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THE FACTORS INFLUENCING AGROPRENEURS' INTENTION USING TPB: A STUDY OF FERTIGATION PROGRAMME IN SELANGOR, MALAYSIA

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ABSTRACT

Malaysia has been continuously fertigation system, which is applying fertiliser solutions with irrigation water, typically through a micro-sprinkler or a drip system. This system has helped numerous small and medium-scale agropreneurs (agriculture entrepreneur) develop constant business. At a larger scale, fertigation is a means to address food security issues. Many small and medium-scale agropreneurs apply fertigation techniques in their crop cultivation. What are the underlying factors that cause them to continue using these techniques in their cultivation practices? To what extent do their intentions in crop production using fertigation techniques measured? This study sought to investigate the factors that affect small and medium-scale agropreneurs' intention to continue practising fertigation techniques in their agricultural activities. Using the Theory of Planned Behavior (TPB), this study examined 319 small and medium-scale agropreneurs' intentions and the moderating effect of personality traits under Farmer's Organization Authority (FOA) agency. The results revealed that the interests of FOA participants were determined significantly by subjective norms and personality traits while attitude, perceived behavioral control did not affect their intention. Household income, number of household, age and education similarly provides significant effect of the agropreneurs' intention. The findings of this study lead to the success of the fertigation program conducted and can further maximise the application of this technique to the cultivation of diverse crops. Additionally, the framework used can be adapted in various agricultural subsectors such as crop production, animal production, fisheries and agribusiness .

Keywords: *Intention, personality traits, small and medium scale agropreneurs, agricultural entrepreneurship, attitude, Theory of Planned Behavior*

INTRODUCTION

Agriculture is an importantsector for economic growth in many countries. Indeed, its contribution is invaluable as a prominent source of revenue, not only for developing countries but also for underdeveloped nations. Similarly, Malaysia's agriculture is seen as a growth enigma that provides much-needed revenue, particularly for rural communities (Bahaman et al., 2010). With a contribution of almost twelve percent of the country's gross domestic product (GDP), the agricultural sector serves as a forum of opportunities for moulding Malaysians to become agropreneurs in domestic agricultural entrerprises (Dardak, 2015).

The concept of agropreneurship is rarely discussed in the research. The term agropreneurship originates from the integration of both dimensions of the agriculture sector and the involvement of entrepreneurship in agricultural products (Yusoff et al., 2015). The

Malaysian government has stimulated the rebirth of the agriculture sector by injecting a new image on agriculture and the agro-based sector (Selamat and Nasir, 2013). This rebirth continues to aspire the agriculture sector, especially from the suffering of declination in the economic development caused by the world's low market price for agriculture commodities back in mid-1980s (Aznam Shah and Yunus, 2020). By the previous impact of the country's policy, new generations are encouraged to maintain and sustain their interest in the agriculture sector. However, agropreneurship is continuously being promoted by the government through the setting up of more viable farming enterprises. The concept will also help increase the government's employment strategy by creating a self-sufficiency economy for the rural communities (Hasan, 2011).

Much research has focused on agropreneurs on a large scale production, but less light has been shone on the small and medium-scale agropreneurs (Che Nawi et al., 2022; Yoganandan et al., 2022). In agriculture, most attention has focused on factors affecting production, such as supply chain risk (Waqas et al., 2022), but less on the importance of practices to produce a better yield. An aspect of the agropreneurship field is its ability to create local and national jobs. Through creating employment opportunities in the sector, agropreneurs can improve their performance based on reducing poverty. Furthermore, agropreneurs can refine their creativity and innovation factors to meet the consumer's demand, which will help maintain their enterprise viability (Bairwa et al., 2014). At the national level, economic viability in the agriculture sector may advance experiences for empowerment (Osikabor et al., 2011).

