Green Homes Need Green Homeowners: Investigating the Predictive Power of Environmental Concern through the Lens of Theory of Planned Behaviour

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Abstract: This study attempts to examine the intention of homebuyers to purchase green homes in Sabah. The extended Theory of Planned Behavior (TPB) served as a framework for identifying the drivers of green purchasing behavior and their relative importance. Specifically, the objective of this study is to examine the effect of attitude, subjective norms and perceived behavioural control on intention to purchase green house. In addition to that, environmental concern and perceived self-identity are incorporated into the model as the antecedents, influencing not only one's attitude towards a green home, but also directly towards intention to purchase green homes. Data were collected from potential homebuyers in Sabah, and analysed using Partial Least Squares Structural Equation Modelling. The findings suggested that all claimed hypotheses were supported except for social norms predictor. Implication and contribution of the study were discussed to justify the significance of this research.

Keywords- Environmental Concern, Green home, Intention, Partial Least Square Structural Equation Modelling, Theory of Planned Behaviour.

Date of Submission: 13-07-2018	Date of acceptance: 27-07-2018

I. Introduction

The concept of the buying process of green of sustainable products is relatively new to most Malaysians albeit its increase in academic research over the last few years. In fact, when referring to green related issues at the most basic level, such as energy efficiency, which includes natural ventilation and lighting capabilities, Malaysia is still considered to be at the infancy stage although the ideas had been introduced almost 47 years ago. The same case with housing developers, it may take a while before building homes using full-blown energy sustainability capabilities with recyclable materials, carbon neutral emission or water harvesting features will be materialized. In addition, for a house to be categorised as "green", the building materials that are used for construction purposes are compatible with the environment such as recyclable timber products, recyclable roof systems, recyclable kitchen cabinets, certified energy efficient appliances, compact fluorescent lamps and light-emitting diode lighting system [1]. Despite the potential of green homes in the housing market in advanced economy countries, very little is known about the behavioural intentions of house buyers in emerging markets such as Malaysia.

This study attempts to examine the intention of homebuyers to purchase green homes using extended theory of planned behaviour (TPB) to fortify the research's framework. The theory has received wide empirical support to explain the effect of attitude, subjective norms and perceived behavioural control on intention to purchase green house [2; 3; 4]. In addition to that, environmental concern and perceived self-identity are incorporated in the model as the antecedents influencing not only one's attitude towards a green home but also directly towards intention to purchase green homes. Previous studies proposed extending existing TPB to include self-identify would be appropriate for the prediction of behavioural intentions [5]. Therefore, this study was conducted to examine the purchase intentions of house buyers towards green homes by inclusion of self-identity construct as the extending of TPB which is still remain unclear in the literatures especially in the context of green home industry. This study eventually would help the industry such as in the property development, to determine the market demands by the consumers nowadays.

II. Literature Review

Considered as subjective assessments, intentions relate how people will do in the future and they propose a link between individuals and purchased products [2; 6]. Previous studies also offered insights how future behaviour measurement can be used to assess the intention [7; 8]. TPB was employed to underpin the framework due to its ability to capture the predictive power of purchasing intention on certain products as suggested by previous scholars [1; 9; 10; 11].

TPB illustrated attitudes as an important determinant of Individual's intention towards purchasing. Attitude manifests individual's specific behavior, whether to like or dislike certain outcomes [9; 12]. An individual may react positively on a certain thing if they perceived it to be good for them or react vice-versa [13]. Previous studies affirmed the idea of environmentally concern homebuyers do have positive attitudes towards intention to buy green homes compared to those who do not have those attitudes [1; 14; 15; 16; 17; 18]. Thus, the potential green homebuyer is perceived to have a positive attitude towards green concept of eco-friendly homes as green homes are purposely designed to reduce the construction impact towards the natural environment and human health by utilizing renewable resources, and consequently reducing degradation of the environment.

