge exchange through formal or informal networks communication, the linkages with institutional buyers and potential agro-processing entrepreneurs, link to appropriate formal saving schemes, and financial products in their value chains.

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