Therefore, the agriculture sector can outdo other industries such as the manufacturing and services sector, by contributing more to the national income. Agriculture contributed 7.3 per cent (RM99.5 billion) to Malaysia's Gross Domestic Product (GDP) in 2018 (Department of Statistics Malaysia, 2019), indicating the sector's capacity to sustain and support local jobs. The the employed labour force in agriculture rose to 14,776 persons in 2018 compared to 2017 (DoSM, 2019). A substantial increase in the number of employed individuals indicates that agricultural activity, being an appealing and profitable venture, offers direct employment and income to large and vulnerable sections of society, such as the below 40 groups (B40) in Malaysia. The Farmer's Organization Authority (FOA) is one of the government bodies involved in providing agriculture entrepreneurial packages by introducing new ways and techniques to improve farming. Fertigation is a technique of distributing fertiliser in the form of a solution, which is given directly into the tree's roots through an irrigation system. This technique should be promoted as it can increase productivity with efficient and reduced consumption of water and nutrients with practically no pollution. Fertigation programs are therefore important since they are a new way to assist small and medium-scale agropreneurs, most of whom come from the B40 group. In the absence of farmer interest, the success of this fertigation program can be threatened. Consequently, not only will it affect the program, but it can also affect the food supply. Therefore, this study is driven by the need to ensure the survival (survivability) of the fertigation program, by determining the factors affecting the readiness of agropreneurs. Studies have shown that farmers' motivation is often influenced by factors related to food production. Nevertheless, studies exploring personal factors are lacking. Theory of Planned Behavior, a theory that was introduced by Ajzen (1991), has been shown to be able to identify one's intention factors. Therefore, with reference to TPB, this study aims to determine the factors of small and medium-scale agropreneurs to continue to practice fertigation programs. The findings of this study are further expected to provide an overview of the continuity of the fertigation program.

METHODOLOGY

This study is a quantitative approach using the questionnaire as the tool for collecting data. The respondents were the participants of the Farmer's Organization Authority (FOA) monthly fertigation programme. As a part of the programme, the participants get support from FOA in marketing their agricultural products. The participants in this particular centre have been chosen as it is one of the largest agricultural product collection centres in the country. Trained enumerators carried out personal interviews at the center for 6 months starting March 2019 until August 2019 in E-Satellite Farm Seminar Hall, Telok Mengkuang Selangor. Prior

to the survey, the questionnaire was reviewed and revised by experts for validity. Corrections were made to ensure validity and accordance to the university's ethical guidelines.

We employed a purposive sampling method based on specific characteristics. It entailed (a) farmers who owned agriculture businesses and (b) farmers who participated in the Chilli and Rockmelon Fertigation programs provided by FOA. Following Krejcie and Morgan (1970), the sample size was 242. Nevertheless, the number of respondents interviewed was 420 and 319 usable questionnaire data were obtained. A pilot test was undertaken with the purpose to check the reliability of the scale and any external factors that might affect the actual survey in terms of timing and participation patterns of respondents. Based on the pilot test survey, amendments were made to the questionnaires on the personality traits items and the variable intention to remain in the agriculture sector.

Microsoft Excel and Statistical Packages for Social Science (SPSS) 21.0 program were used in checking, cleaning, and analysing the data. A reliability test was done for all the items on each variable used in this research to test its reliability and internal consistency. Two types of analyses employed were descriptive analysis and multiple linear regression.

Model Specification

In order to explain the causal relationships between several independent variables with the dependent variable, multiple regression analysis is used. Thus, the regression model for this study is as:

$$X_{AI} = \beta_0 + \beta_1(\text{IV1}) + \beta_2(\text{IV2}) + \beta_3(\text{IV3}) + \beta_4(\text{IV4}) + \beta_5(\text{IV5})$$

Where,

X_{AI} = Agropreneur's Intention to remain in the Agriculture Sector
IV1 = Respondent's Attitude
IV2 = Subjective Norm
IV3 = Perceived Behavioral Control
IV4 = Personality Traits
IV5 = Social Demographics of respondents

The model was established to identify if the tested factors have significant impacts on the intention of agropreneurs to remain in the agriculture sector. The variables used in this research were measured by several indicators based on Sumaedi et al. (2016). However, they were adapted to this research using key factors such as agropreneur's intention, attitude, subjective norm, and perceived behavioural control. Other factors such as personality traits and social demographics of respondents were also measured.

