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Malaysian Good Agricultural Practices (MyGAP): Influential Factors for Adoption by Farmers in Negeri Sembilan, Malaysia

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Abstract: MyGAP, a certification programme for agriculture, aquaculture, and livestock, emphasises environmental, economic, and social aspects to ensure product safety and quality. This research focuses on understanding farmers' intentions and motivation levels regarding adopting MyGAP in Negeri Sembilan. Data from 367 farmers was gathered using a survey method through online and face-to-face interviews. The farmers were selected using simple random sampling from the population. The research employed various analytical methods: descriptive, Pearson correlation, and multiple regression. The findings reveal a significant and positive correlation ($p < 0.001$) between each variable and the adoption of MyGAP. Notably, perceived behavioural control ($\beta = 0.380$) emerged as the primary factor influencing MyGAP adoption. Implementing MyGAP is anticipated to enhance farm production, income, and marketability in the long term. It represents a move towards increasing the resilience of agricultural systems through sustainable practices, marking a significant stride in the sector's development.

Keywords: Intention, farmers, MyGAP, Theory of Planned Behaviour

Introduction

Agriculture holds a place of paramount importance in Malaysia, serving as a cornerstone for both the economy and food security. In a move to strengthen this sector, the Malaysian government laid the foundation for what would eventually be known as MyGAP in 2002. This initiative, a rebranding of the Malaysian Farm Certification Scheme for Good Agricultural Practices (SALM), the Livestock Farm Practices Scheme (SALT), and the Malaysian Aquaculture Farm Certification Scheme (SPLAM), was officially launched on August 28, 2013 by the Minister of Agriculture and Agri-based Industry (Ali et al., 2021). MyGAP, as Amekawa (2017) detailed, stands as a comprehensive certification system encompassing the agricultural, aquaculture, and livestock sectors, focusing on natural, economic, and social sustainability. Integral to the Economic Transformation Programme (ETP), under the Strategic Reform Initiatives – Competition, Standard, and Liberalisation (SRI-CSL), MyGAP aligns with the National Key Economic Area – Agriculture (NKEA – Agriculture), propelling the sector forward (Umar et al., 2014). The significance of MyGAP certification has grown over the years, becoming a benchmark for farmers who aim for high-quality production while upholding environmental and workforce standards. The path to acquiring this certification, which can span up to two years, is crucial for market accessibility, as Amri (2020) underscored, particularly with importers increasingly seeking MyGAP-certified products. This certification has also enhanced consumer confidence, as demonstrated in major supermarkets like AEON and Tesco, and has opened

new market avenues for farmers. Studies by Darnhofer et al. (2010) and Tiraieyari et al. (2013) further reinforce the viability of organic farming, in line with MyGAP principles, as a sustainable and nearly as productive alternative to conventional methods. This shift towards sustainable practices under MyGAP mirrors a global agricultural trend, emphasising the criticality of safety and quality from farm to market. However, the journey towards MyGAP adoption is not without challenges. Farmers must acquire new knowledge and skills, navigate potential increases in production costs, and adhere to the complex MyGAP standards. This study aims to delve into these challenges, identifying the key factors influencing the adoption of MyGAP. The insights gained aim to craft strategies and policies to foster broader acceptance and implementation of sustainable agricultural practices. This understanding is vital, especially considering the Malaysian government's dedication to sustainable development and agriculture's pivotal role in the nation's economic and social landscape.

Literature Review

The intention of the Adoption of MyGAP

Farmers' adoption of sustainable practices like MyGAP is shaped by socio-psychological factors, attitudes, normative pressures, and the influence of training and education (Terano et al., 2015; Zeweld et al., 2017; Nunes et al., 2021). Active participation in farmer groups and strong community leadership also play a crucial role in encouraging sustainable farming (Yang & Wang, 2022; Haris et al., 2022). Moreover, the involvement of farmer cooperatives in collective action is vital for overcoming challenges in adopting sustainable practices (Liang et al., 2023). Research into MyGAP's local implementation, like in Pahang's durian farms, shows its effectiveness in enhancing awareness and pesticide use, thereby improving food safety (Amekawa et al., 2017). Additionally, factors influencing sustainable agriculture adoption among paddy farmers in Kada, Malaysia, have been explored, offering insights into the broader application of these practices.

