Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

FACTOR INFLUENCING THE BEHAVIORAL INTENTION FOR SMART FARMING (DRONE) APPLICATION AMONG OIL PALM SMALLHOLDERS

Nur Izatul Nadhirah Madlaim [1]
Nur Badriyah Kamarul Zaman [2*]

[1] Faculty of Plantation and Agrotechnology, Universiti Technology MARA, Melaka Branch, Jasin Campus
Email: 2022217506@student.uitm.edu.my
[2] Faculty of Plantation and Agrotechnology, Universiti Technology MARA, Melaka Branch, Jasin Campus
Corresponding Author: Email: badriyah@uitm.edu.my

Article history

Received date	**:**	1-10-2025
Revised date	**:**	2-10-2025
Accepted date	**:**	1-11-2025
Published date	**:**	12-11-2025

To cite this document:
Madlaim, N. I. N., & Kamarul Zaman, N. B. (2025). Factor influencing the behavioral intention for smart farming (drone) application among oil palm smallholders. *Journal of Islamic, Social, Economics and Development (JISED),* 10 (78), 295 – 304.

Abstract*:* *Smart farming in plantations brings numerous benefits to agricultural practices especially among smallholders in oil palm plantation. By leveraging advanced technologies like drones farmers can enhance efficiency in operation and optimize crop production. The limited adoption of drones among smallholders in agriculture is mainly due to financial constraints and lack of knowledge and skills. The study aims to determine factors that impact the behavioral intention of adopting smart farming technology (drone) among oil palm smallholders in Johor, Malaysia. This study used the Unified Theory of Acceptance and Use of Technology (UTAUT) as the conceptual foundation in developing the conceptual framework. The quantitative research method had been employed, and data had been collected through a structured questionnaire that had been distributed to 256 oil palm smallholders in Johor using convenience sampling technique. The data had been analyzed using the Statistical Package for Social Science (SPSS) software, and descriptive analysis and multiple regression analysis had been conducted to determine the relationship between the independent variables (performance expectancy, effort expectancy, social influence, and facilitating conditions) and the dependent variable (behavioral intention to adopt smart farming technology). The findings of this study would provide insights into the current level of adoption and the factors influencing the acceptance of smart farming technology (drone) among oil palm smallholders in Johor. This study can also be used as reference material for policy maker, government, and industry.*

Keywords*:* *Smart farming technology, adoption intention, oil palm smallholders, drone*

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

Introduction

Oil palm (Elaeis guineensis) is one of the major commodities for Malaysia. Malaysia's gross domestic product (GDP) contribution from palm oil was predicted to reach 2.7 percent of its GDP in 2020 (IGI Global, n.d). After Indonesia, Malaysia is the world's second-largest producer and exporter of palm oil (Lee, 2021). Malaysia exported around 16.2 million metric tonnes of palm oil and palm-based products in 2020, valued at approximately 73.3 billion Malaysian ringgit (Hirschmann, 2022. The industry's growth has fueled Malaysia's economic development, with the capability to supply 34% of the world's palm oil production (Senawi, 2019). Malaysia's oil palm acreage reached 5.73 million acres in 2021, with Sabah and Sarawak accounting for 54.5% of the total. To maintain sustainability, Malaysia aims to limit the oil palm grown area to 6.5 million hectares (MPOB, 2022). Palm oil contributes substantially to Malaysia's GDP, reaching 2.7% in 2020. The country exported 16.2 million metric tonnes of palm oil and palm-based products in 2020, valued at 73.3 billion Malaysian ringgit, contributing around 36.9 billion Ringgit to Malaysia's total GDP (MPOB, 2021). Palm oil is essential to Malaysia's economy, accounting for a quarter of worldwide consumption and 60% of the international vegetable oil trade (Bausano et al., 2023). However, the rising supply and demand have led to labor shortages and challenges, exacerbated by factors like movement control orders affecting planted areas and palm management practices. The oil palm sector comprises large companies and smallholders, with smallholders' involvement increasing. As of December 2019, there were approximately 650 thousand smallholders in Malaysia, contributing significantly to palm oil production and economic growth. Nearly 27% of the country's total oil palm area is cultivated by over 440,000 smallholders, playing a vital role in reducing poverty and improving rural communities' well-being (MPOB, 2022).