Each variable has its own items that were adopted from previous pieces of literature. In line with other agricultural research (e.g. Issa and Hamm (2017), Pouta and Rekola (2001), Sri Budhi et al., (2017), Maxwell and Slater, (2003), Yadav and Pathak (2017), Rezaei et al., (2019), Daxini et al., (2019), Maleksaeidi and Keshavarz (2019)), the statements and wording were formulated to capture the respondent's implicit beliefs. The wording of the statements was based in particular on the statements used in the existing pieces of literature (e.g. Fish et al., (2019), Akhtar et al., (2018), Maleksaeidi and Keshavarz (2019)).

The items were based on the information collected during the development of survey. Overall, 28 items are used to measure the TPB constructs. Whereas, 17 items are used to measure two constructs: personality traits and the respondents' social demographic. Attitude consisted of seven items, including the perception of agropreneurs towards the agriculture policy, agriculture sector, income generation and food security. Subjective norm covered the agropreneur's self-efficacy towards their intention and current technology practices in the agriculture sector. Meanwhile, perceived behavioural control consisted of seven items that covered the normative beliefs of agropreneur, and their support towards the FOA programs. Nevertheless, the personality traits represented the agropreneur's self-confidence, hope of success, persuability, manageability and knowledgeability in agriculture. In effect, the personality traits variable described the theoretical construct system of psychological farmer's unique response to stimuli from the environment (Pambudy, 2018). Pambudy (2018) has suggested that agropreneurs must have factors deriving from themselves that are useful in developing entrepreneurial traits. Seven items are derived from this variable in response to the hypothetical construct that

is linked to the variable intention. The independent variables included the socio-demographical data of respondents. These items are all anchored on a 5-point Likert scale from strongly disagree (1) to strongly agree (5), which are regarded as short enough to allow respondents to distinguish meaningfully between categories (Hansson et al., 2012). These key factors were measured by using the formula of the mean value. The socio-demographic construct consisting of age, gender, level of education, agriculture experience, presence of workers, other activities besides agriculture and share of agriculture income were measured as dummy variables. Meanwhile, land size, household income, and the number of households were measured using a continuous variable.

RESULT AND DISCUSSION

The total responses collected were 319. The respondents were dominated by males forming 74.6%, aged 45 to 54 years old (30.1%) with most having attended secondary school (50.8%), with no experience in the agriculture sector (69.0%), having from 1.1 to 2.5 acres of land (41.4%) with no workers (63.3%), average household income of RM2001 to RM3000 (28.5%) with 5 to 6 number of household (46.1%). They also claimed to have done other activities besides agriculture (62.1%) with 0 to 25 per cent share of agriculture in their income (85.6%).

Construct Reliability

The Cronbach Alpha values should be greater than 0.7 for constructs to be deemed internally consistent (Wong, 2013). The Cronbach's Alpha value for the agropreneur's intention, attitude, subjective norm, perceived behavioral control, and personality traits are 0.907, 0.768, 0.828, 0.830 and 0.801 respectively. These values are greater than 0.7, indicating that these five constructs are internally consistent. Rezaei et al. (2019) reported that the Cronbach Alpha value of all constructs in their research were either close to or above 0.70 (ranges from 0.751 to 0.853). This result of the test suggested the adequate reliability of the scale. Therefore, the present reliability analysis results indicate that Cronbach's Alpha value for each factor has exceeded the recommended level. Thus, it can be concluded that the items are fit for this study.

Table 1 Construct Reliability

Construct	Cronbach's *α*	Number of items
Agropreneur's Intention	0.907	7
Attitude	0.768	7
Subjective Norm	0.828	7
Perceived Behavioural Control	0.830	7
Personality Traits	0.801	7

Multiple linear regression analysis

We have employed multiple linear regression methods to explain the causal relationship between several independent variables with the dependent variable. The analysis of variance (ANOVA) results in shows the significance of the model with F-ratio that tested if the general regression model matches the data accurately. It is clarified in the table that the statistically significant independent variables predict the dependent variable, $F(17,301) = 10.309$, $p < .0005$, $R2 = 0.368$, which indicates that the regression model suits the data well. Any variables added to the forecast are statistically relevant with $p < .05$. Thus, the finding explains that the model is acceptable in using the independent variables and dependent variables of this research.