Knowledge and awareness

The foundation for adopting MyGAP lies in comprehending its principles and practices. Farmers who thoroughly understand MyGAP are more likely to appreciate its benefits, such as enhanced product quality, marketability, and sustainable farming methods. A study by Amrol et al. (2022) found a significant relationship between the knowledge of smallholders and the adoption of MyGAP, indicating that awareness and understanding of the certification scheme play a crucial role in its adoption. This suggests that a higher level of knowledge and awareness among smallholders is associated with a greater likelihood of adopting MyGAP practices. Additionally, Ali et al. (2021) identified inadequate knowledge as one of the challenges associated with implementing MyGAP among paddy farmers, highlighting the importance of knowledge in successfully adopting agricultural certification schemes. Sulaiman and Misnan (2022) indicate that well-informed farmers about MyGAP standards are more inclined to align their farming practices with these guidelines. Awareness campaigns, educational programmes, and training workshops are vital in disseminating information about MyGAP to farmers. Studies have shown that farmers who are more aware of the long-term benefits of MyGAP, such as improved market access, higher crop quality, and enhanced sustainability, are more likely to embrace these practices (Liu et al., 2018).

Attitude

People with a more environmentally conscious attitude are generally more inclined to adopt sustainable farming practices, as seen in those who are diligent about the sustainability of their farm activities, showing a higher likelihood of adopting sustainable agriculture certifications like MyGAP (Semuroh & Sumin, 2021). Terano et al. (2015) found that farmers who use and store chemical inputs properly are more inclined to employ sustainable farming techniques. Similarly, Serebrennikov et al. (2020) identified that the adoption of organic cultivation among farmers is influenced by their attitudes towards profitability and environmental concerns, noting a significant correlation between

their eco-friendly engagement willingness and their farming practices. Furthermore, Fam et al. (2019) observed that farmers with a positive attitude are about twice as likely to implement MyGAP.

Perceived behaviour control

Perceived behavioural control, as Serebrennikov et al. (2020) elucidate, is pivotal in understanding farmers' perceptions of the challenges and feasibility of adopting sustainable practices. This concept suggests that when farmers feel competent and prepared, they are more likely to embrace sustainable farming methods. Supporting this, Zeweld et al. (2017) observed a positive link between perceived control and the adoption of minimal tillage techniques. Atta Aidoo et al. (2022) further demonstrated that this perceived ease of implementing Climate-Smart Agriculture significantly influences farmers' intentions and actual adoption behaviours. Asente et al. (2023) also found that a heightened sense of control over pesticide usage positively affects the inclination to adopt safer practices. Waseem et al. (2020) underscore the crucial role of perceived behavioural control in farmers' decision-making processes, particularly regarding sustainable agricultural practices.

Training programmes and extension services

Adoption is substantially influenced by enhanced extension agent knowledge transfers and peer learning (Pham et al., 2021). The extension service is one crucial institutional component distinguishing farmers' adoption status (Melesse, 2018). Participation in extension programmes organised by governments, NGOs, and farmer-to-farmer interactions significantly impacts adoption in developed and developing countries (Priya & Singh, 2022). Training, experience, education, and extension services enhance the adoption of agricultural practice (Prodhan & Khan, 2018) by providing vital information and influencing farmers' perceived behavioural control and resource availability (Daxini et al., 2018). Furthermore, extension services are a vital source of information for farmers, especially regarding technology adoption (Abebe et al., 2018), and knowledge, attitude, perceived behavioural control, and subjective norms are significant factors in adopting MyGAP at the farm level (Amrol et al., 2022). Training has been shown to positively impact the adoption of certain practices (Tziraki et al., 2000).

Theory of Planned Behaviour

The study adopted the Theory of Planned Behaviour (TPB) due to its practical application to examine the social behaviour of farmers about sustainable agricultural techniques (Adebayo et al., 2012). According to Sharifuddin et al. (2018), Serebrennikov et al. (2020, Yanakittkul and Aungvaravong (2020), Sapbamrer and Thammachai (2021), Coulibaly et al. (2021), Nguyen et al. (2021), Damalas et al. (2022), and Amrol et al. (2022), attitude, subjective norms, and perceived behavioural control can influence farmers intention to adopt a new farming system. However, various other researchers have found that awareness and knowledge (Ochola et al., 2013; Terano et al., 2015; Issa & Hamm, 2017; Longkumer et al., 2023), training programmes and extension agents (Nunes et al., 2021; Kudama et al., 2021) are also influential variables.

