

Factors Influencing Fertiliser Purchase Intention among the Oil Palm Independent Smallholders in Sabah, Malaysia

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Abstracts

The oil palm sector is the primary economic development in Sabah, which create career opportunities and improvement of the livelihood among the oil palm smallholders. Concurrently, the oil palm yield is profoundly influenced by several factors such as fertiliser, harvesting round, weed control and farm management. This study investigated the perception of 381 oil palm independent smallholders (OPISH) in Sabah towards purchase intention to buy fertiliser for their farms after a subsidy scheme was completed. This quantitative study adopted establishment measurement for investigating the relationship between brand, price, dealer and fertiliser purchase intention among the OPISH. The partial least squares (PLS 3.0) and structural equation modelling tool were applied to analyse the data in this study. Reliability analyses revealed that all studied variables, such as brand, price and dealers, demonstrated a loadings value more than 0.7. The findings of the study show that most of the OPISH (71.2%) possess secondary school education, 55.4% are full-time farmers, 61.2% applied fertiliser based on their knowledge and 37% of them following MPOB recommendation. Only 59.8% had attended the fertiliser training or courses conducted by MPOB. About 40% of OPISH hired workers to conduct the fertiliser application.

Brands and dealers show a positive relationship with the fertiliser purchase intention while no significant relationship is shown by price. Brand image is the most influential factor affecting the OPISH purchase intention with the coefficient values of 9.518. This study demonstrates that the agriculture agency and fertiliser manufacturers need to conduct extension program to improve the OPISH knowledge on fertiliser management. It is imperative for fertiliser manufactures to produce more quality products and provide better after-sales services, thus will increase the OPISH purchase intention. Future studies need to be conducted to determine other factors influencing the OPISH intention to buy fertiliser such as product loyalty, availability and packaging.

Key Words: Brand, price, dealer, fertiliser purchase intention, independent smallholders, oil palm

1. Introduction

The total area of oil palm planting square in Malaysia until December 2018 was 5.85 million hectares with the key players involving private estates and smallholders (Kushairi *et al.*, 2018). At present, almost 650,000 smallholders are involved in the oil palm industry. Smallholders are categorised into two groups, that is the organised smallholders and the oil palm independent smallholders (OPISH). The oil palm yield is influenced by several factors such as fertilisers, soil types, harvesting round, weed control and other farm management.

Fertiliser has played a primary role to draw higher yields and better growth of oil palm trees, hence contributing to the sustainability of oil palm industry in Malaysia. The fertiliser can be construed as any organic or inorganic materials of natural or synthetic origin added into the soil to supply elements that are essential for plant growth. Several previous studies had explained the role of fertiliser concerning gaining high yield. Rahmahwati (2016) found that fertiliser application has a notable and positive relationship with the oil palm yield among the oil palm smallholders in Sabah. However, poor managerial ability and limited access to fertiliser could be contributed to the lower production of FFB among the smallholders (Salmiyati *et al.*, 2014). It was estimated that fertiliser cost makes up between 50% and 60% of the total cost of oil palm production in Malaysia (Ramesh, 2013; Zaki and Izuddin, 2014). The considerably high cost of fertilisers can be considered as a burden to the OPISH and consequently reducing their FFB yield and income.

Malaysian government took this issue seriously and introduced a two-year fertiliser subsidy scheme for OPISH for new planting and replanting in 2014. Each hectare needs almost one-tonne fertiliser per year. This figure demonstrates that the market of fertiliser in Malaysia is vast, dynamic and with immense competition. However, after the scheme completed, the OPISH still needed to buy fertiliser at their own expense. Several factors that influence the oil palm independent smallholders in the process of purchasing fertiliser have been identified. The factors are price, quality, brand, advertisement, agronomic service and dealers (Lu *et al.*, 2011; Kole, 2013). The information on how the brand, price and dealer able to influence the buying intention in the agricultural sector, especially in the oil palm industry is still inadequate. Ergo, this calls for a need to understand the OPISH personality, behaviour and purchasing pattern and how these factors are part of the decision making process. The specific objectives of this study are:

- 1) To investigate the impact of brand image on the OPISH intention to purchase fertilisers.
- 2) To examine the influence of fertiliser dealers on the OPISH intention to purchase fertilisers.
- 3) To determine the effect of price on the OPISH intention to purchase fertilisers.