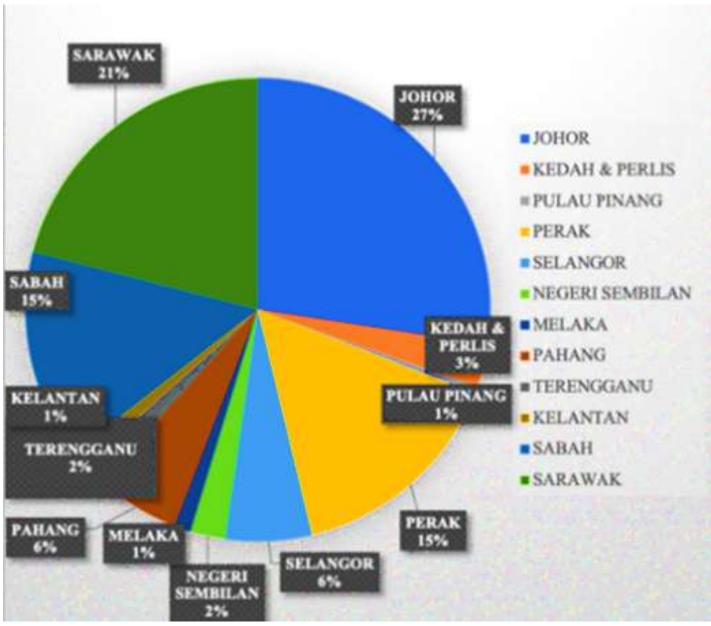

Figure 1: Number of oil palm smallholders in Malaysia

Source: MPOB, Dec 2022

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

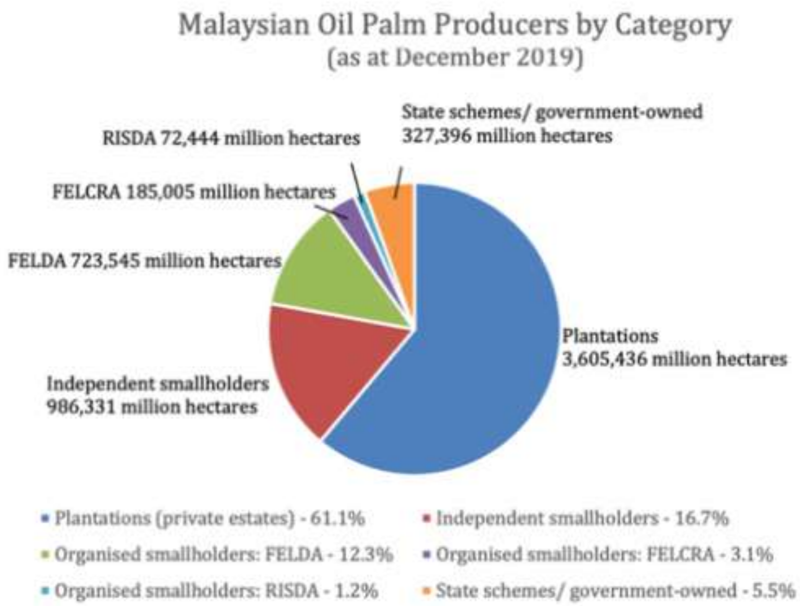

Figure 2: Malaysian Oil Palm Producers

Source: MPOB, 2024

Smallholders, individuals or households engaged in small-scale agricultural production, play a crucial role in global food production and rural livelihoods, particularly in developing regions (FAO, 2021). They face challenges due to limited access to resources, technology, and market opportunities. Smallholders engage in various farming activities, own small plots of land, and can be part of cooperatives or rural households. In Malaysia, smallholders are significant stakeholders in the palm oil industry, owning or managing oil palm areas less than 40.46 hectares in size (MPOB, n.d). The Malaysian Palm Oil Board (MPOB) plays a vital role in supporting and developing smallholders by providing advice, subsidies, funds, and introducing technology to improve work efficiency. MPOB's research and mechanization efforts have increased productivity significantly (MPOB, 2025). The oil palm industry in Malaysia can be categorized into plantations owned by large businesses, organized smallholders, independent smallholders, and government-owned schemes (MPOB, 2024). Oil Palm Independent smallholders in Malaysia contribute around 40% of the country's palm oil output and can access assistance through MPOB's TUNAS programme (Rahman, 2020). They have the flexibility to choose agricultural practices and technology and manage their land independently. The focus of this study is on independent smallholders due to their significant contribution to Malaysia's GDP and their flexibility and freedom in managing their land and agricultural practices.

Smart farming in oil palm plantations relies on remote sensing technology, primarily drones equipped with UAV technology, to optimize oil palm productivity while conserving resources (Akhtar et al., 2023). Drones provide a bird's eye view of the fields, enabling precise evaluations, monitoring individual palm trees, and conducting health assessments. They offer real-time data collection through sensors and automation systems, supporting intelligent decision-making and increasing productivity. Integrating drones and IoT in smart farming can improve connectivity and services in rural areas but also introduces cybersecurity concerns. In the palm oil industry, drones are used for tasks such as tree counting, health assessment, disease detection, and nutrient estimation. They play a role in addressing social and environmental issues, such as documenting encroachment and monitoring deforestation caused by oil palm expansion (Akhtar et al., 2023; Gohari et al., 2023; Kurihara et al., 2022). Overall, drone

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

technology offers opportunities for increased efficiency, cost savings, and sustainable practices in the palm oil industry.