The model includes the predictors contributing to the significant influence in predicting thedependent variable. All of the factors that are significant to the intention of agropreneurs to remain in the agriculture sector were socio-demographic factors such as household income, number of households, age, and education level (Table 2). Among all the socio-demographic factors, the age of 18 to 27 is the main contributor supporting agropreneur's intention to remain in the agricultural sector ($\beta = 0.333$, $p = 0.000$). Young agropreneurs has higher intention in this study. As compared to Zainalabidin's et al. (2011), the difference with the FOA agropreneurs in terms of age distribution. The majority of the respondents in their study were between 46 and 60 years old. Other than that, the study reported that almost half of the sample were below 45 years old. This study proves that the younger the agropreneur, the greater their intention to remain in the agriculture sector. This suggests that young agropreneurs are more interested in the farming and agriculture sector, which will boost entrepreneurship work culture among the FOA members.

Then, it is followed by the tertiary education level (β = –0.114, p = 0.048). Initially, the descriptive analysis resulted in 49.2% of respondents with tertiary education form. It can be assumed that by 18 to 29 years old, most of the agropreneurs would have the tertiary education by having their diploma or degree. Thus, the result highlighted the importance of education in starting up a business to sustain in the long run. Compared to the study back in 2011, FOA agropreneurs had seen the importance of agriculture sector in reviving the economic sector (Zainalabidin et al., 2011). Courses which include sustainable farming practices, management and care of their produces, and use of current technology have served their need as an informal agricultural education provided by FOA. Education is a most needed prospect to survive well, especially in agriculture. Other writers including Borges and Lansink (2015) examined how the socioeconomic characteristics affected the farmer's intentions. Age and education are the main variables that vary community of farmers with respect to socioeconomic factors; some authors have used the cluster analysis based on age and education of farmer community to determine the different rates of intention to adopt and innovate.

Meanwhile, two other attributes concerning subjective norm (β = 0.329, p = 0.001) are found significant to the agropreneur's intention to remain in the agricultural sector. Subjective norm as mentioned earlier in this study, covers the level of self-efficacy of agropreneurs towards their intention. The result proves that the respondents are highly motivated in participating the program done by FOA. The program would have provided participants with various skills relating to the agricultural processes, which may foster their dedication to work harder in the industry. Maleksaedi and Keshavarz (2019) have found similar findings on the subjective norm, which has substantial relationships with the farmer's intention to preserve biodiversity on their farm. Senger et al., (2017) also highlighted the secure and vital link with the subjective variable standard on farmers' intention to diversify agricultural production.

Variable personality traits (β = 0.242, p = 0.000) are significant to the dependent variable in this study. The respondents have shown self-confidence in risk-taking when dealing with agriculture business. The discovery of personality traits was confirmed by Halim and Hamid (2011) who recorded a similar relationship between

Table 2 Multiple regression analysis results

Model	β	Std. Error	t-value	Sig.
(Constant)	0.583	0.381	1.531	0.127
0-25%	-0.242	0.149	-1.625	0.105
26-50%	-0.064	0.098	-0.647	0.518
51-75%	0.211	0.140	1.504	0.134
48-57 Years Old	0.092	0.084	1.104	0.270
58-67 Years Old	0.069	0.073	0.943	0.347
>67 Years Old	-0.116	0.142	-0.817	0.415
Gender	0.018	0.060	0.305	0.760
Land size	0.035	0.031	1.144	0.254
Perceived Behavioral control	0.105	0.089	0.955	0.340
Attitude	0.105	0.089	1.183	0.238
Household Income	0.059	0.018	3.268	0.001*
No of Household	0.072	0.032	2.240	0.026*
Mean_Subjective_Norm	0.329	0.098	3.376	0.001*
Mean_Personality_Traits	0.242	0.055	4.422	0.000*
18-27 Years Old	0.333	0.076	4.382	0.000*
Tertiary Education	-0.114	0.058	-1.982	0.048*

Dependent Variable: Agropreneur's Intention to Remain in the Agriculture Sector, Note: significant at p<0.05*

personality trait and entrepreneurial engagement; this was initially supported by several literary works such as Hornaday et al., (1971), Jarrko et al., (2006), McClelland (1961) and Littunen (2000). It was also endorsed by Pambudy (2016) who confirmed that their personality characteristics were influenced by the entrepreneurial characters of sheep farmers in Garut. Given the various background of respondents in FOA, it is interesting to discover the common factors that help encouraged entrepreneurship skills and traits amongst themselves. These factors are essential in realising the vision of MOA and to empower the FOA agropreneurs with a new paradigm shift in following the vision of 'agriculture is business'.