Social pressure influencing intention to purchase green homes, known as subjective norm, refers to surrounding pressure towards individual to behave according to the normative belief of other people [9; 12]. In some occasions, an individual may refer to their social referent such as spouse, family or peers to get their opinion on a certain thing such as intention to purchase products [12]. Their social influence will depend on who are the individuals preferred social referent, and their willingness to act according to these preferences [19]. Although study Tan [1] did not support the influence of social pressure towards the intention to purchase green homes, we still believe in most cases, social referent may still have influence especially for the first time green home buyers particularly in this study.

Perceived behavioural control is another important predictor of behavioural intentions in TPB. The ease or difficulty to perform a given behaviour largely depends on the individual's perception in perceived behavioural control. The presence or absence of important resources or opportunities do not deter someone to perform certain behaviours as perceived behavioural control is dependent on control beliefs [9; 12]. The product price and availability in a particular situation, determine the perceived control behaviour of buyers to perform certain behaviours [12]. Price and availability of green products sometimes become a limitation or hindrance towards individual considered purchases. Past studies indicated price as an important determinant of green purchases for most individual [20; 21]. Previous studies proved how the price of organic produce seems to be a main obstacle to the purchasing intention [20; 22; 23]. [22] and [24] studies also highlighted the availability issues as an obstacle to the intention to purchase green products. Therefore, our study suggested perceived behavioural controls, such as price and availability, influence the behavioural purchasing intentions towards green homes.

Past studies revealed TPB is unable to fully explain individuals' behavioural intentions. Hence, in order to understand differences in attitudes better, the inclusion of perceived self-identity will be considered to predict purchasing intentions [5; 25; 26; 27]. Individual's self-identity on carrying out a given behaviour of particular aspects refers to the perceived self-identity [28; 29]. What products individuals decide to buy reflect their self-identity, especially when that chosen product manage to fulfil their needs. Eventually, the choice of that product will mirror their self-image [30; 31]. Tan [1] affirmed that self-identity is a significant predictor of intention to purchase green homes. Thus, we have sensible reasons to believe that environmentally concern homebuyers are more likely to have the intention to purchase green homes.

III. METHODOLOGY

The samples for this study were potential homebuyers in Sabah, Malaysia. To ensure that the sample characteristics corresponded to the nature of the study, a non-probability quota sampling technique was adopted to ensure the collected data were indeed from valid sources. Sample size estimation is determined using G*power 3.0 analysis [32]. By using G-Power Analysis software, with the effect size of f square 0.15, α error pro 0.05, power Gf 0.8 with a number of 4 tested predictor, therefore 85 respondents are the minimum sampling for this study. 300 questionnaires were distributed; and 136 completed and usable copies were collected. Figure 1 depicted the research framework that contained statements of four variables investigated. The variables are assessed using multiple items [33], and the data was then analyzed using SmartPLS 3.0 [34] to examine the hypotheses.

Framework and Hypothesis Development

The literature hypothesized earlier claimed that attitudes, social norms, perceived behavioural control, and perceived self-identity towards green homes have a direct effect on the purchase intention among homebuyers in Sabah. The research framework of the study is described in Figure 1.



Figure 1. Framework

Thus, four hypotheses were formulated to direct the research problems and aims of the survey.

H1: Attitude towards green homes positively influence intention to purchase green homes.

H2: Social norms positively influence intention to purchase green homes.

H3: Perceived behavioural control positively influence intention to purchase green homes.

H4: Perceived self-identity positively influence intention to purchase green homes.

IV. Results and Discussion

Sample

The respondents (N=136) were among potential homebuyers in Sabah. The male respondents made up 52.2 percent and 47.8 percent were female respondents. More than half of the respondents (50.7 percent) were those between 20-30 years old. Native Sabahan, Malay, and other made up 43.4 percent, 30.9 percent, and 25.7 percent respectively. Majority of the respondents who participate in this study were those who possessed a bachelor degree (57.4 percent), followed by those who finished their secondary school (22.8 percent), diploma holders (18.4 percent), and the rest (1.5 percent) were master degree holders. More than 54 percent hold executive position in various organizations, and majority (64 percent) earn more than RM3000 per month. The profile of respondents was summarized in a report shown in Table 1.