Oil palm is of great importance to Malaysia, contributing significantly to the country's economy, GDP, foreign exchange earnings, and employment opportunities. The industry has experienced remarkable growth, making Malaysia the world's second-largest producer of palm oil. Smallholders also benefit from the oil palm sector, but it is essential to balance economic benefits with environmental sustainability and provide support and training to maximize positive impacts. Drones play a crucial role in oil palm cultivation, offering accurate tree detection, canopy cover assessment, disease monitoring, and environmental evaluation. However, smallholders use drones the least due to financial constraints and limited knowledge and skills. Smart farming in oil palm plantations faces constraints related to cost, technical knowledge, internet connectivity, data management, and resistance to change (Murphy et al., 2021). Overcoming these challenges requires collaborative efforts and government initiatives to foster broader adoption of smart farming for increased productivity and sustainable agriculture. To address the constraints and improve the adoption of smart farming in Malaysia's oil palm estate, this study aims to understand the factor influencing the behavioral intention for smart farming application focussing on drone among oil palm smallholder. Identifying these areas can lead to the development of new techniques and applications for better smart farming practices and increased food production in the face of environmental concerns. Embracing technology in oil palm production offers benefits such as climate change mitigation, increased efficiency, productivity, and sustainability.

Social influence is a crucial factor in technology adoption, as it encompasses the influence of peers, colleagues, and social networks on individuals' attitudes and behaviors towards technology adoption (Hao et al., 2018). In the context of smart farming, social influence can significantly impact smallholders' perceptions and intentions to adopt technologies such as drones (Zhang et al., 2024). Therefore, it is essential to explore how social influence factors interact with other variables, such as performance expectancy and facilitating conditions, to influence smallholders' behavioral intentions towards smart farming technologies. This study used the Unified Theory of Acceptance and Use of Technology (UTAUT) as the conceptual foundation in developing the conceptual framework. The UTAUT explains technology adoption through four main constructs which are Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions (Venkatesh et al., 2003). By integrating insights from the UTAUT framework, the introduction can provide a more nuanced understanding of the factors driving technology intention adoption among oil palm smallholders and set the stage for the subsequent analysis and discussion in the manuscript.