Methodology

Conceptual Framework

Figure 1 shows that the conceptual framework is fundamentally grounded in the Theory of Planned Behaviour, the primary theoretical underpinning. This framework has been further refined and adapted based on insights and modifications identified in various studies extensively reviewed in the literature review section. These modifications are incorporated to tailor the framework to our study's unique context and specific objectives, ensuring a more robust and contextually relevant approach.

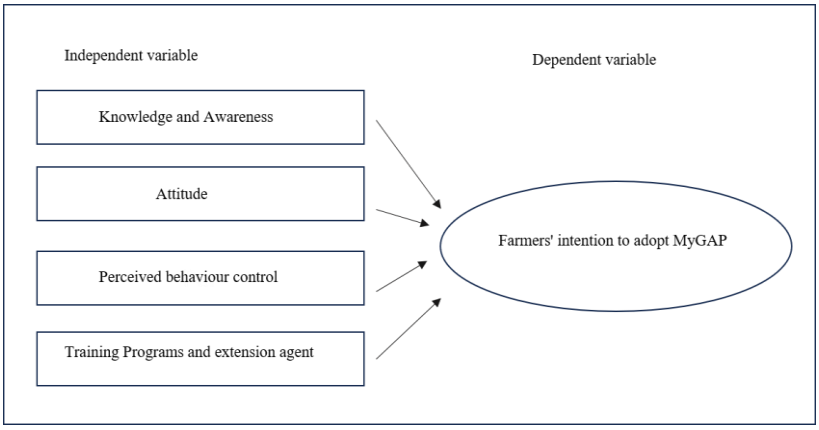

Fig.1 Conceptual framework of a farmer's intention to adopt MyGAP in Negeri Sembilan

Data Collection

This study, utilising a mix of online and face-to-face quantitative surveys, gathered data from farmers in Negeri Sembilan. Information on the farmer population was sourced from the 2022 online crop statistics booklet, available on the Department of Agriculture's portal under the Ministry of Agriculture and Food Security Malaysia (MAFS). The surveyed farmers comprised both adopters and non-adopters of MyGAP certification. A simple random sampling method was used to select 367 participants from a total regional population of 8,152 farmers. Data collection was carried out between May and July 2023. In assessing internal consistency, responses from 31 participants yielded a Cronbach's alpha of 0.933, demonstrating excellent reliability among the study variables.

Method of Analysis

Descriptive analysis summarised and illuminated the dataset's key features, providing insights into patterns and characteristics (Lamm, 2020). Correlation analysis assessed the strength and direction of associations between variables (Nazri et al., 2023). Additionally, multiple linear regression analyses identified factors influencing the intention to adopt MyGAP among farmers.

Findings and Discussion

Descriptive analysis was used to display the results of the farmer's socio-demographic profile. According to Table 1, most respondents were male (63.5%), with a significant number aged between 20 and 29 (38.1%). Most had secondary education (61.3%), and the prevalent income range was RM2000 to RM4000 (39.8%). Regarding farm size, the largest group (31.1%) managed farms over 2.0 acres. Additionally, 65.7% of respondents had received formal agricultural training, and 75.2% had accessed agricultural extension services.

Table 1. Descriptive analysis

Characteristics	**Frequency (N=367)**	**Percentage (%)**
Gender		
Male	233	63.5
Female	134	36.5
Age (years)		
< 20	12	3.3
20-29	140	38.1
30-39	136	37.1
40-49	70	19.1
50 above	9	2.5

Educational Level		
Primary	9	2.5
Secondary	225	61.3
Tertiary	133	36.2
Income (RM)		
< 2000	57	15.5
2000-4000	146	39.8
4001-6000	68	18.5
6001-8000	50	13.6
8001-10000	21	5.7
> 10001	25	6.8
Farm area (Acres)		
< 1.0 Acre	40	10.9
1.2-1.4 Acres	56	15.3
1.5-1.7 Acres	98	26.7
1.8-2.0 Acres	59	16.1
> 2.0 Acres	114	31.1
Formal Training		
Yes	241	65.7
No	126	34.3
Agricultural extension		
Yes	276	75.2
No	91	24.8

Table 2 reveals a significant correlation between various factors and farmers' intent to adopt MyGAP, with perceived behaviour control showing the strongest positive relationship. This control manifests as a blend of confidence in improved farm management, dependence on agricultural expertise, environmental awareness of resource use, and strategic planning for economic growth via exports. These findings resonate with Dong et al. (2022) and Gao et al. (2022), who also identified a positive link between perceived behaviour control and the intention to adopt MyGAP.