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Variable	Items	Frequency	Percentage						
variabic	itens	(n = 136)	(%)						
Gender	Male	71	52.2						
Gender	Female	65	47.8						
	20-30	69	50.7						
A = -	31-40	45	33.1						
Age	41-50	12	8.8						
	> 50	10	7.4						
	Malay	42	30.9						
Ethnicity	Sabah Natives	59	43.4						
	Other	35	25.7						
Deligion	Muslim	83	61.0						
Religion	Non-Muslim	53	39.0						
	Secondary Level	31	22.8						
Education	Diploma	25	18.4						
Education	Bachelor Degree	78	57.4						
	> Master	2	1.5						
	Executive	74	54.4						
	Non-Executive	38	27.9						
Job	Self-Employed	9	6.6						
	Unemployed	2	1.5						
	Other	13	9.6						
	< RM1500	16	11.8						
C - 1	RM1500-RM3000	32	23.5						
Salary	RM3001-RM5000	46	33.8						
	> RM 5000	42	30.9						

Table 1. Respondents' Profile

Measurement Model Assessment

Table 2 demonstrated the findings of construct reliability (CR) and convergent validity testing. The results validated that the constructs (or variables under investigation) had high internal consistency [35], and sufficient average variance extracted (AVE) to approve the convergent validity [36].

Constructs	Items	Loadings	Cronbach's Alpha	CR	AVE	Convergent Validity (AVE>0.5)		
Attitude	ATT1	0.961		0.969	0.913			
towards Green	ATT2	0.931	0.954			YES		
Homes (ATT)	ATT3	0.974						
	Intention2	0.652		0.853	0.594	YES		
Purchase	Intention3	0.807	0.771					
Intention (PI)	Intention4	0.826	0.771					
	Intention5	0.760						
Perceived	PBC1	0.867	0.777	0.870	0.691	YES		
Behaviour	PBC2	0.751						
Control (PBC)	PBC3	0.869						
	SI2	0.716	0.818	0.869	0.625	YES		
Perceived Self-	SI3	0.793						
Identity (SI)	SI4	0.818						
	SI5	0.820						
Social Pressure	SN2	0.919	0.859	0.888	0.669			
from Family and Friends (SN)	SN3	0.652				YES		
	SN4	0.895						
	SN5	0.747						

Table 2. Assessment of Convergent Validity

*Items Intention1, SII, SNI were deleted due to poor loadings < .708 (Hair et al., 2010, & Hair et al., 2014) *No further deletion of item needed if AVE > .50 (Hair et al., 2014)

HTMT criterion was used to assess discriminant validity [34], as shown in Table 3. The results indicated that discriminant validity was well established. As such, it can be concluded that there was no issue of multi-collinearity between items loaded on different constructs in the outer model. As such, it was appropriate to proceed to structural model assessment so as to test the hypotheses of the study.

Table 3. HTMT Criterion

	ATT	Intention	PBC	SI	SN
ATT					
Intention	0.175				
PBC	0.130	0.683			
SI	0.370	0.407	0.248		
SN	0.121	0.278	0.322	0.328	

Criteria: Discriminant validity is established at HTMT0.85 / HTMT0.90

Structural Model Assessment

A 5000-bootstrap re-sampling of data was conducted to assess the hypotheses of the study [36]. Table 4 displayed the evaluation of path co-efficient, which was represented by Beta values for each path relationship. The results showed that only three out of four hypotheses were supported. Attitudes towards green homes, perceived behavioural control, and perceived self-identity were found to have an influence on intention to purchase green homes among potential homebuyers in Sabah, Malaysia. As such, hypotheses 1, 3 and 4 were supported. As social pressure from family and friends was not found to have a significant effect on intention to purchase green homes, Hypothesis 2 (H2) was thus not supported. Table 4 also displayed the quality of the model. On the hypotheses which were tested to have significant relationships, all were found to have carried moderate effect size. The predictive relevance values for all three dependent variables were larger than 0, indicating that the independent variables were capable of predicting intention to purchase green homes, as signposted by Q^2 using the blindfolding procedure [36].