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

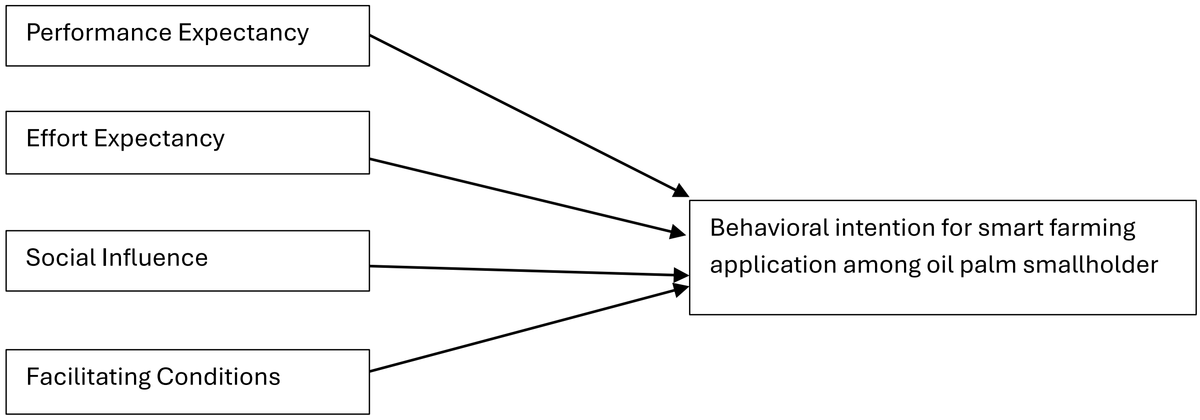

Figure 3: Conceptual Framework

Materials and Methods

Study Area and Sample Selection

Oil Palm smallholders in Johor were selected for the study. The smallest sample size was determined to be 164 people according to Daniel (1999), but an extra 60% (256) was added to get better results. This is because the larger the sample size, the more accurate the average values will be and larger studies provide stronger and more reliable results because they have smaller margins of error and lower standards of deviation (Charlesworth, 2022). The sampling method in this study is used convenience sampling. It is a method of collecting samples by taking samples that are conveniently as this study was conducted among oil palm smallholder and data collection was carried out while the farmers were at the farm.

Data Collection

Data collection is the process of getting information from all reputable sources to answer the paper's question, test the hypothesis, and judge the results (Dudovskiy, 2018). In this study data collection method is using questionnaire by physical and online surveys. Total population of oil palm smallholder in Johor is 58,584, thus according to the sample size calculation formula by Daniel (1999), the sample size would be 164. This study using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to assessed the behavioral intention for smart farming applications among oil palm smallholders. The questions were divided into seven sections which are for section A: Respondent's information, section B: Field information, section C: Performance expectancy, section D: Effort expectancy, section E: Social Influence, section F: Facilitating conditions, and section G: Behavioral intention. A total of 256 oil palm smallholders participated in the survey, and their responses were analyzed. The data had been analyzed using the Statistical Package for Social Science (SPSS) software. Descriptive and multiple regression analysis had been conducted to determine the relationship between the independent variables (performance expectancy, effort expectancy, social influence, and facilitating conditions) and the dependent variable (behavioral intention to adopt smart farming technology).

Pilot Study

A pilot study was conducted with 30 participants to assess the reliability of the questionnaire. Cronbach's alpha was 0.98, which indicated good internal consistency of the questionnaire.

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

Table 1. Reliability Statistics

Cronbach's Alpha	N of Item
0.989	22

Table 2. Cronbach's alpha

Variables	Cronbach's Alpha	No. of Item	Reliability Result
Performance expectancy	0.978	4	Excellent
Effort expectancy	0.971	4	Excellent
Social influence	0.961	6	Excellent
Facilitating conditions	0.928	4	Excellent
Behavioral intention	0.949	4	Excellent

Cronbach's alpha for the variable in the questionnaire used for this study ranged from 0.928 to 0.978. This meant that the instrument was accurate.