This study is necessary as the oil palm industry is a significant contributor to Malaysia's GDP and provides a considerable number of job opportunities for Malaysians. Likewise, the number of OPISH participated in the oil palm sector is massive, hence reflecting the significance of this research. On the theoretical perspectives, this study will be able to supplement the present knowledge on fertiliser purchase intention within the context of the oil palm industry. The findings provide a better understanding of the factors that significantly influence the OPISH purchasing decisions that would enable the fertiliser company to adjust and tailored their fertiliser marketing strategies to serve the needs of its target market better.

2. Literature Review

The theoretical framework of this research demonstrates the three independent variables. The variables are brand, price, and dealer. Meanwhile, the dependent variable for this study is the fertiliser purchasing intention among the OPISH.

2.1 Brand

Branding is the marketing strategies of creating a logo, name or pattern to distinguishes a good from the other goods (Tiwari, 2015). Bernd (2009) defined a brand as an asset to the manufacturer. Brand of agriculture goods consists of two factors, that is standardisation and quality (East *et al.*, 2008). Brand plays an integral part in the development of purchaser decision making. The brand will assist the oil palm independent smallholder to select the best fertiliser product depending on their need and satisfaction (Hansen and Christensen, 2003). The excellent brand image will give a good perception towards the OPISH (Lee *et al.*, 2010) and assist the dealers to reach more sales target (Mohanty and Kumar, 2017). Besides, some customers prefer to buy the more popular product, even at a higher price because it can save their time and search effort of the product (Erida and Rangkuti, 2017). Also, Chitra (2014) revealed that several customers might decide a specific brand to express their social status, personality or to achieve their goal or benefit. They believe a particular brand provides high added value for their farm. Ayuthaya (2015) postulated that brand and purchase intention are positively correlated. Chen (2011) accordingly demonstrated that a strong brand would greatly enhance consumers purchase intention toward the brand. Meanwhile, Ismoyo *et al.* (2017) found the presence of a causal relationship between brand image and customers' desires to continue acquiring products from the same sellers. To conclude, a favourable brand able to generate a positive influence on purchase intention among customers (Homburg *et al.*, 2009; Vertica *et al.*, 2010; Tiwari, 2015). Thus,

Hypothesis 1 (H1): Brand has a positive and significant relationship with purchase intention among the OPISH.

2.2 Price

The price of the products often influences whether consumers will purchase them at all (Peter and Donnelly, 2011). As such, the higher price may imply the product is of good quality or more prestigious while the lower price usually considered as low quality, an indication of a fake or low class (Lantos, 2011; Zhang *et al.*, 2012). The fertiliser is generally expensive, and it will be logical for the OPISH to consider the best price for the optimum value. Furthermore, when the price acts as a sign of the quality of the product, the supplier will make pricing strategy in the market. The difference between the prices of their favourite brands may influence their buying intention, but not their decision of the brand choice (Tiwari, 2015). The price promotion is defined as an incentive to encourage the consumer to make a buying reaction to the products in a short time (Kortler and Keller, 2012). Price promotion able to attract the consumer to buy the product, especially during the adverse economic environment (Erida and Rangkuti, 2017. Muturi (1989) reported that smallholder farmers' fertiliser usage is affected by the fertiliser credit, fertiliser price, and producer price. Equally, pricing strategies have considerable influences on individuals' product and store choices; along with the amount and timing of purchases (Njeru, 2017). Meanwhile, the results from Sameti and Khalili (2017) study found that creative in-store advertising and purchase intention are positively correlated. Also, extant literature posits advertising effectiveness does have a significant relationship with purchase behaviours (Sameti & Khalili, 2017). Nonetheless, the limited fund will drive customers to choose what to buy by considering the costs and benefit. In other words, the costumers' purchase behaviour is directed by the financial needs (Kole, 2013). Therefore,

Hypothesis 2 (H2): Price has a positive and significant relationship with purchase intention among the OPISH.

2.3 Dealers

Most of the OPISH belong to the older age group, with the average age is 55 years (Sheilyza, 2015). They possess a minimum education level and limited farming knowledge. This situation is convenient for the dealers who utilise this opportunity to approach the oil palm independent smallholders in many ways to promote as well as to influence them to buy their fertiliser products. Practically, the buying process is influenced by the individual who provides the product information or gives an agronomy advisory (Kole, 2013). This is supported by Mohanty and Kumar (2017), who mentioned that farmer purchasing activities are influenced by dealer service. Dealers must be innovative and creative in creating a new method to appeal to their potential buyers. The dealer can promote their goods and motivate the oil palm independent smallholders due to their advertisement on media or TV. Kashyap and Raut (2005) shown that the dealer could profoundly influence the customer to purchase their product. Moreover, Quester *et al.*, (2004) defined a product is not merely a "physical goods", but it included a package of service with the delivering of the physical goods. There is ample evidence in the

prior literature to suggest that communication is a significant method to strengthen the purchaser-dealer relationship. In a similar note, efficient communication management between dealers and OPISH is required to guarantee the completion of the purchase. Therefore, *Hypothesis 3 (H3): Dealer has a positive and significant relationship with purchase intention among the OPISH.*