CONCLUSION

This study explores various TPB constructs that affect agropreneurs with regards to their intention to remain in the agriculture sector. By addressing the empirical gap,identifying significant characteristics canurther enhance and develop entrepreneurial skills among small and medium-scale agropreneurs. Subjective norm, personality traits and social demographic factors are among five variables that proved significant in this study. Alvariables are positively related to the dependent variable.

The positive impact of subjective norm variables on the intention of small and medium-scale agropreneurssuggests that the local government could see that having agricultural programs as a medium for disseminating knowledge on practicing fertigation. For instance, small and medium scale agropreneurs can be driven to focus on variety of organic products that are currently high in demand. While observing that consumers are more reliant on a healthy lifestyle, local governments can prioritise campaigns on using latest technologies and innovations such as utilise more sustainable input in producing safer yield of crops. In helping the small and medium scale agropreneurs to produce organic products, government should inculcate on the importance of Environment Quality Act 1964 in handling agriculture wastes to abate pollution whilst creating a healthy environment as this study proves that agropreneurs are highly influenced by the support and opinions of others about their intention. Particularly towards small and medium scale agropreneurs who are in their prime age, the local government revamp strategie to increase their interest in participating in the agriculture sector by relating agriculture into their daily lives. Agropreneurs overlooking the potential in the agrofood sector, for instance, are seen to improve the competitiveness of the industry and will ensure that the sector will be sustainable in the long run. The findings also have highlighted the factors that could be considered such as focusing more on education and training on young agropreneurs which will contribute to creating an entrepreneurial commitment. FOA may refer to this study finding as a basis for preparing and developing effective measures to be included in policies, procedures and services for agricultural entrepreneurs in the farming and agrobusiness industries that focus more on the B40 communities. With the unstable situation of the agriculture sector, they may be sustained in the industry despite the challenges by the support from the government.

Meanwhile, to fulfil the academic gap, this study has been fruitful in addressing the need to understand the factors from the small-scale agropreneur's aspect. t can be understood from the results of this research that TPB construct and personality traits are essential in contributing to the intention of agropreneur to remain in the agriculture sector. In this study, personality traits proved to have beneficial effects on agropreneur's intentions. By having good personality traits, agropreneurs are able to practice entrepreneurship work culture. The result of the multiple regression test revealed that certain constructs such as socio-demographics are essential as the key factors in helping the agropreneur's intention to remain in the sector. In TPB research, socioeconomic characteristics are considered as background variables and it is important to highlight those variables that can indirectly influence intention and actions by influencing behavioural, normative and control beliefs. Agropreneurs need to be moulded mentally and physically into having the capability to achieve the amount of agriculture production that will be sufficient in food security. By doing this, FOA needs to intensify efforts to encourage them with training to focus not only in terms of having a high technology but also to change the mindset of agropreneurs into producing a vast amount of agriculture production with a good quality. The ability of agropreneurs to inculcate these dimensions of entrepreneurial work culture may take

much effort from the younger FOA agropreneurs. Furthermore, subjective norms and personality traits are the two key factors that postulate the initiative of the government toward creating a better entrepreneurial commitment among agropreneurs. Social pressure on agropreneurs can be a significant referent for encouraging agropreneurs even though they have a negative attitude to this behaviour. FOA should focus on several plans to sustain agropreneurs financially through tough and medieval times during an outbreak or a pandemic. To enable them to remain in agriculture, they need to have a consistent salary in order to feed their family. In ensuring their marketed products are sold, FOA needs to create practical and commercially oriented agricultural activities to market their products during these times.

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