Data Analysis

Descriptive statistics were calculated for the independent and dependent variables. Multiple regression analysis was used to determine factors that influence the behavioral intention of adopting smart farming technology among oil palm smallholders. Data analysis was performed using Statistical Package for the Social Sciences (SPSS) version 22.0.

Results

Respondents Profile

Most of the smallholders are male (81%) and the rest is female (19%). Participant's age ranged from 20 to 80 years (Table 3). Most smallholders were in the age group 60 years and above. Majority of the smallholders are married (91%). 22% of the smallholders had a primary school/UPSR and 14% had an STPM/Diploma. Nevertheless, the greatest part (55%) had secondary school/SPM, and a small fraction (2%) were uneducational.

Table 3. Demographic features of Oil palm smallholders in Johor

	Variables	Frequency	Percentage %
Gender	Male	208	81
	Female	48	19
Age (years)	<40	38	15
	40-50	55	21
	51-60	71	28
	>60	92	36
Marital status	Single	11	4
	Married	233	91
	Divorced	12	5
Education	Undeducational	6	2
	Primary school / UPSR	56	22
	Secondary school / SPM	140	55
	STPM / Diploma	37	14
	Bachelor's degree / Master / PhD	17	7

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

More than half of the smallholders are involved as full-time oil palm grower (53%) (Table 4). Smallholders had variable experience in oil palm cultivation from 1 to 55 years. Most smallholders (41%) were in the category of 11-20 years of experience. There are ten areas in Johor and most of the respondents are from Kluang (31%) and Batu Pahat (27%). The fewest participants are from Johor Bahru and Tangkak which are 2%.

Table 4. Field information

Features	Frequency	Percentage %
Involvement in agriculture		
Full time	135	53
Part time	121	47
Year experience		
1-10 years	85	33
11-20 years	105	41
21-30 years	50	20
31-40 years	11	4
> 40 years	6	2
Plantation area		
Batu Pahat	69	27
Johor Bahru	6	2
Kluang	79	31
Kota tinggi	8	3
Kulai	16	6
Mersing	8	3
Muar	19	8
Pontian	31	12
Segamat	16	6
Tangkak	6	2

Result Behavioral Intention Score Level

Table 5. Score level

	Frequency	Percent
High	24	9.4
Medium	83	32.4
Low	149	58.2
Total	256	100.0

The findings from Table 5 reveal that in the oil palm sector, 9.4% of respondents exhibit a high intention to adopt smart farming applications, while 32.4% show a medium-level intention, and 58.2% demonstrate a low intention. These patterns stem from various challenges faced by smallholders, including limited knowledge, low income, and age factors. Smallholders often lack awareness and understanding of smart farming technologies like drones, while the perceived high costs associated with acquisition and maintenance, coupled with uncertainty about returns on investment, hinder adoption (Bashiru et al., 2024; Gumbi, 2023). Additionally, age influences perceptions, with younger smallholders viewing drones as valuable tools for

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

efficiency and precision farming, while older smallholders may hold more traditional views, impacting their willingness to adopt such technologies.

Factors influence behavioral intention

Table 6 showed the findings of multiple linear regression analysis. There are positive and substantial correlations between respondents' performance expectations, effort expectations, social influence, and enabling environmental variables. With a coefficient of 0.41, social influence had the greatest impact on respondents' behavioural intentions regarding smart farming among oil palm smallholders. Performance expectancy, facilitating conditions, and effort expectancy factors were next with coefficients of 0.189, 0.073, and 0.064, respectively. The primary factor impacting respondents' behavioural intentions about smart farming among smallholders of oil palm was the social influence factor. Wee and Lim (2022) claim that social influence variables mostly affected behavioural intention. In addition to performance expectancy, facilitating conditions, and effort expectancy factors, social influence is a significant factor in influencing behavioural intention (Faisal et al., 2020; Kopiyawattage et al., 2019; Kurniawan et al., 2021; Nassar et al., 2019; Schukat & Heise, 2021; Wee & Lim, 2022).

