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Determinants of Permaculture Awareness among Vegetable Farmers in Perlis

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ABSTRACT

Permaculture has emerged as a sustainable agricultural approach that enhances ecological resilience, promotes resource efficiency, and supports long-term productivity, particularly within small-scale farming systems. However, despite its potential benefits, awareness and willingness to adopt permaculture practices among vegetable farmers remain relatively limited, especially among home growers in rural communities. In Perlis, vegetable farmers across five districts: Bintong, Mata Ayer, Paya, Padang Siding, and Beseri, were continuing to experience constraints such as limited exposure, financial concerns, and uneven understanding of sustainable agricultural innovations, which may hinder broader adoption. Therefore, this study aims to examine the factors influencing awareness of adopting permaculture practices among vegetable farmers in Perlis, focusing on two main variables, namely cost and knowledge (comprehension). A quantitative cross-sectional survey design was employed, involving 52 respondents selected from the Department of Agriculture (DOA) Perlis database. Data were analyzed using SPSS software, incorporating frequency analysis, reliability testing, Pearson correlation analysis, and multiple regression analysis to determine the relationships and predictive strength of the identified factors. The findings indicate that the research instruments achieved acceptable reliability levels. Inferential analysis shows that cost has a statistically significant relationship with awareness of permaculture adoption, with a p-value of 0.003 ($p < 0.05$), indicating a meaningful influence on farmers' awareness. Nevertheless, knowledge or comprehension is not statistically significant, with a p-value of 0.512 ($p > 0.05$), suggesting that it does not significantly contribute to awareness within the present model. Regression results further confirm that cost is the dominant predictor compared to knowledge. In conclusion, awareness of permaculture practices among small-scale vegetable farmers in Perlis is primarily shaped by financial considerations rather than knowledge-related factors. Therefore, targeted interventions such as subsidies, cost-sharing initiatives, and financial support mechanisms may be more effective in enhancing awareness and encouraging adoption of permaculture practices among home growers in the region.

Keywords: Awareness, cost, knowledge, permaculture, regression analysis

INTRODUCTION

Permaculture refers to the practice of designing landscapes with the intention of producing an abundance of food, fiber, and energy for the purpose of meeting the needs of the local community. These landscapes intentionally mirror the patterns and relationships that are identified in nature (Bhati et al., 2019). The definition of the word "permaculture" can vary greatly depending on where it was obtained, and it continues to mature as more time passes. The term "permaculture" was first coined by the movement's pioneers, who defined it as "an integrated, evolving system of perennial or self-perpetuating plant and animal species beneficial to humans" (Suh, 2014). Several nations, including Japan (Chakroun & Droz, 2020) and Malaysia, have conducted research on permaculture farms and their surrounding environments (Ismail & Affendi, 2015). Permaculture is distinguished by the presence of agroforestry systems, free-range grazing, swale systems, greywater collection systems, food forests (Ickowitz et al., 2022), and edible gardens (Russo & Cirella, 2019).

The widespread use of land by Conventional Agricultural Systems (CAS) is not sustainable since it accelerates soil organic matter depletion and fertility loss, threatening long-term food and nutritional security (Cárceles Rodríguez et al., 2022; Abbas & Shafique, 2019) Furthermore, CAS proliferation contributes to ecological imbalance and genetic biodiversity loss, which can destabilize ecosystems and increase the risk of emerging infectious diseases (Khan et al., 2024; Lori et al., 2023). The awareness began after realizing that most of the foods that we eat today have side effects due to a lot of chemical involvement and genetic modification. Permaculture is a way to produce food without the interference of any advanced chemical or genetic modification and is based only on the natural circulation of the environment, where organic natural produce that reaches the end of its lifetime becomes organic matter for the soil naturally. Even though it is a slow process, the results will produce agricultural products without any dangerous practices with the aid of natural fertilizer, natural nutrients, and natural mulches (Bouttes et al., 2019).

Government incentives and expansion of cultivated land have been shown to significantly increase crop production (Xing et al., 2025). Nonetheless, the widespread adoption of industrial farming practices has contributed to land degradation and reduced the ability of agricultural land to be sustainably reclaimed (Rodríguez et al., 2022). Moreover, extensive use of chemical fertilizers has long-term negative effects on soil quality, environmental health, and food security (Muche et al., 2022; Pandao et al., 2024)

In this era of advanced technology and globalization, humans are becoming more intelligent in developing and implementing technology in our food industry. A lot of inventions were made to meet the demand for food and fight food security and sustainability issues. As time went by, the community realized that the modern agricultural system has bad side effects on the environment and our health. The CAS involved the use of chemicals, opening up new areas, soil infertility, etc. The practice of permaculture offers many benefits, some of which include improvements to a person's health and social life, as well as improvements to the environment, food security, and resilience (D. Zhang et al., 2020).

