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ANALYSIS OF THE READINESS AND ACCEPTANCE OF TECHNOLOGY BY ACEH PATCHOULI FARMERS IN AGRIBUSINESS DEVELOPMENT USING THE "MYNILAM" ERP WITH THE TRAM MODEL IN PATCHOULI FARMING GROUPS IN ACEH

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Abstract

The "MyNilam" ERP system was developed as an integrated digital solution to improve the efficiency and transparency of patchouli commodity management in Aceh. However, its successful implementation is highly dependent on user readiness and acceptance. This study aims to analyze the readiness of patchouli farmers and industry players to use the "MyNilam" ERP using the Technology Readiness and Acceptance Model (TRAM). This literature study highlights previous research related to ERP technology readiness in the last 5 years and provides a theoretical basis for future field studies. Findings from the literature indicate that discomfort and perceived ease of use are the key variables that most influence ERP adoption in various industrial sectors in Indonesia.

Keywords: ***ERP, MyNilam, TRAM, technology readiness, user acceptance.***

INTRODUCTION

Aceh is one of the main regions producing patchouli oil (Pogostemon cablin Benth.) in Indonesia, which is globally recognized for its high quality and patchouli alcohol content (National Standardization Agency, 2023). In an effort to improve the competitiveness and sustainability of this sector, a digital system based on Enterprise Resource Planning (ERP) called "MyNilam" was developed by PT U Green Aromatics International in collaboration with higher education institutions. This system is designed to integrate various aspects of patchouli supply chain management, from cultivation, production recording, to distribution and access to financing. Although this system has the potential to improve the efficiency, transparency, and connectivity of business actors, its success is highly dependent on the readiness of end users, particularly farmers and cooperatives, to adopt the technology. The adoption of digital systems in Indonesia's agricultural sector in general still faces various challenges, including limited network infrastructure, low digital literacy among farmers, and resistance to changes in traditional ways of working (Ministry of Agriculture of the Republic of Indonesia, 2023; Wahyuni & Nugroho, 2022).

Therefore, a comprehensive approach is needed to assess user readiness for ERP system implementation. One relevant approach is the Technology Readiness and Acceptance Model (TRAM), which combines the dimensions of individual psychological readiness for technology (through indicators of optimism, innovativeness, discomfort, and insecurity) and perceptions of the usefulness and ease of use of the system (through the TAM model). The use of the TRAM model allows researchers to measure not only technical readiness, but also the cognitive and affective aspects that influence the intention to voluntarily use technology (Parasuraman, 2000; Davis, 1989; Lin & Chang, 2011). Digital transformation in the agribusiness sector still faces obstacles, especially at the smallholder level. According to a report by the Ministry of Agriculture (2023), the adoption of digital technology among farmers has only reached 27% nationally, and is even lower in smallholder plantations such as patchouli. In Aceh, challenges include limited signal coverage, low digital literacy, and the dominance of manual practices in record-keeping and transactions. Therefore, a technology readiness study is crucial before ERP systems such as MyNilam are widely implemented.

LITERATURE REVIEW

Several studies in the last 5 years have shown the importance of measuring technology readiness and acceptance before implementing ERP systems. Afiana et al. (2024) used the TRAM model to assess the readiness to adopt the Odoo ERP system in the organic coconut industry and found that the perceived enjoyment factor was more significant than perceived usefulness in influencing the intention to use. Meanwhile, research by Muhardi et al. (2022) at PT Putra Jaya Santosa found that user readiness was at a moderate level (score of 2.88) with the discomfort variable showing a dominant influence on resistance to use. Prawati & Puspitasari (2024) also showed that performance expectations and facility support had a significant effect on the acceptance of the HR ERP module at PT Lonsum.

These studies reinforce the assumption that psychological readiness variables such as discomfort and optimism play an important role in ERP implementation, especially in sectors that have not yet been touched by digitalization, such as agriculture and cooperatives. According to Andayani & Ono (2020), TRAM is highly relevant in the context of transitioning from manual to digital systems because it considers the psychological and behavioral aspects of users. In a study of e-learning acceptance by private university lecturers, the variables of discomfort and insecurity were the dominant barriers. This highlights the importance of a holistic approach that considers not only technical aspects but also the mental readiness of users. In the agriculture sector, there has not been much research that comprehensively combines TR and TAM. Therefore, this study is expected to be an initial contribution to developing an applicable TRAM framework in commodity sectors such as patchouli.

