

Extended Abstract

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Paper/Poster Title	Understanding oil palm smallholders' behavior on oil palm diversification: A comparison of the Theory of Planned Behavior and the Value-Belief-Norm Theory
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Abstract	200 words max
<p>Interest in diversified mixed oil palm systems is increasing due to the increased efficiency of the use of land and the possibility of reducing farmer vulnerability through income diversification. Recent studies also support that diversification in oil palm plantations is possible and might provide ecological, environmental, and potential economic benefit. However, most plantations are still managed under a monoculture system. Focusing on smallholders, this study identifies how socio-psychological factors affect smallholders' intention to diversify their oil palm plantations. Using the Theory of Planned Behavior (TPB) and Value-Belief-Norm (VBN) theory, the study aims to determine which factors are the most important determinants of their intention toward diversification. Around 200 oil palm smallholders took part in the survey. Results show that constructs from both models have a positive influence on the intention to diversify. In addition, the TPB model has a stronger explanatory power than the VBN model in predicting the diversification behavior. Results from our study can contribute to the future formulation of development strategies and public policies to promote pro-environmental behavioural change in agriculture.</p>	
Keywords	Smallholders, oil palm, diversification, theory of planned behaviour, value-belief-norm theory
JEL Code	Q12, Q57
Introduction	100 – 250 words

Oil palm is typically cultivated in monocultures. This system is not considered environmentally sustainable due to the following problems such as increased GHG emission, soil compaction, erosion, and loss of biodiversity^{2,4,8}. Farm managers might cultivate oil palms in a diversified, relatively sustainable system as an alternative. Studies have proven that this pro-environmental behavior promotes many ecological, economic, and environmental benefits⁵, but diversified oil palm plantations are still less preferred.

TPB and VBN theories have been used to examine and identify the key factors of Behavioral change^{3,6}. TPB posits that intentions can be predicted from attitudes toward the behavior (Att), subjective norm (SN), and perceived behavioral control (PBC)¹. VBN posits that behaviors flow from three factors: Acceptance of particular personal values (V), beliefs that things important to those values are under threat (B), and beliefs that actions initiated by the individual can help alleviate the threat and restore the values (N). The factors are structured as a causal chain of variables: New environmental paradigm (NEP), awareness of consequences (AC), ascription of responsibility (AR), and personal norm (PN)⁷.

This study aims to conjunctively use TPB and VBN theory to empirically examine the determinants of oil palm smallholders' intentions toward diversification. The main objectives are:

1. To determine the most important determinants influencing smallholders' intention to diversify their oil palm plantation.
2. To evaluate and compare the predictive power of both theories in the context of oil palm diversification behavior of smallholder farmers.

Our study uses both models because pro-environmental behaviour, such as diversification in oil palm plantations, is contributed from the combination of rational (more self-interest oriented) and moral (more altruistic) conditions.

Methodology

100 – 250 words

This cross-sectional study involves oil palm smallholder farmers in Indonesia. Using stratified random-sampling method, 200 smallholder farmers were interviewed in person in one-on-one sessions. The questionnaire contained questions on socio-demographic characteristics, farm management and financial related questions, and Likert-scale items to measure the constructs of both the TPB and VBN models.

TPB constructs include Att (3 Likert-scale items), SN (3 items), PBC (3 items) and Behavioral Intention (2 items). VBN constructs include NEP (3 items), AC (3 items), AR (3 items, and PN (2 items). The constructs will be treated as latent variables. Data will be analyzed with Partial Least Square – Structural Equation Modeling (PLS-SEM) using the SmartPLS 4.0 software. PLS-SEM allows estimation of complex cause-effect relationships in path models with latent variables.

Steps for the analysis include⁹ assessing the reliability (Cronbachs alpha) and validity (values of average variance) of evaluated measurement models and evaluating measures of fit of structural models (coefficient of determination (R^2), crossvalidated redundancy (Q^2), effect size (f^2) and path coefficients).

Results (expected)	100 – 250 words
<p>We expect that constructs of both TPB and VBN models to positively influence the intention to diversify their oil palm plantation</p> <p>H1: Smallholders' attitude towards diversification positively influences the intention to diversify their oil palm plantations</p> <p>H2: Smallholders' subjective norm positively influences the intention to diversify their oil palm plantations</p> <p>H3: Smallholders' perceived behavioural control positively influences the intention to diversify their oil palm plantations</p> <p>H4: Subjective norm has a stronger explanatory power compared to attitude and perceived behavioural control</p> <p>H5: Smallholders' new environmental paradigm positively influences the intention to diversify their oil palm plantations</p> <p>H6: Smallholders' awareness of consequences positively influences the intention to diversify their oil palm plantations</p> <p>H7: Smallholders' ascription of responsibility positively influences the intention to diversify their oil palm plantations</p> <p>H8: Smallholders' awareness of consequences has weaker predictive power compared to new environmental paradigm and ascription of responsibility</p> <p>In addition, we compare the explanatory power of TPB and VBN theory to explain both intention and current oil palm management practices.</p> <p>H9: The TPB will have a higher explanatory power of explaining smallholders' intention to diversify their oil palm plantations compared to the VBN theory</p> <p>H10: The TPB will have a higher explanatory power of explaining smallholders' oil palm diversification behaviour compared to the VBN theory</p>	
Discussion and Conclusion	100 – 250 words

Both the TPB and VBN theories have been used extensively in the research field of sociopsychological constructs for environmental attitudes. TPB generally predicts self-interested behaviour better, while VBN is a better model for explaining altruistic behaviour. In our study, we focus on the diversification behavior of oil palm smallholders. Diversification has benefits for the smallholders themselves, but also potentially provide more ecosystem services. Using the two models allows us to identify how smallholders evaluate the possibility of diversifying agricultural production on their farms, verify the social pressure they perceive to diversify their production, and identify smallholders' perception of their ability to diversify their farms. In addition, it also examines how smallholders value the behavior and to what extent moral norms play a role in their intentions.

Many studies have proven the positive ecological and environmental impact, technical possibility, and cost-benefit of having a diversified oil palm plantation. However, the decision still lies in the hands of the farm managers. Identifying which factor is the most critical determinant influencing smallholders' intention to diversify their oil palm plantation could contribute to important implications to policymakers promoting efficient behavioural changes in agriculture, specifically oil palm cultivation in our case.

References

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