Permaculture is a catch-all term for a wide range of practices and systems that improve the way soil and plants interact with each other. It makes good use of different ecological functions to improve ecosystem health and offer a wide range of ecosystem services (Didarali & Gambiza, 2019). The idea behind permaculture is not only for natural systems to work well, but also for activities to work together and improve human health and well-being. It is based on a few ethics and principles to encourage sustainable farming, which in turn encourages diverse and resilient agroecosystems (Fiebrig et al., 2020). People have been paying a lot of attention to the growth of the world's population and the rise of agricultural production for most of the last two decades. Both of these trends have the potential to threaten social, economic, and environmental sustainability.

In spite of this, there are only a few studies on permaculture that have been conducted in Malaysia, which has resulted in a knowledge gap regarding the design and structural characteristics of permaculture implementation (Ismail & Affendi, 2015). These characteristics demonstrate how the system can actually contribute to the food security of households. The purpose of this study was to examine permaculture in Malaysia. However, it is still at an infant level, with the community having minimal awareness, resulting in insignificant permaculture practices by the community, especially in urban areas (Siow et al., 2022).

In order to fill the knowledge gap, this observation was conducted to determine whether cost and knowledge influence the awareness of vegetable farmers in Perlis in adopting a permaculture strategy. It will be feasible to encourage farmers to adopt permaculture gardening by offering a clear interpretation, as well as a better grasp of the cost and comprehension, if this research is addressed. Therefore, methods of permaculture offer a wide variety of benefits, such as enhancing human health, making communities more resistant to the effects of environmental change, and reducing the amount of money spent on inputs (Rangra, 2023).

Five years from 2023, the Malaysian government predicted that the agrifood industry will expand and develop, such as the involvement of technology, increasing knowledge among farmers, and allocating funds for the agriculture sector. Government efforts to strengthen the agriculture industry can be observed through ongoing policy improvements under Malaysia's Agricultural Policy framework. As the global population continues to grow and advancements in the global food system are expected, it becomes increasingly important to understand permaculture practices and promote their adoption within agricultural systems. Therefore, this study focuses on farmers' knowledge and the cost-related factors that influence the adoption of permaculture principles in Perlis.

LITERATURE REVIEW

Permaculture

The term "permaculture" refers to a farming method that is designed to mimic the functioning of natural ecosystems. The practice of permaculture is both self-sustaining and capable of regenerating itself (Ferguson & Lovell, 2014). Although it was first created in a rural environment, permaculture is now a global grassroots movement that focuses on the environmentally responsible planning and construction of human settlements in both rural and urban settings (McLennon et al., 2021).

The meaning of the term "permaculture" shifts depending on the source and develops more with the passage of time. The progenitors of permaculture define it as "an integrated, dynamic system of perennial or self-perpetuating plant and animal species valuable to man" in the paper that served as the movement's founding document (Simmons, 1980). Later, David (2014) expanded his definition of permaculture to encompass broader issues of human settlement while still keeping the emphasis on agriculture: "Consciously designed landscapes that mimic the patterns and relationships found in nature, while yielding an abundance of food, fibre, and energy for the provision of local needs."

According to Ali et al. (2015), permaculture in Malaysia is still at an infant level, and the population has only a minimal awareness of the concept, which has led to minor permaculture activities being carried out by the community, particularly in metropolitan areas. People who lived in rural areas traditionally cultivated a wide variety of crops for their own personal use, primarily as a source of sustenance but also as a source of cash and medicine (Siow et al., 2022). This practice has been passed down from generation to generation. They make use of traditional agricultural practices that have been handed down from generation to generation. However, in the past 10 years, agricultural technology has advanced and become more modern with the assistance of motorized machinery, chemical fertilizers, and the most up-to-date pesticides.

The production of agricultural goods stands to gain in a variety of ways from the application of this technology (Suh, 2014). Nevertheless, the application of this modern technology has resulted in consequences that are unfavorable for both the standard of the goods that are manufactured and the state of the natural environment (Sgroi, 2022). They are able to collect agricultural produce throughout that season for a longer period of time, but they are unable to manufacture items that are of high quality, healthy, and safe to eat at the same time. In light of this, the use of a permaculture strategy within the context of a sustainable landscape is of the utmost importance in the agricultural sector of today (McLennon et al., 2021). It is feasible to keep agricultural fields and the environment around them in a sustainable state, and as a consequence, the agricultural products that are produced have a higher quality, are cleaner, are healthier, and are safer to consume.

Vegetables for Permaculture

Between the years 2019 and 2022, there was a rise in the agricultural area in terms of area harvested, with an increase of 1.38%. This indicates that the area of agriculture increases over time. Vegetables, with their high water and fertilizer efficiency, are more profitable to grow than other crops due to the high cost of urban land.

They are also advantageous in that they have a particular nutritional value, and they do not require any additional processing after they have been harvested. Because their life cycles are so short, vegetables can very quickly meet the needs of rising populations.

For instance, after a disaster, many vegetable species can be harvested just 60–90 days after sowing, and this time frame can be reduced even further when the plants are grown from seedlings (Dubbeling & Merzthal, 2010). As a result, urban horticulture is a system that can react reasonably quickly, which is especially useful after a breakdown in the food supply chains caused by trade isolation. (M. M. Khan et al., 2024).