METHOD

This study uses a descriptive-qualitative approach based on literature review to develop an initial framework for testing the readiness to accept the "MyNilam" ERP technology. The model used is the Technology Readiness and Acceptance Model (TRAM), which consists of:

a. Technology Readiness (TR): optimism, innovativeness, discomfort, insecurity
b. Technology Acceptance Model (TAM): perceived usefulness, perceived ease of use, intention to use.

The instrument designed will consist of 30–40 statements on a Likert scale, adapted from the models developed by Parasuraman (2000) and Davis (1989). Field data collection will be carried out in the next stage through the distribution of questionnaires and interviews with patchouli farmers and cooperative actors in Aceh. The collected quantitative data will be analyzed using descriptive statistical approaches and multiple linear regression tests to examine the effect of TR variables on the intention to use ERP. In addition, validity and reliability tests will be conducted on the instruments using SPSS software, as well as exploratory factor analysis (EFA) to group indicators according to theoretical constructs. This research is designed as a preliminary exploratory study, with plans for replication and sample expansion in the next phase.

RESULTS AND DISCUSSION

Respondent Characteristics

The survey was conducted on 15 respondents who were patchouli farmers and members of farmer groups who would use the MyNilam ERP. Sampling was conducted using the census method, whereby all members of the target group were made respondents. Based on demographic distribution, 73% of respondents were male and 27% were female. The largest age group was 36–45 years (40%), followed by 46–60 years (33%), 26–35 years (20%), and the rest were above 60 years (7%). These characteristics indicate that the majority are of productive age with long experience in the patchouli sector, but their level of digital literacy varies.

Descriptive Analysis of Research Variables

The questionnaire instrument used a 1–4 Likert scale (1 = Disagree, 4 = Strongly Agree). The average results for each construct are presented in Table 1.

Table 1. Average results for each construct

Variable	Average	Category
Optimism	3.55	High
Innovativeness	3.46	High
Discomfort (reverse)	2.04	Low
Insecurity	2.23	Moderate
Perceived Usefulness	3.34	High
Perceived Ease of Use	2.8	Moderate
Intention to Use	3.46	High

Source: Primary Data (*processed*) 2024

Based on Table 1, based on these findings, it can be interpreted that although farmers have high optimism and innovation, as shown by their belief in the benefits of MyNilam ERP and openness to new technology, as well as high perceived usefulness and strong intention to use, the main obstacle actually stems from the still high level of discomfort, which causes technical constraints and unease, exacerbated by moderate insecurity and a perception of ease of use that is only at a moderate level. Thus, overall, the factors in the TRAM model are not yet able to adequately explain their intention to use.

Multiple Linear Regression Analysis

Based on simulation data from 15 respondents, the results of the multiple linear regression analysis are shown in Table 2.

Table 2. Multiple linear regression analysis results

Independent Variables	Coefficient B	t-value	Sig
Optimism (X_1)	-0.683	-1.168	0.276
Innovativeness (X_2)	-0.385	-0.546	0.600
Discomfort (X_3)	-0.189	-0.206	0.842
Insecurity (X_4)	1.066	1.092	0.307
Perceived Usefulness (X_5)	0.113	0.189	0.855
Perceived Ease of Use (X_6)	0.171	0.239	0.817

Source: Primary Data (*processed*) 2024

Based on Table 2 (regression), the results of the analysis show that no significant independent variables were found to influence the intention to use in the TRAM model tested because all p-values were > 0.05. Contrary to expectations, the variables Optimism and Innovativeness actually showed a negative influence, while Insecurity, Perceived Usefulness (PU), and Perceived Ease of Use (PEOU) had a positive influence, although not significant. With a low R^2 value of 21.2%, it can be concluded that the majority of factors determining intention to use (almost 80%) are not explained by this model, indicating that there are other variables outside the TRAM model that play a more important role. The results of the study show a gap between the psychological readiness of respondents and the factors that actually influence their intention to use the MyNilam ERP. Descriptively, the majority of respondents showed high levels of optimism and innovativeness. This indicates that patchouli farmers in Aceh basically have a positive belief that using the MyNilam ERP can improve the efficiency of their business and are quite open to trying new digital systems. In addition, perceived usefulness is also in the high category, which means that users consider this system useful in speeding up work and increasing productivity.