2.4 Purchase Intention

Purchase intention has two components, namely intention and purchase. Intention means the individual has plans to do something in the future. Thereupon, purchase intention is defined as the possibility that the individual will plan or be eager to buy products (Rahman *et al.*, 2014). In their study, Fishben and Ajzen (1975) mentioned that purchase intention is buyer purposes when they consider a product. When the purchase intention is high, it will contribute to an increment in the individual purchasing probability (Wang and Chen, 2016). However, this factor has not been notably addressed in the marketing of the agricultural product in Malaysia. Most of the previously studied mainly focusing on examining customer satisfaction and loyalty in the different industries.

3. Methodology

This study applied the quantitative method. A set of questionnaires was used to obtain primary data. The number of respondents was 381 out of 400. A questionnaire was distributed to the OPISH while they sold their fruits at the collection centre. The respondents consist of the OPISH in Sabah. They were selected as the oil palm sector is the vital key to the economy of Sabah. The total number of them was 34,657 peoples.

The questionnaire contained five sections. Section A, B and C focus on the independent variables such as brand, price and dealer. Section A comprises four items, designed to measure brand image. The measurement scale was developed by Ayutthaya (2013). Examples of items used in brand measures include fertiliser brand is “unique and different from other”, “meets consumer expectation”, “reflects the high quality” and “valuable”. Section B has four items adopted and adapted from Njeru (2017). The four items represent elements of price. Examples of items used in this measures are “I will buy fertiliser products that have a price discount”, “My shopping pattern is influenced by the dealer offers”, “price motivation my choice” and “I choose fertiliser product based on the discounts it offers”. Section C measures the dealer and comprises six items. Sample items of the dealer are “dealer cares about my need”, “responds to my complaints”, “dealer are honest and fair”, “provide good information”, “conduct farm visits” and “dealer nearest to my farm” Section D was designed for the dependent variable which to identify an OPISH purchase intention on fertiliser. Total items for this construct are three. Items include: “I will definitely buy the same brand in the near future”, “I intend to buy the same brand” and “I will continue buying the same brand”. Section E contains demographic of the

OPISH such as gender, academic level, job status, an advisory from extension officer and knowledge of fertiliser management. A questionnaire using a five Likert Scale was used to gather data for each construct of the research model. All instruments were adapted and adopted from the previous literature to suit with this study.

This study applied the partial least squares (PLS 3.0) and structural equation modelling tool to investigate the factors influencing fertiliser purchase intention among OPISH. Several tools are used in the analysis, such as reliability, cross-loading, the average variance extracted and the hypothesis testing.

4. Data Analysis

Table 1 demonstrates the information on OPISH gender, academic level, job status, and knowledge on fertiliser management. The response rate for this study is 95 per cent. Out of 381 respondents, 83.2% were male, and 16.8% were female. Most of the OPISH (71.2%) were secondary school leavers, 14.7% had attended primary school, and 14.2% were graduated. 55.4% of the respondents do not have a permanent job, and the balance (171 OPISH) are working in the government sector (47%) and 53% in the private sectors. A total of 61.2 % OPISH applied their fertiliser program using their knowledge, 37% follow the MPOB recommendation and balance by the use of their friends. About 40% of them hired workers to do the job. Only 59.8% had attended MPOB fertiliser training or courses. Finally, almost 20% of OPISH had never received any advice from TUNAS officers.

Table 1: Demographic of OPISH

Variables	Categories	Frequency	Per cent (%)
Gender	Male	317	83.2
	Female	64	16.8
Academic level	Primary School	56	14.7
	Secondary School	271	71.2
	University	54	14.2
Have a permanent job	Yes	171	44.6
	No	210	55.4
Which sector (if yes)	Government	80	47.0
	Private	91	53.0
Fertiliser recommendation	Own	233	61.2
	MPOB	142	37.3
	Others	6	1.6
Fertiliser application	By Their Own	225	59.1
	Hire Workers	156	40.9
Involved in training organised by MPOB	Yes	228	59.8
	No	153	40.2
Received services from TUNAS since planted oil palm	Yes	307	80.6
	No	74	19.4

Table 2 shows the result of cross-loadings and respective loadings. Hair *et al.* (2017) recommended that a loading number above 0.5 is considered as significant. Specifically, any

loading number that are below than 0.5 are deemed to be not significant. The result shows that all the items measuring a particular variable loaded high on that variable and loaded lower on the other variable, thus confirming construct validity.