It has been reported by Dubbeling and Merzthal (2010) and Orsini et al. (2013) that it is possible to achieve a yield of up to 50 kg per year on only 1 m^2 of land while growing fruit and vegetables. This is an exceptionally high yield when compared to other types of crops. People in the area have access to fresh veggies thanks to the farm, which also helps to make the neighborhood greener and more engaged.

In addition to this, community gardening helps to build neighborhoods and encourages individuals to engage in activities outside (Eigenbrod & Gruda, 2015). A review of 485 studies shows that the amount of land that is currently being used for global cereal production in developing countries is approximately ten times the amount of land that is being used by cities across the world, whereas the amount of land that is being used for global vegetable production is roughly equivalent to that which is occupied by cities. This leads to the assumption that vegetables are ideal for urban growing, both for high-tech equipment and for the self-supply of poor urban people, and that urban horticulture has the ability to achieve a certain degree of self-sufficiency (Sukmarani & Tsai, 2021).

Cost

The use of more empowered agricultural influence in urban and semi-urban developing areas became a leverage to increase the local economy, which in turn boosted the economy of the nation. There is potential for widespread adoption of permaculture practices in nations of varying income levels. The permaculture model achieves the ideal harmony between ecological, economic, and social considerations, which leads to even more environmentally responsible patterns of consumption on a global scale (Concepcion et al., 2021).

It is recommended that permaculture practices be integrated with commercial agriculture approaches in order to create more sustainable and resilient farming systems. Research by Sekhar et al. (2024) has demonstrated that combining traditional ecological practices with modern agricultural methods can improve environmental, economic, and social outcomes while enhancing biodiversity, soil health, and long-term farm resilience. The successful implementation of this approach also depends heavily on government support, public awareness, education, and participatory training programs that help farmers and communities better understand the value of permaculture and sustainable agriculture (Chimi et al., 2025; Prajapati et al., 2025).

Reduced energy consumption and increased recycling of materials are widely recognized as two major contributions of permaculture to sustainable agriculture. Permaculture systems are designed to minimize external inputs, recycle waste, conserve energy, and utilize renewable resources efficiently, thereby supporting ecological sustainability and resilience (BG, 2023; McLennon et al., 2021). Because permaculture reduces dependence on synthetic fertilizers and chemical pesticides, it is often considered a cost-effective farming system, particularly for small-scale and resource-limited farmers (Didarali & Gambiza, 2019). In addition, permaculture design methods encourage the strategic use of plants and ecological relationships to improve environmental quality, conserve resources, and support healthier living environments (Yadav et al., 2023).

Permaculture is fundamentally an organic farming approach that seeks to maximize the efficient use of available resources without relying on synthetic chemical inputs (Pr et al., 2024). One of the core principles of permaculture emphasizes the use and value of renewable resources to develop sustainable agricultural systems (Krebs & Bach, 2018). The use of biological fertilizers, such as green manure and compost, can improve soil fertility, enhance microbial activity, and increase agricultural productivity while remaining environmentally friendly (Pesaresi & Loit, 2024; Bhandari & Bista, 2019).

As a consequence of this, it unquestionably makes a contribution to a reliable and effective production cycle, in particular through the enhancement of soil fertility and levels of organic carbon, the mitigation of soil erosion, and the promotion of a greater variety of soil microorganisms (Hinton et al., 2021). Permaculture methods, in which only a small amount of man-made chemicals is used, are often relatively equivalent to organic methods and conventional methods, both of which demand significant financial investment. This information will prove to be very helpful to farmers who have a restricted number of resources.

Knowledge

One of permaculture's defining features is an emphasis on learning by doing. The emphasis shifts back and forth between knowing and being afraid. In an ideal world, there would be a set of minimum experiences that must be recognised intellectually. Once this is understood, there are a plethora of methods and experiments that may be performed to further one's comprehension. To practise permaculture, one must have both fear and understanding (Li, 2023). Food sovereignty, not food security, should be the focus of political action. That calls for a comprehensive understanding of the food system, which leads to the dramatic societal shift advocated by the Degrowth movement. In this regard, the permaculture approach can be a valuable resource (Q. F. Zhang, 2024; Rivera et al., 2024).

The traditional belief that nature was intended to be used sparingly is often linked to permaculture, making it all the more crucial that people acquire an awareness of these methods. Acceptance has grown for the concept that people need to live in harmony with the natural world rather than destroying it via exploitation. Permaculture is one farming system that can aid in maintaining cultural norms and values in the agricultural industry. Moreover, because permaculture practises allow farmers to rediscover "traditional" farming ways, they should be widely adopted. Nonetheless, most farmers have a hard time figuring out how to implement permaculture methods. In the same way that smallholder farmers in impoverished countries adopt permaculture because it allows them to integrate their knowledge of traditional farming practises with that of their own people, so may developed (Didarali & Gambiza, 2019).