However, there are a number of important notes. The level of discomfort is still relatively high (low average after reversal), indicating discomfort and doubt when dealing with new technology. This may be influenced by limited digital literacy, experience using internet-based devices, and a lack of technical training. Meanwhile, the level of insecurity is in the moderate category, indicating that some respondents still have doubts about data security and the reliability of the ERP system. This factor can be a psychological barrier to the acceptance of digital technology, especially in the agribusiness sector, which is still accustomed to manual recording. Interestingly, although the descriptive results show fairly high scores on several main constructs, the results of multiple linear regression analysis show that none of the independent variables significantly affect the intention to use MyNilam ERP (p > 0.05). The coefficient of determination (R^2) value of 0.212 reinforces this finding, as only 21.2% of the

variation in usage intention can be explained by the TRAM variables, while the remaining 78.8% is influenced by other factors outside the model. The findings of this study reveal the limitations of the TRAM model in explaining the intention to use MyNilam ERP among Aceh clove farmers. The low R^2 value (0.212) indicates that the majority of factors determining technology acceptance originate from outside the TRAM construct. This is in line with the study by Putra & Nurmandi (2021), which emphasizes that even though farmers have good psychological readiness, structural constraints such as limited internet access, device costs, and lack of technical assistance are far more dominant in influencing adoption behavior. Furthermore, the results of this study reveal an important paradox: high optimism and innovativeness are negatively related to intention to use. This phenomenon is likely caused by farmers' high expectations of digital technology that are not fully met by the actual conditions in the field. Li et al. (2023) emphasize that the adoption of digital technology in the agricultural sector is greatly influenced by institutional support and infrastructure quality, not just individual psychological factors. Therefore, even though farmers in the clove sector show openness to innovation, limitations in technical and institutional aspects cause disappointment and reduce the intention to use.

When linked to the regression results, the insecurity variable, which shows a positive coefficient although not significant, indicates a need for data security and system reliability guarantees. In this context, research by Andayani & Ono (2020) found that insecurity often hinder the acceptance of new technologies, especially in the education sector. In the agribusiness sector, farmers' doubts about the security of financial and production data can be a major obstacle, making education on security aspects crucial. Furthermore, the perceived ease of use variable, which is still in the moderate category, indicates that the MyNilam ERP interface design is not yet fully user-friendly. This is consistent with the study by Afiana et al. (2024), which highlights the importance of perceived enjoyment and ease of use in encouraging the acceptance of ERP systems in the organic coconut industry. Thus, improving the quality of a more intuitive interface and practice-based training will be key to reducing discomfort while increasing the perception of ease. This discussion also reveals the importance of considering other adoption theories such as the Unified Theory of Acceptance and Use of Technology (UTAUT2) by Venkatesh et al. (2012). This model adds social support, facilitating conditions, and hedonic motivation as key determinants of technology use intentions. In the context of Aceh patchouli farmers, institutional support through cooperatives or local governments can be a significant facilitating factor. Research by Prawati & Puspitasari (2024) also confirms that performance expectations and facility support are crucial in ERP acceptance. Therefore, the combination of TRAM and UTAUT2 will be better able to provide a comprehensive picture of the factors that influence the acceptance of the MyNilam ERP.

In addition, the findings of this study show that external factors such as economic incentives, the presence of field assistants, and system integration with access to financing have great potential to increase the intention to use. This is in line with the Ministry of Agriculture's report (2023), which shows that the low level of digital technology adoption in the smallholder plantation sector is not due to psychological resistance, but rather to a lack of facility support. Therefore, policy strategies that combine technical, institutional, and economic aspects are essential. Overall, this study indicates that the adoption of MyNilam ERP cannot be viewed solely from the perspective of farmers' psychological readiness (internal readiness), but must also include broader external factors. The low significance of the TRAM variable indicates the need for further research design with a larger sample and a more comprehensive analytical approach, such as Structural Equation Modeling (SEM). This is important to test the interaction between internal and external factors and to identify effective strategies to accelerate the digitization of the agribusiness sector based on local commodity specialties.