Table 2: Loadings Results

Construct	Item	Loadings
Supplier	A1	0.887
	A2	0.895
	A3	0.888
	A4	0.887
	A5	0.843
	A6	0.845
Price	B1	0.882
	B2	0.915
	B3	0.921
	B4	0.886
Brand	C1	0.867
	C2	0.884
	C3	0.897
	C4	0.839
Purchase Intention	D1	0.919
	D2	0.892
	D3	0.922

The convergent validity was applied next to define whether the multiple items degree to measure the same concepts is in conform (Ramayah *et al.*, 2011). In this study, to assess convergent validity, we applied the factor loading, reliability and the average variance extracted (Hair *et al.*, 2017).

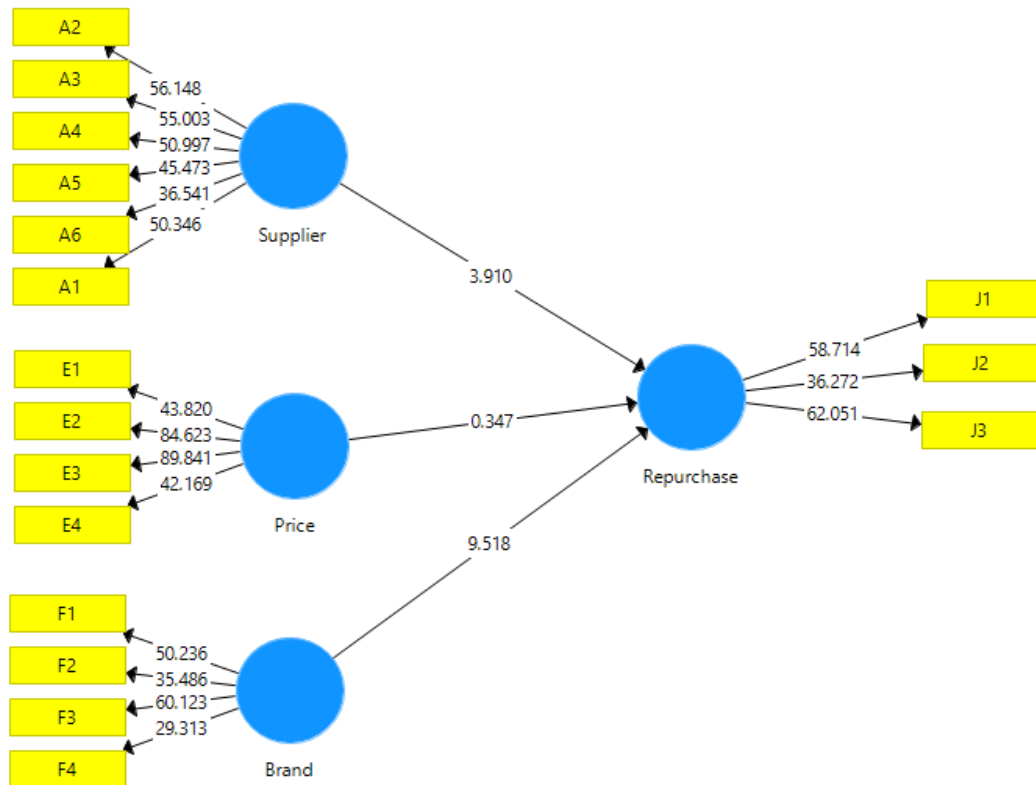
Table 3: Results of the Measurement Model

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Brand	0.895	0.927	0.761
Price	0.923	0.945	0.812
Purchase	0.897	0.936	0.83
Dealer	0.938	0.951	0.765

Table 3 demonstrates the results of the measurement model. All items loading value is higher than 0.5, as suggested by Hair *et al.*, (2017). Reliability values demonstrated higher than 0.7, as suggested by Hair *et al.*, (2017) was ranged from 0.895 to 0.938 is considered acceptable, and the measurement is reliable. The AVE results range of 0.761 and 0.83 are more than 0.5 are justified using that variable.