Smallholder farmers, particularly in Malaysia, continue to face significant structural challenges such as limited institutional support, unstable markets, and inadequate access to agricultural knowledge and resources (Abiddin et al., 2023; Siti-Dina et al., 2023). Farmers' quality of life can be improved when they are provided with greater access to agricultural information, extension services, and market knowledge, as these resources contribute to empowerment and productivity (Magesa et al., 2020). Participatory agricultural programmes that include workshops, site inspections, technical assistance, and hands-on training have been indicated to help farmers adopt sustainable and agroecological farming practices more effectively (Gliessman, 2022). Through such training and knowledge-sharing initiatives, farmers become more confident and better equipped to experiment with permaculture methods on their own farms (Orton & Lee, 2025).

METHODOLOGY

The population in this study is the vegetable farmers in Perlis from 7 districts, namely Beseri, Bintong, Mata Ayer, Padang Siding, Paya, Chuping, and Titi Tinggi. There are a total of 141 farmers registered under the DOA Perlis as of the end of 2023. Five vegetable farm areas have been selected for this study, which are Beseri, Bintong, Mata Ayer, Padang Siding, and Paya, using cluster sampling. Thus, the sample of this study is 52 farmers chosen from the DOA of Perlis. According to Halim and Ishak (2014), it is noted that a sample size that falls somewhere between 30 and 500 would be suitable for most of the research. This sample size offers enough information to meet the study's goals, even though it may restrict the findings' applicability to a larger population. Furthermore, from a statistical standpoint, a sample size of $n = 52$ successfully exceeds the $n \geq 30$ threshold required by the Central Limit Theorem (CLT). This mathematical foundation ensures that the sampling distribution approaches normality, robustly validating the use of parametric statistical procedures,

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such as Pearson correlation and multiple linear regression, despite the finite nature of the localized population