 Table 4. Path Coefficients and Model Quality Assessment

			<u></u>								
	Beta	S.E.	t-value	p-value	5.00%	95.00%	Decision	f^2	R^2	VIF	Q^2
H1: ATT -> Intention	0.242	0.066	3.666	0.000	0.124	0.330	Supported	0.097	0.467	1.126	0.214
H2: SN -> Intention	0.035	0.058	0.593	0.277	-0.034	0.125	Not Supported	0.002		1.145	
H3: PBC -> Intention	0.484	0.047	10.391	0.000	0.405	0.557	Supported	0.411		1.069	
H4: SI -> Intention	0.378	0.055	6.872	0.000	0.285	0.466	Supported	0.218		1.230	

V. Conclusion

The study and its findings offered exciting insights into the intention to purchase green homes in Malaysia. Despite considering still in its infancy stage, surprisingly, the findings affirmed that the green home concept is an acceptable idea needed to be taken seriously in future house planning among developers. The idea of creating a demand for green homes may seem not sound exhilarating among developers. However, the results clearly pointed out that moving towards environmentally friendly home market is a bright prospect in the years to come. In fact, according to Nielsen Global Online Survey conducted in 2014, revealed that the millennials generation is willing to pay more for products and services that come from companies who are committed to positive social and environmental impact. This study supported most of the proposed hypotheses; attitudes, perceived behavioural control, and perceived self-identity towards the intention to purchase green homes among potential homebuyers except for social norms. Social norms that refer to the social referents such as individual's spouse, family, and peers do not possess the predictive power to influence individual's intention towards the purchasing of green homes [1]. Even though social referents' influence is not significant as a predictor of behavioural intentions, it is positive and significantly correlated with green attitude, perceived behavioural control and perceived self-identity. Evidently, literature has suggested that a strong relationship between subjective norm and intention has been shown in research on green consumer behavior [37].

The more likely the resources and opportunities are readily available, the more likely the home buyers want to purchase green homes. Therefore, the government should allocate more subsidies to the industry that support green products and technologies, to ensure that cost to build green housing can be reduced to create more demand to green housing market, and at the same time attract housing developers to build greener homes concept housing. The government may also want to introduce incentives such as tax exemptions to green home buyers on interest paid on mortgages. Since perceived self-identity is also a significant predictor of behavioural intentions to purchase eco-friendly homes, housing developers may want to create creative promotion concepts and closely related to self-identity of the potential house buyers to build positive attitudes towards green homes concept that could reflect the individualism to those who owns these properties. The government and housing developers should continue promoting the benefits of buying green homes so that these owners could spread the ideas not only to their peers or kids, but also to the community as a whole.

The results also open up the possibility to further investigation using multi-group analysis in order to determine the difference of effect between groups, such as that between gender, ethnicities and generations [38]. The findings offered empirical evidence that the additional perceived self-identity path is an important extension of TPB as it did help to expand the ability of the theory to predict purchase intent towards green homes. Future studies could also consider other potential determinants of intention to purchase eco-friendly homes, such as sustainability, rewards, the reputation of green homes developers, and the individual knowledge of green homes. The continuous energies would extend the existing literature on green homes market, thus help to enhance its development and demand towards green homes market in Malaysia and other emerging markets.

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IOSR Journal of Business and Management (IOSR-JBM) is UGC approved Journal with Sl. No. 4481, Journal no. 46879.

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Business and Management (IOSK-JBM) 20.7 (2018): 58-63.