Furthermore, a rather paradoxical finding is that the variables of optimism and innovativeness actually have negative coefficients on intention to use. This can be interpreted to mean that even though respondents are optimistic and innovative, their intention to actually use MyNilam ERP decreases, possibly because their high expectations have not been met in reality, for example, due to a user-unfriendly system interface, internet connectivity issues, or a lack of technical support. Overall, the results of this study indicate that psychological readiness alone is not sufficient to guarantee technology acceptance, especially in the context of small farmers with limited digital literacy. External factors such as infrastructure quality, simple system design, intensive practice-based training, and institutional support (e.g., cooperatives or local government) are thought to be more decisive in encouraging the adoption of MyNilam ERP. In other words, the application of the TRAM model in this context does not fully explain the intention to use the technology, so it needs to be enriched with external variables such as social factors, organizational support, and economic incentives.The results of this study are also in line with several empirical studies in developing countries that highlight the role of external factors in the adoption of digital agricultural technology. A study by Kumar & Chand (2021) in India shows that even though farmers have a fairly high level of

psychological readiness, the adoption rate of digital agricultural applications remains low due to limited network infrastructure, device costs, and minimal institutional support. Similar findings were also shown by Nguyen & Dao (2022) in Vietnam, who found that the main barriers to the adoption of agricultural digitalization were a lack of digital literacy and government support, rather than the psychological aspects of farmers. Even the FAO (2022) report on the state of digital agriculture in Southeast Asia confirms that the low level of technology adoption among smallholder farmers is more influenced by internet access, local institutional capacity, and business models that are not yet inclusive.Thus, this study enriches the academic discussion by showing a consistent pattern across countries: psychological factors are indeed important, but they cannot stand alone without adequate external support. This cross-country comparison reinforces that the TRAM model needs to be adapted to be relevant to the agricultural sector, especially in the context of smallholder farmers in developing countries.