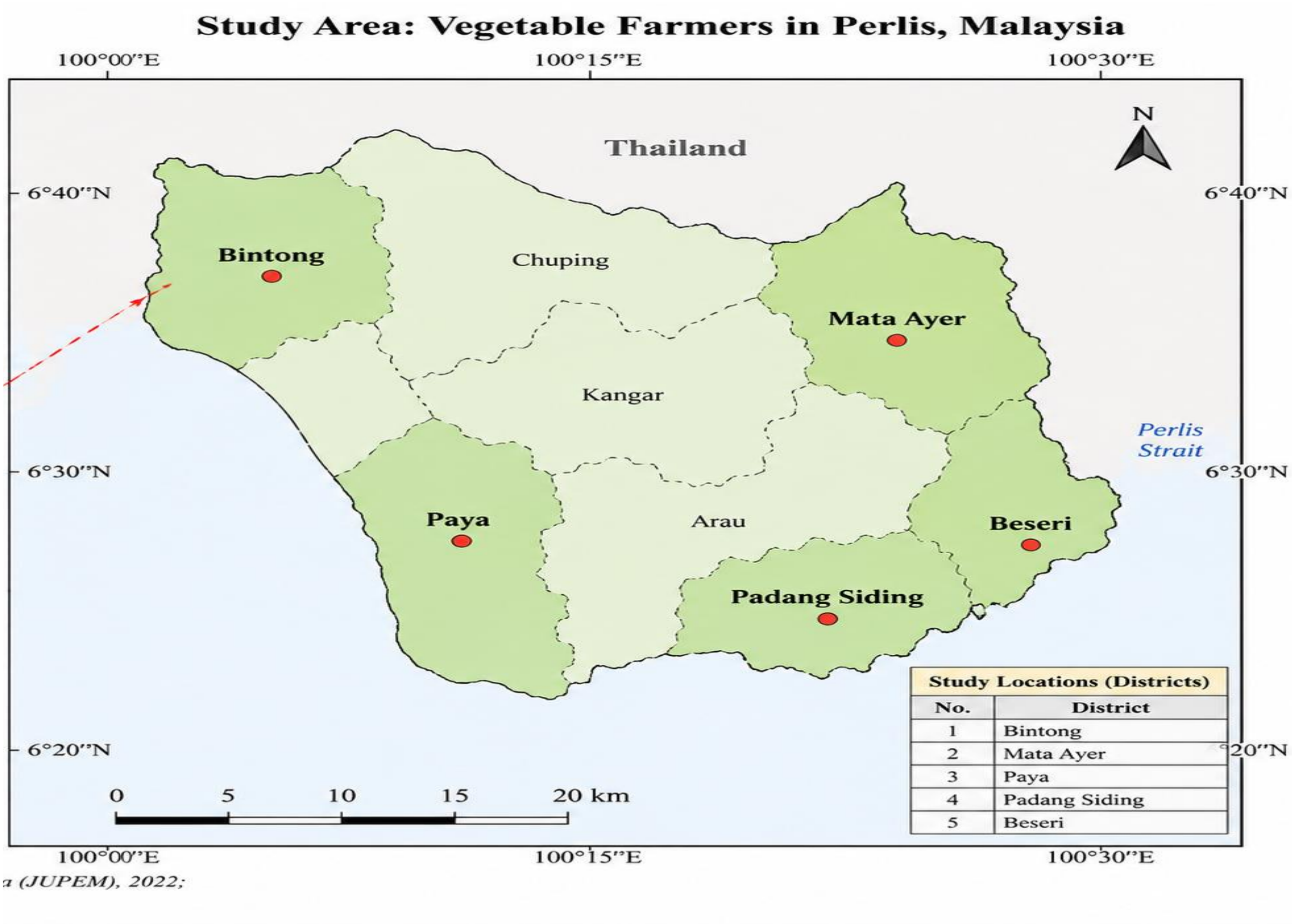

Figure 1: Map of Perlis

The data collection method used in this study is a direct questionnaire that was modified from Didarali and Gambiza (2019). The questionnaire consists of five sections as stated in Table 1 below. In the first section, the respondent was asked some questions on the demographic profile, such as gender, age, marital status, occupation, race, highest education level, living area, and monthly income. In the second section, the respondent was asked some questions regarding the knowledge of vegetable farmers towards permaculture practices. In the third section, the respondent was asked about the costs related to permaculture. In the last section, the respondent was asked about their awareness of permaculture practices. Using a 5-point Likert scale, the respondents were asked to score each statement according to its perceived relevance (1 = strongly disagree and 5 = strongly agree). Statistical Package for the Social Sciences (SPSS) software was used to conduct frequency analysis, reliability analysis, correlation analysis, and regression analysis.

Table 1: Instruments of Sections in the Questionnaire

Section	Title
A	Demographic
B	Awareness of Permaculture
C	Cost of Permaculture
D	Knowledge on Permaculture

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RESULTS AND DISCUSSIONS

Frequency Analysis

Table 2 explains and summarizes the demographic profile of the vegetable farmers in the five locations that had responded. A total of 52 respondents participated in the study, with the majority being male (96.2%), while female respondents accounted for only 3.8%. In terms of age, most respondents were aged between 51 and 60 years (59.6%), followed by those aged 41-50 years (23.1%), 31-40 years (13.5%), and a small proportion aged 20-30 years (3.8%). Most respondents were married (88.5%) and self-employed (42.3%) or retired (26.9%), indicating a sample largely composed of experienced individuals outside the formal employment sector. The respondents had mainly secondary-level education (69.2%), suggesting moderate educational attainment within a relatively homogenous group. It is reported that monthly incomes between RM1001-RM3000 (51.9%), reflecting a middle-lower income profile. Notably, the respondents demonstrated substantial experience, with the largest proportion reporting 15-25 years and more than 35 years of involvement (both 26.9%), reinforcing the maturity of the sample.

Table 2: Demographic Profile of the Respondents

Demographic	Frequency	Percentage
Gender		
Male	50	96.2
Female	2	3.8
Total	52	100.0
Age		
20-30	2	3.8
31-40	7	13.5
41-50	12	23.1
51-60	31	59.6
Total	52	100.0
Marital Status		
Single	6	11.5
Married	46	88.5
Total	52	100
Occupation		
Government	6	11.5
Private	10	19.2
Self employed	22	42.3
Retired	14	26.9
Total	52	100.0
Education level		
Secondary	36	69.2
IPTA or IPTS	15	28.8
Others	1	1.9
Total	52	100.0
Income		
< RM1000	3	5.8
RM1001 – RM3000	27	51.9
RM3001 – RM6000	21	40.4
RM 6001 – RM9000	1	1.9
Total	52	100
	Involvement	

Less than 5 years	1	1.9
5-15	11	21.2
15-25	14	26.9
25-35	12	23.1
More than 35 years	14	26.9
Total	52	100.0