Table 6. Multiple linear regression

	Coefficients	SE	t-value	Probability	Tolerance	VIF
(Constant)	1.268	0.349	3.631			
Performance Expectancy	0.189	0.057	3.331	0.001**	0.191	5.235
Effort Expectancy	0.064	0.037	1.723	0.086**	0.342	2.926
Social Influence	0.41	0.051	7.996	0**	0.132	7.552
Facilitating Conditions	0.073	0.062	1.174	0.241	0.194	5.167
R Square	0.82			SE estimate	1.63313	
Adjusted R Square	0.817			Durbin-Watson	1.889	

Conclusion

The study focuses on understanding the behavioral intentions of oil palm smallholders in Johor towards adopting smart farming technologies, particularly drones. The findings reveal that a significant portion of smallholders exhibit a low intention to adopt such technologies, primarily due to financial constraints and limited knowledge. Factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions were found to influence behavioral intentions positively. Specifically, social influence emerged as the most impactful factor, followed by performance expectancy. These findings underscore the importance of addressing these factors to promote the adoption of smart farming technologies among smallholders. By leveraging positive social influences and emphasizing the perceived benefits of these technologies, stakeholders such as agricultural extension professionals, policymakers, and technology providers can play a crucial role in facilitating the adoption process and driving sustainable agricultural practices in the oil palm sector.

Reference

Akhtar, M. N., Ansari, E., Alhady, S. S. N., & Abu Bakar, E. (2023). Leveraging on advanced remote sensing- and artificial intelligence-based technologies to manage palm oil plantation for current global scenario: A review. *Agriculture, 13*(2), 504. https://doi.org/10.3390/agriculture13020504

Akhtar, M. N., Ansari, E., Alhady, S. S. N., & Abu Bakar, E. (2023). Leveraging on advanced remote sensing- and artificial intelligence-based technologies to manage palm oil plantation for current global scenario: A review. *Agriculture, 13*(2), 504. https://doi.org/10.3390/agriculture13020504

Bashiru, M., Ouedraogo, M., Ouedraogo, A., & Läderach, P. (2024). Smart farming technologies for sustainable agriculture: A review of the promotion and adoption strategies by smallholders in Sub-Saharan Africa. *Sustainability, 16*(11), Article 4817. https://doi.org/10.3390/su16114817

Bausano, G., Masiero, M., Migliavacca, M., Pettenella, D., & Rougieux, P. (2023). Food, biofuels or cosmetics? Land-use, deforestation and CO_2 emissions embodied in the palm oil consumption of four European countries: A biophysical accounting approach. *Agriculture & Food Economics, 11*(1), Article 35. https://doi.org/10.1186/s40100-023-00268-5

Charlesworth, Z. (2022). Understanding sample size and reliability in quantitative research. *Research Methods Quarterly, 14*(2), 45–58.*

Daniel, W. W. (1999). *Biostatistics: A foundation for analysis in the health sciences* (7th ed.). John Wiley & Sons.

Faisal, M., Kamarudin, S., & Hashim, H. (2020). Factors influencing farmers' behavioral intention toward agricultural technology adoption. *Journal of Agricultural Extension and Rural Development, 12*(4), 65–73.*

Food and Agriculture Organization of the United Nations. (2021, April 23). *Small family farmers produce a third of the world's food.* https://www.fao.org/newsroom/detail/Small-family-farmers-produce-a-third-of-the-world-s-food/en

Gohari, A., Ahmad, A., & Oloruntobi, O. O. (2023). Recent drone applications in Malaysia: An overview. *ISPRS Archives, XLVIII-4/W6-2022,* 131–2023. https://doi.org/10.5194/isprs-archives-XLVIII-4-W6-2022-131-2023

Gumbi, N. (2023). Towards sustainable digital agriculture for smallholder farmers: A systematic review of digital agriculture ecosystems. *Sustainability, 15*(16), Article 12530. https://doi.org/10.3390/su151612530

Hao, H., Padman, R., Sun, B., & Telang, R. (2018). Quantifying the impact of social influence on the information technology implementation process by physicians: A hierarchical Bayesian learning approach. *Information Systems Research, 29*(1), 25–41. https://doi.org/10.1287/isre.2017.0746

Hirschmann, R. (2022). *Palm oil export volume Malaysia 2013–2020.* Statista. https://www.statista.com/statistics/1119468/malaysia-palm-oil-export-volume/

IGI Global. (n.d.). *Malaysian oil palm industry: A view on the economic, social, and environmental dimensions.* In *Malaysian Oil Palm Industry.* IGI Global.