4.1 Hypothesis Testing

Figure 1: Measurement Model Result



Next, we continue with the path analysis to test the three-hypothesis. Figure 1 and Table 4 show the findings. The R^2 values were 0.528 demonstrated that 52.8% of the variance in the extent of the relationship could be explained by price, brand and dealer.

Table 4 illustrates that there is a positive and significant relationship between brand image and fertiliser purchase intention among the OPISH ($\beta= 9.518, p<0.001$). Therefore, hypothesis H1 is accepted. The results of this study suggest that a brand has a positive and significant relationship with the fertiliser purchase intention among the OPISH. The result implies that when the OPISH are satisfied with the brand and believe that the products would benefit their farm, there is a high possibility that they will pay for the product. This statement was supported by Thakor and Katsanis (1997), who mentioned that customer recognise a product through the brand image. They trust the brand through their experience before, and they feel the confidence that they can achieve their goal. This study shows that a brand is the most significant predictor, then followed by the dealer. It can understand that the better the brand image of the fertiliser product, the highest the purchase intention by the OPISH. The results of the brand preference are similar to the studies that have been conducted in different industries. A study in computer industry also shows a significant impact of brand on consumer purchase intention (Erida and Ranguti, 2017).

Hypothesis H3 assumed that there would be a positive and significant relationship between dealer and fertiliser purchase intention among OPISH. This study found that the dealers have a positive and significant relationship ($\beta=3.91$, $p<0.001$) with a fertiliser purchase intention, as shown in Table 4. The roles of the dealer that is disseminating information of fertiliser products, frequently communicating and giving advice could convince OPISH to purchase the product. This finding indicated that OPISH is willing to purchase the fertiliser when they trust the dealer. Redza et al. (2014) also reported a similar finding in his study on purchase intention of fertiliser in Malaysia that OPISH may have good experiences with the dealer in the past and dealer also located near to their farm. Dealer also has a good relationship with OPISH when the response to the complaints quickly and always conduct farm visits. It can be concluded that H3 is accepted.

Unlikely, hypothesis H2, the price factor ($\beta=0.347$, $p=0.729$) has been found as an insignificant predictor of OPISH towards fertiliser purchase intention, thus rejected the H2. This finding is contradicted with a study by Erida and Rangkuti (2017), who found that selling price was able to strengthen the influence of purchase intentions. The finding shows that the price discount is not enough to convince the OPISH purchase intention that has a great brand. It may be due to the perception that a high price is considered a better quality product and low price are considered low-class product. OPISH are reluctant to buy the sale product, as they assume that the product may be low quality or fake. The price cannot influence OPISH to the choice of fertiliser brand. One possible reason may due to the bad experience in the past when they buy discount fertiliser price, the nutrient content are also lower, and subsequently, the performance of their yield is not meet their expectation.

Table 4: Hypotheses Testing and Results

Hypothesis	Relationship	T Statistics	P Values	Supported
H1	Brand -> Purchase	9.518	0.000*	Yes
H2	Price -> Purchase	0.347	0.729	No
H3	Supplier -> Purchase	3.91	0.000*	Yes

* Significant at $p < 0.01$, ** Significant at $p < 0.05$

5. Conclusions

The fertiliser is an essential element that provides the nutrients for oil palm to ensure healthier growth and better yields. The operation cost for buying fertiliser is very high and almost 40% of the total production cost. Thus, OPISH is very particular when they are deciding to buy fertiliser for their farm. This study confirmed that the brand and dealer had influenced the OPISH in Sabah towards fertiliser purchase intention. Brand image is the most influential factor affecting the OPISH purchase intention with coefficient values of 9.518. Via the right

brand image, OPISH recognised that the fertiliser is the right quality product. This study also found that price discount does not encourage OPISH to purchase the unbranded product. The dealer must innovative in their marketing strategy through the brand image to increase OPISH buying intention.

The findings provided useful insight regarding factors that policymaker or dealer need to consider to enhance fertiliser used by OPISH in their oil palm farm. Knowledge of the market characteristics would provide the company with the ability to create financial objectives forecast that is reachable and on a par with other competitors. Besides, this study also can offer a valuable opportunity to fertiliser manufacturers to increase their sales to OPISH, at the same time increasing the FFB yield of OPISH. This study was only conducted in Sabah; therefore, the findings cannot be generalised for entire Malaysia. Similar studies need to be conducted in other states and to include other factors that can influence the OPISH to buy fertiliser such as product loyalty, availability and packaging.

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