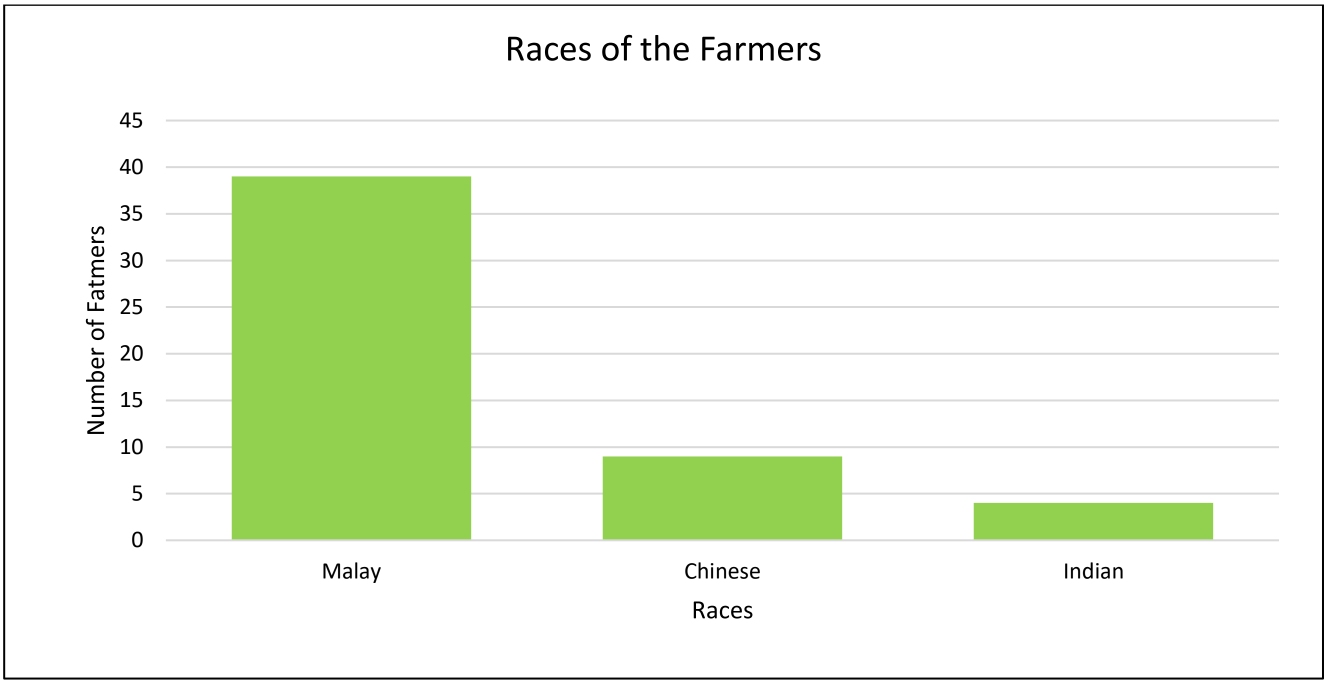

Figure 2: Races of Farmers

Figure 2 displays the absolute frequency of farmers across three primary ethnic groups (Malay, Chinese, and Indian), highlighting a heavily skewed demographic distribution. The Malay ethnic group constitutes the overwhelming majority, comprising approximately 39 of the farmers in the sample. In contrast, minority representation is notably limited, with the data indicating only 9 Chinese farmers and 4 Indian farmers.

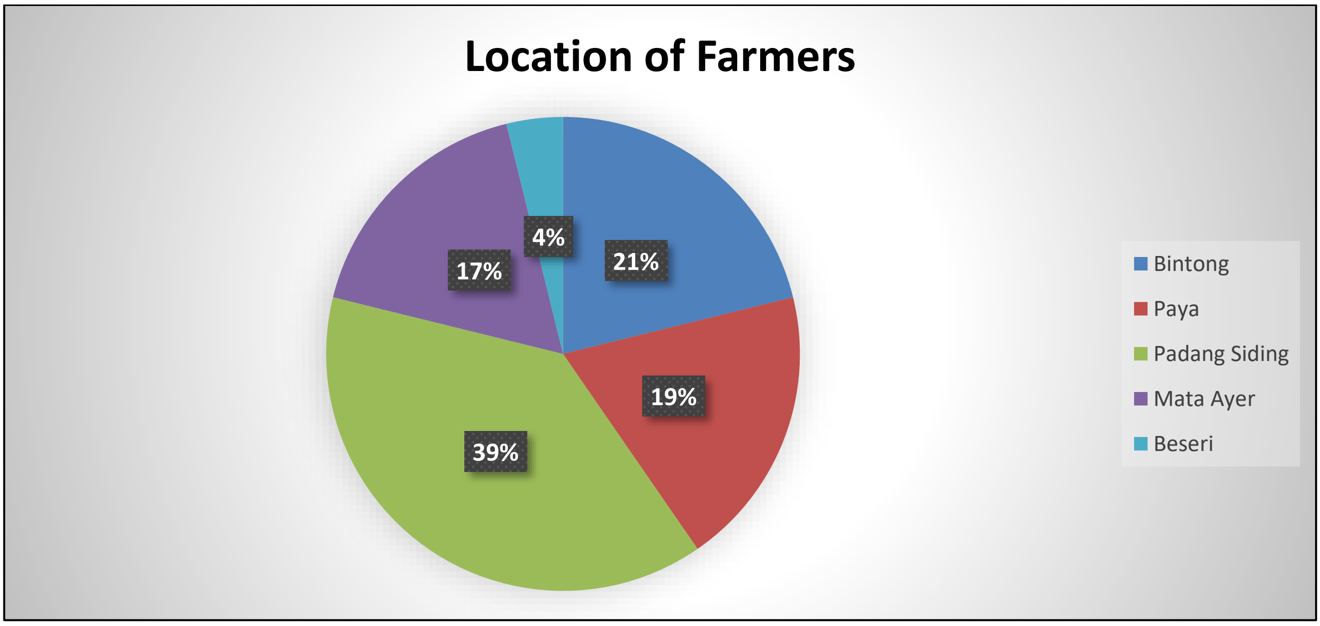

Figure 3: Location of Farmers

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Figure 3 presents the geographical distribution of vegetable farmers across the selected study locations in Perlis. The largest proportion of respondents was from Padang Siding, accounting for 39% (20 farmers) of the total sample. This was followed by Bintong with 21% (11 farmers), Paya with 19% (10 farmers), and Mata Ayer with 17% (9 farmers). The smallest representation came from Beseri, which contributed 4% (2 farmers) of the respondents. The concentration of respondents in Padang Siding suggests that vegetable farming activities are more prevalent in this area compared to the other locations included in the study. The unequal distribution of respondents across districts may reflect differences in agricultural land availability, farming intensity, or the number of registered vegetable farmers within each locality. The geographical factors may influence farmers' exposure to agricultural extension services, sustainable farming programmes, and awareness of permaculture practices. Therefore, location-specific strategies may be necessary when promoting permaculture adoption among vegetable farmers in Perlis.