Kopiyawattage, K. P. P., Ranaweera, N. P., & Wickramasinghe, K. A. S. (2019). Factors affecting behavioral intention of adopting smart agriculture technologies among smallholder farmers. *International Journal of Agricultural Management, 8*(2), 75–86.*

Kurniawan, R., Lubis, D., & Susanti, R. (2021). Determinants of behavioral intention to adopt precision farming technology among smallholders. *Agricultural Economics Review, 22*(1), 47–59.*

Volume: 10 Issues: 78 Special Issue [November, 2025] pp. 295 – 304
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.academicinspired.com/jised
DOI: 10.55573/JISED.107825

Kurihara, J., Koo, V.-C., Guey, C. W., Lee, Y. P., & Abidin, H. (2022). Early detection of basal stem rot disease in oil palm tree using unmanned aerial vehicle-based hyperspectral imaging. *Remote Sensing, 14*(3), Article 799. https://doi.org/10.3390/rs14030799

Lee, P. O. (2021, June 3). *Sabah takes the lead in palm oil certification in Malaysia.* ISEAS – Yusof Ishak Institute.

Malaysian Palm Oil Board. (2021). *Overview of the Malaysian oil palm industry 2020.* https://bepi.mpob.gov.my/images/overview/Overview_of_Industry_2020.pdf

Malaysian Palm Oil Board. (2022). *Overview of the Malaysian oil palm industry 2021.* https://bepi.mpob.gov.my/images/overview/Overview2021.pdf

Malaysian Palm Oil Board. (2024). *The Malaysian oil palm industry performance – Mapping independent smallholders initiative.* Prestasi Sawit Malaysia. https://prestasisawit.mpob.gov.my/en/palmnews/news/37058

Malaysian Palm Oil Board. (2025). *Mechanisation & Engineering.* https://mpob.gov.my/2025/04/mechanisation-engineering/

Malaysian Palm Oil Board. (n.d.). *Extension Service Unit – Independent oil palm smallholders.* https://mpob.gov.my/ms/2025/08/extension-service-unit/

Murphy, D. J., Goggin, K., & Paterson, R. R. M. (2021). Oil palm in the 2020s and beyond: Challenges and solutions. *CABI Agriculture & Bioscience, 2*(1), Article 39.* https://doi.org/10.1186/s43170-021-00058-3

Rahman, S. (2020, December 17). *Malaysian independent oil palm smallholders and their struggle to survive* (ISEAS Perspective No. 144). ISEAS – Yusof Ishak Institute. https://www.iseas.edu.sg/wp-content/uploads/2020/12/ISEAS_Perspective_2020_144.pdf

Schukat, S., & Heise, H. (2021). Towards an understanding of the behavioral intentions and actual use of smart products among German farmers. *Sustainability, 13*(12), 6666.* https://doi.org/10.3390/su13126666

Senawi, R. (2019). Transformation of oil palm independent smallholders in Malaysia. *Journal of Oil Palm Research, 31*(3), 195–213.*

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425–478. https://doi.org/10.2307/30036540

Wee, G. W. E., & Lim, A. S. S. (2022). Factors influencing the behavioral intention for smart farming in Sarawak, Malaysia. *Journal of Agribusiness Marketing, 9*(1), 37–56.* https://doi.org/10.56527/jabm.9.1.4

Zhang, X., Yang, Q., Al Mamun, A., Masukujjaman, M., & Mehedi Masud, M. (2024). Acceptance of new agricultural technology among small rural farmers. *Humanities and Social Sciences Communications, 11,* Article 1641. https://doi.org/10.1057/s41599-024-04163-2