Table 2. Correlation Analysis

Elements	Correlation (r-value)	Significant (P-value)
Knowledge & awareness.	0.848**	0.000
Attitude.	0.636**	0.000
Perceived Behavior Control.	0.851**	0.000
Training Programs.	0.563**	0.000

**Correlation is significant at a 5% level

The results of the multiple regression analysis, as shown in Table 3, demonstrate an adjusted R^2 of 0.865. This high value suggests that 86.5% of the variance in farmers' adoption of MyGAP can be explained by the model used in the study. Each variable listed positively and significantly affects the intention to adopt MyGAP, with the perceived behavioural control exhibiting the most substantial effect. Aligning with these findings, Asente et al. (2023) reported a positive, significant impact of perceived behavioural control on farmers' intentions towards safe pesticide use. Similarly, this study's results show that attitude and perceived behavioural control are statistically significant at the 1% level, suggesting a higher likelihood of MyGAP adoption among farmers with positive attitudes and greater perceived control, a finding echoed by Tereno et al. (2015). Amrol et al. (2022) also highlighted the importance of knowledge and awareness in MyGAP adoption among pineapple smallholders, indicating a strong relationship between these factors and farmers' intentions, significant at the 1% level. Moreover, training programs and extension services have been identified as

significant predictors of the intention to adopt MyGAP. Supporting this, studies by Nunes et al. (2021) and Kudama et al. (2021) demonstrate that training initiatives, including workshops and on-farm demonstrations, positively influence farmers' intentions to adopt sustainable farming practices.

Table 3. Estimated coefficients of farmer's intention to adopt MyGAP

Parameters	**B**	**SE**	**t**	**Sig**
Constant	0.169	0.09	1.79	0.074
Knowledge and awareness	0.310	0.025	12.4	0.000***
Attitude	0.234	0.024	9.75	0.000***
Perceived behavioural control	0.380	0.027	14.08	0.000***
Training programs and extension service	0.031	0.021	1.48	0.015***
Adjusted R^2	0.865			

***1% Correlation is significant at a 1% level

Conclusion

In conclusion, farmers unanimously intend to embrace MyGAP's sustainable practices, driven by significant factors like knowledge and awareness, attitude, perceived behaviour control, and training and extension programmes. Their high motivation to adopt MyGAP is deeply rooted in a commitment to delivering superior products, improving the quality and health of their produce, enhancing their business reputation, complying with government policies, and fostering environmental sustainability. To encourage this trend, enhancing training services for practical knowledge, fostering collaboration between farmers, government, and experts, promoting MyGAP success stories, and continually updating MyGAP standards are recommended to ensure relevance and effectiveness in meeting both farmers' needs and sustainability objectives.

Suggestions for Future Research

Future research should examine the long-term effects of MyGAP adoption on farms' economic sustainability and the environmental health of farming communities. Specifically, it would be insightful to study the impact of MyGAP on the stability of farmers' incomes over time and to assess its influence on soil health, biodiversity, and the local ecosystems. Additionally, examining the challenges and barriers to MyGAP adoption among different types of farmers, such as smallholders versus large-scale operators, could provide insights into tailored support strategies. Research could also be extended to understand consumer perceptions and how MyGAP certification influences purchasing decisions. Finally, a comparative study between MyGAP and other global agricultural certification programmes could offer broader insights into the effectiveness of sustainable farming certifications worldwide based on the most crucial factors identified in this study.

Co-Author Contribution

The authors confirmed that there is no conflict of interest in this article. Author 2 was responsible for the preparation of the article and the supervision of the entire research process. Author 3 played a significant role in the academic research literature review and methodology sections. Author 1 was responsible for overseeing the data collection process and conducting data analysis. Author 4 and Author 5 collaboratively brainstormed the discussion section with the assistance of Author 2.

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