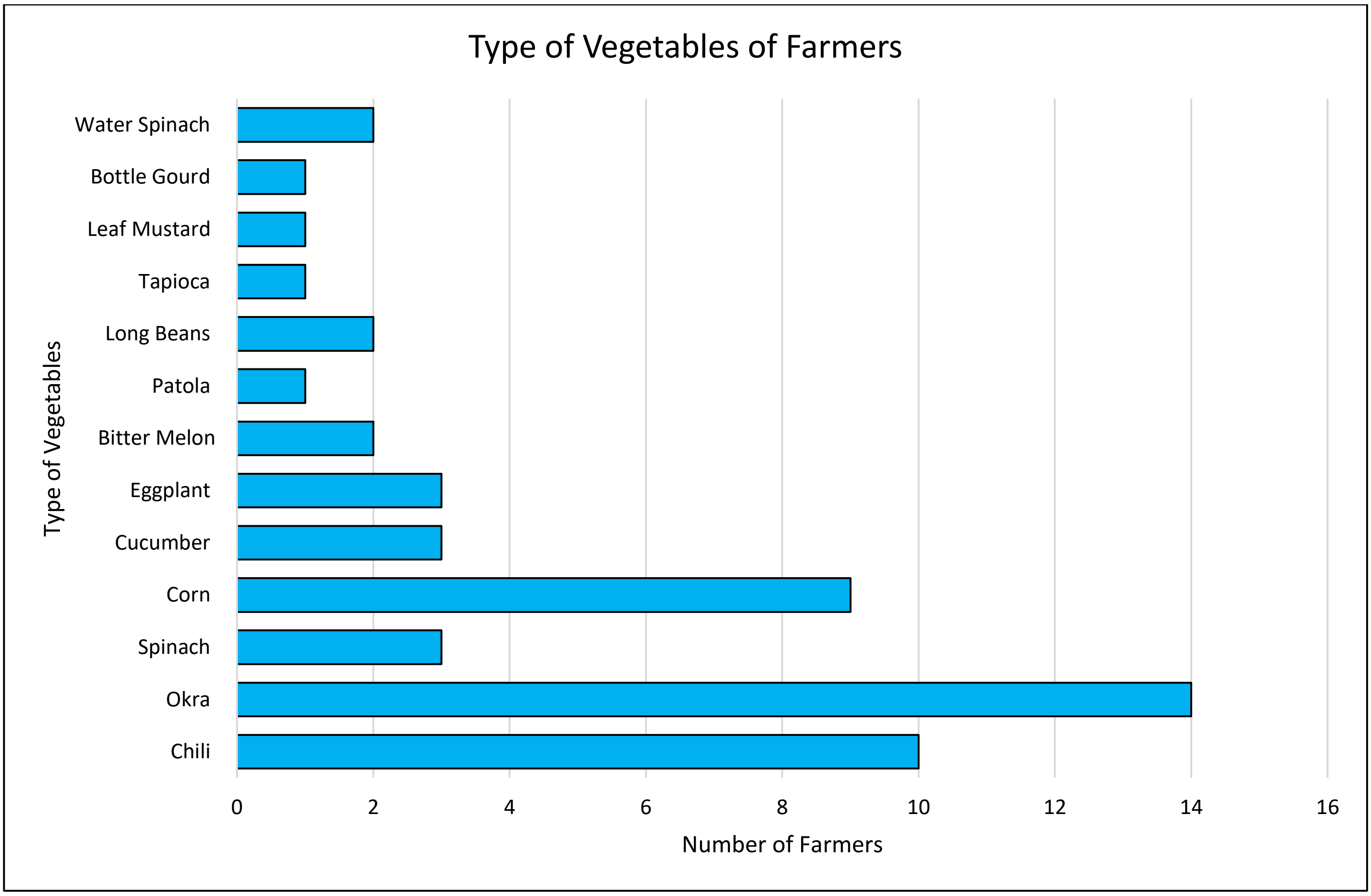

Figure 4: Type of Vegetables

Figure 4 illustrates the distribution of vegetable types cultivated by the 52 respondents involved in this study. The results indicate that okra was the most cultivated vegetable, with 14 farmers (26.9%), followed by chili, cultivated by 10 farmers (19.2%), and corn by 9 farmers (17.3%). These three crops accounted for most of the vegetable production among the respondents, suggesting a preference for crops that are well-suited to local climatic conditions and market demand. In contrast, vegetables such as spinach, cucumber, and eggplant were each cultivated by three farmers, while bitter melon, long beans, and water spinach were cultivated by two farmers each. The least cultivated vegetables were patola, tapioca, leaf mustard, and bottle gourd, with only one farmer cultivating each crop. These findings suggest that vegetable production among farmers in Perlis is concentrated on a limited number of crop types, particularly okra, chili, and corn. This concentration may be attributed to factors such as profitability, ease of cultivation, market accessibility, and farmers' familiarity with these crops. The dominance of a few vegetable varieties also reflects the production patterns of small-scale farmers, who often prioritize crops with stable demand and lower production risks.