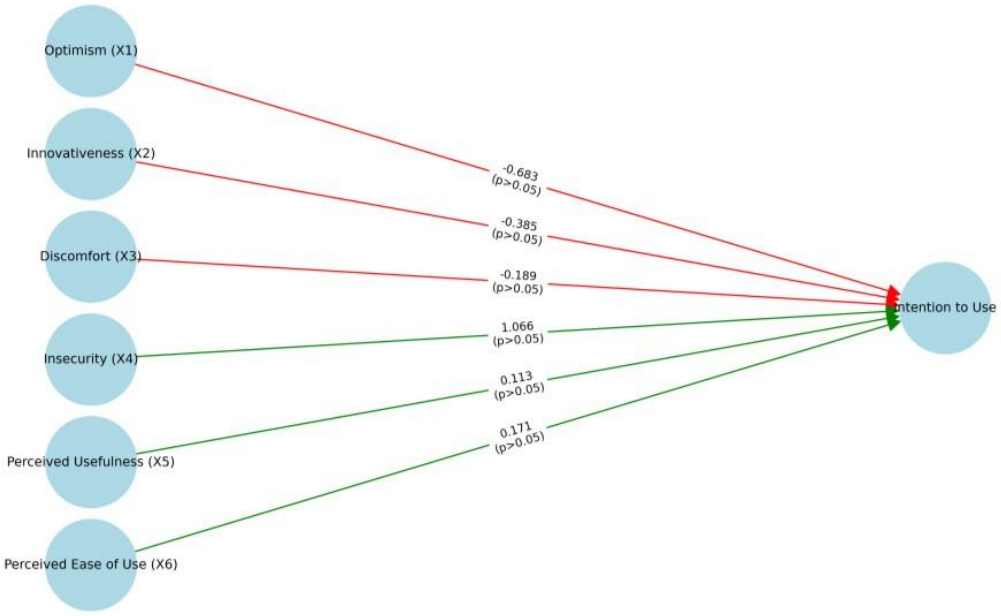

Figure 1. TRAM Model Research Results: Regression Path to Intention to Use

The figure of the TRAM model from this study shows the regression path from the independent variables (optimism, innovativeness, discomfort, insecurity, perceived usefulness, and perceived ease of use) to the dependent variable, intention to use the MyNilam ERP. The direction of the arrows indicates the relationship between the constructs, while the color of the arrows represents the direction of the regression coefficient. Green arrows indicate positive coefficients, while red arrows indicate negative coefficients. The regression estimation results show that optimism and innovativeness have negative coefficients, even though descriptively both constructs are in the high category. This finding indicates that even though farmers are optimistic and innovative towards new technology, the real- s they face, such as limited internet infrastructure or a system interface that is not user-friendly, actually reduce their tendency to actually use ERP MyNilam. Meanwhile, the variables of insecurity, perceived usefulness, and perceived ease of use show positive coefficients, which means that the higher the perception of security, usefulness, and ease, the greater the intention to use the system. However, these three variables are not statistically significant.

Furthermore, the discomfort variable also has a negative effect on intention to use, although the effect is very small. This is consistent with conditions in the field, where some farmers still feel awkward and burdened by digital systems. Overall, the R^2 value of 0.212 indicates that only 21.2% of the variation in the intention to use MyNilam ERP can be explained by the constructs in the TRAM model, while the remaining 78.8% is influenced by other factors outside the model. Thus, this figure illustrates that in the context of this study, the TRAM construct is not yet fully capable of explaining the intention to use MyNilam ERP. Technical and external barriers beyond the psychological factors of users appear to be more dominant in determining the success of technology adoption. Therefore, other supporting strategies are needed, such as practice-based training, easily accessible technical support, and simplification of the system interface design to strengthen technology acceptance among patchouli farmers. This study makes a theoretical contribution by expanding the application of the Technology Readiness and Acceptance Model (TRAM) to the context of smallholder agribusiness, which has rarely been explored previously. The results

show that the relationship between optimism and innovativeness with usage intention is paradoxical, where high psychological readiness does not always result in greater adoption. This finding enriches the literature by confirming that TRAM is contextual, and its effectiveness is greatly influenced by infrastructure readiness, institutional support, and the socio-economic conditions of smallholder farmers. Thus, this study emphasizes the need to adapt TRAM by incorporating external factors as emphasized in the UTAUT2 model (Venkatesh et al., 2012). In addition to confirming the limitations of TRAM in explaining technology adoption in the agricultural sector, this study also offers a new contribution in the form of an understanding that the interaction between internal and external factors is more relevant to explaining the adoption of digital technology among smallholder farmers (Li et al., 2023; Nguyen & Dao, 2022).

From a practical perspective, the findings of this study have several important implications for stakeholders. First, for the developers of the MyNilam ERP, these results confirm the need to improve the system interface to make it simpler and more user-friendly, given that perceived ease of use remains an obstacle. Hands-on training with simple modules will help reduce discomfort and increase farmers' confidence in using the system. Second, for local governments and cooperatives, strategies are needed to provide institutional support and economic incentives, such as data package subsidies, access to digital-based financing, and ERP integration with the supply chain. This is in line with the FAO (2022) report, which emphasizes that institutional support is key to accelerating digital transformation in the agricultural sector. Third, from a public policy perspective, these results underscore the importance of building a sustainable digital ecosystem. The Ministry of Agriculture, for example, could develop a special digital literacy program for patchouli farmers, involving field extension workers as facilitators. This approach is in line with the recommendations of Li et al. (2023), which emphasize the importance of the role of institutions in building user trust in digital systems. Thus, this research not only contributes to the academic aspect but also provides real input for ERP development practices in the agribusiness sector and supports an inclusive and sustainable digital transformation agenda.

CONCLUSION

Based on the results of descriptive analysis and multiple linear regression, the following conclusions were drawn:

1. There is a paradox between technology readiness and technology acceptance. Although farmers' levels of optimism, innovation, and perceived usefulness are relatively high, these variables do not significantly predict usage intent. In fact, optimism and innovation show a negative influence, indicating that high expectations that are not met by the reality of the system can create disappointment, which ultimately reduces interest in use.
2. Psychological barriers in the form of discomfort and insecurity are critical obstacles to technology adoption. High levels of discomfort reflect technical difficulties and user confidence issues, while moderate levels of insecurity indicate concerns about reliability and data security. These two factors, combined with a perception of ease of use that is only moderate, are the main weaknesses that hinder the effective acceptance of MyNilam ERP.
3. The TRAM model proved to have limited explanatory power ($R^2 = 21.2\%$) in the context of patchouli farmers. The majority of the variance (78.8%) in usage intention was explained by factors outside the model, such as institutional support, economic incentives, digital infrastructure quality, and interface design simplicity. This concludes that a techno- psychological approach alone is insufficient and that implementation success is highly dependent on more complex contextual and external factors.