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Reliability Analysis

The reliability assessment indicates that all constructs achieved high internal consistency. Based on Table 3, Cronbach's Alpha values above 0.80 are considered very good, while values exceeding 0.90 indicate excellent reliability. In this study, the alpha coefficient ranged from 0.877 to 0.894, placing all constructs within the "very good" category. Specifically, the Cronbach's Alpha values for awareness, knowledge, and cost were 0.892, 0.877, and 0.894, respectively, demonstrating consistently strong reliability, suggesting that the measurement items within each are highly correlated and capture the intended latent variables effectively. None of the constructs fell below the acceptable threshold of 0.70, indicating no issues related to scale inconsistency. Overall, these results confirm that the instrument used in this study is reliable for subsequent inferential analysis. The consistently high alpha values also reduce concerns regarding measurement errors, thereby strengthening the robustness of the findings.

Table 3: The Cronbach's Alpha Reliability Levels

Cronbach's Alpha	Internal Consistency
Less than 0.6	Poor
0.6-0.7	Moderate
0.7-0.8	Good
0.8-0.9	Very Good
0.9 and above	Excellent

Table 4: The Result of Reliability Analysis

Variable	No of item	Cronbach's Alpha	Internal Consistency
Awareness	5	.892	Very Good
Cost	3	.877	Very Good
Knowledge	5	.894	Very Good

Pearson's Correlation Analysis

The Pearson correlation analysis was done to find out how strong the relationship was between the independent and dependent variables. The correlation coefficient (r) runs from -1 to 1, with -1 indicating a perfect negative correlation, 0 indicating no correlation, and 1 indicating a perfect positive correlation. A positive correlation indicates that as one variable increases, so does the other, whereas a negative correlation indicates that as one variable increases, the other declines (Mondal & Mondal, 2017).

Table 5 presents the Pearson correlation coefficients between the independent variables and the dependent variable. The results indicate that cost exhibits a strong positive correlation (r= 0.630), while knowledge indicates a moderate positive correlation (r=0.536). These findings suggest that an increase in both cost-related considerations and knowledge is associated with higher levels of the outcome variable. Notably, cost demonstrates a relatively stronger association compared to knowledge, implying that financial factors may play a more influential role in shaping the outcome. However, both variables exceed the commonly accepted threshold for moderate correlation (r> 0.50), indicating meaningful relationships.

Table 5: Pearson's Correlation Analysis

Variables	Pearson Correlation
Cost	.630
Knowledge	.536

Regression Analysis

Table 6 presents the results of the regression analysis. The overall model is statistically significant (F=16.466), indicating that the independent variables jointly explain a meaningful proportion of variance in the dependent variable. At the individual level, cost emerges as a significant predictor (β=0.510, t=3.070, p=0.003), demonstrating a strong positive effect on the outcome variable. This suggests that cost plays a critical role in influencing the awareness to adopt permaculture among vegetable farmers. The finding that cost significantly influences awareness is consistent with Hinton et al. (2021), who reported that financial constraints remain the primary barrier to permaculture adoption among smallholder farmers in Malawi. In contrast, knowledge does not exhibit a significant effect (β=0.115, t=0.653, p=0.517). The insignificant effect of knowledge contrasts with recent empirical evidence showing that structured knowledge-transfer and agricultural extension interventions significantly improve farmers' adoption of improved agricultural practices (Fabregas et al., 2019).

Table 6: Regression Analysis

Independent variable	β	t	ρ-value
Cost	.510	3.070	.003
Knowledge	.115	.653	.517
F-value	16.466		

CONCLUSION

The study was conducted to study the relationship between costs and comprehension with awareness of adopting permaculture practices among vegetable farmers in Perlis. The objectives of the study were to determine the significant relationship between the costs and comprehension of awareness to adopt permaculture practices among vegetable farmers in Perlis.

The independent variables of the study were costs and knowledge. The dependent variable of the study was awareness of adopting permaculture practices among vegetable farmers. The focus of the study is the vegetable farmers in Perlis who registered under the DOA database. The probability cluster sampling technique was used to collect the data from the respondents in the study. There were 52 respondents altogether in this study, and the data were collected using a Google Form. In the study, a few analyses were used, such as the reliability test, the descriptive analysis, the regression analysis, and the correlation analysis.

The findings of this study reinforce the central role of cost as a key determinant influencing the outcome variable. The significant positive effect of cost is consistent with prior studies that emphasize financial considerations as a primary driver in decision-making, particularly in resource-constrained contexts (e.g., Joseph F. Hair Jr. et al., 2019; Uma Sekaran & Bougie, 2016). In agricultural and technology adoption settings, cost has frequently been identified as a critical barrier or motivator, shaping both access and willingness to adopt new practices. For future research, the independent variable could be varied to explore other factors that could influence the awareness of adopting permaculture practices among vegetable farmers. Expanding sample size and geographical coverage would also improve generalizability and provide a more comprehensive understanding of the factors influencing decision-making in similar contexts.

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