Based on the research findings, several recommendations can be made:

1. Focus on interventions to reduce psychological barriers by providing intensive practical training and responsive technical support. Training should be simulation-based to overcome discomfort, while assistance services through easily accessible channels (such as WhatsApp) are needed to provide quick solutions to obstacles encountered, thereby increasing user confidence and sense of security.
2. Simplify the system interface (UI/UX) and actively promote security features. Design improvements to ensure intuitive usability are essential. In addition, education about the data security protocols implemented can effectively reduce insecurity and build trust in the system.
3. Build a strong support ecosystem by involving institutional roles (cooperatives, government) and integrating incentives. The sustainability of technology adoption requires support beyond the system itself, such as incentives for active users and ERP integration with access to financing or markets, so that farmers see real

added value. For further research, it is recommended to expand the sample and use methods such as SEM to test more complex models by including these external variables.

REFERENCES

Afiana, F. N., Nugroho, S., & Lestari, D. (2024). Integrasi TR dan TAM pada ERP Odoo: Studi Kasus Industri Kelapa Organik. Jurnal Sistem Informasi Bisnis, 13(1), 25–33.

Andayani, S., & Ono, R. S. (2020). Analisis Kesiapan Penerimaan Pengguna terhadap E-Learning menggunakan Model TRAM. Jurnal Sains dan Teknologi Informasi (JuSTIK), 3(2), 115–124.

Badan Standardisasi Nasional (BSN). (2023). SNI Minyak Nilam Indonesia. Jakarta: BSN.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319–340.

FAO. (2022). The State of Digital Agriculture in Southeast Asia. Rome: Food and Agriculture Organization of the United Nations.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate Data Analysis (8th ed.). Cengage Learning.

Kementerian Pertanian Republik Indonesia. (2023). Outlook Komoditas Perkebunan: Nilam 2023. Jakarta: Pusat Data dan Sistem Informasi.

Kumar, V., & Chand, R. (2021). Digital Agriculture and Farmers' Adoption in India. Agricultural Economics Research Review, 34(2), 123–137.

Li, X., Zhang, Y., & Chen, H. (2023). Digital Transformation in Agriculture: The Role of Infrastructure and Institutional Support. Journal of Rural Studies, 102, 45–57.

Lin, J. S. C., & Chang, H. C. (2011). The Role of Technology Readiness in Self-service Technology Acceptance. Managing Service Quality, 21(4), 424–444.

Muhardi, A., Pratama, R., & Sari, Y. (2022). Analisis Kesiapan Pengguna Sistem ERP Odoo pada PT Putra Jaya Santosa. Skripsi. Universitas Jember.

Nguyen, T. H., & Dao, H. T. (2022). Barriers to Digital Transformation in Smallholder Agriculture: Evidence from Vietnam. Technology in Society, 71, 102121.

Parasuraman, A. (2000). Technology Readiness Index (TRI): A Multiple-item Scale to Measure Readiness to Embrace New Technologies. Journal of Service Research, 2(4), 307–320.

Prawati, T., & Puspitasari, W. (2024). Analisis Penerimaan ERP Modul HR dengan Model UTAUT2. Syntax Literate: Jurnal Ilmiah Indonesia, 9(5), 2015–2029.

Putra, R. P., & Nurmandi, A. (2021). Determinants of Farmers' Adoption of Digital Platforms in Developing Countries. Information Development, 37(4), 568–582.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. MIS Quarterly, 36(1), 157–178.

Wahyuni, R., & Nugroho, A. (2022). Kesiapan Petani dalam Adopsi Teknologi Digital Pertanian di Indonesia. Jurnal Agrisocionomics, 6(2), 101–111.