# Predicting Homebuyers' Intentions of Inhabiting Eco-Friendly Homes: The Case of a Developing Country

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## ABSTRACT:

Malaysian housing developers are still weighing the costs and benefits of building environmentally sensitive homes as many of them are concerned that there is not enough demand for these homes. The objective of this paper is to examine the relative importance of psychosocial, housing and demographic determinants in influencing intention to inhabit eco-friendly homes. The results indicated that a favorable attitude toward environmentally sensitive homes, high control in the ability to purchase sustainable homes, and the role of identification with green consumerism were statistically significant predictors of intention to inhabit such homes. However, social referents' opinion relating to green and sustainable homes was not significantly related to the intention of inhabiting. The findings also indicated that owners of gated-guarded and detached dwellings, monthly household income and higher educational attainment were significantly related to the likelihood of residing in eco-friendly homes. Housing developers should have to take the lead to generate awareness of sustainability of green homes through education because increasing awareness creates demand for eco-friendly homes, which would in turn push house buyers to go green.

**Keywords**: Eco-Friendly Homes, Inhabiting Intentions, Determinants

## INTRODUCTION

The issues of sustainability have become more significant in today's housing market. Housing developers have recognized the growing market demand for environmentally sustainable housing development projects. Malaysian house builders are urged to design houses for sustainable living, and this is in line with the government's efforts to go green. In fact, the Malaysian government has highlighted carbon emission reduction of up to 40 percent of the 2005 levels which were at 187 million tones. As a matter of fact, Malaysia has slowly begun to tread the path of eco-friendly housing (Tan, 2011a).

The construction of green homes is one of the focus areas of sustainable development to improve the quality of living (Tan, 2011a). Houses are considered 'green' when they use environemtnally friendly materials for construction such as recyclable timber products, recyclable roof systems, recyclable kitchen cabinets, certified energy efficient appliances, compact fluorescent lamps and light-emitting diode lighting system. Also, green homes use water conservation devices, solar panels, rainwater harvesting systems, low lighting and electronics consumption and a special design for natural cooling and heating (Toowoomba Regional Coucil, 2010).

While green homes have been constructed by housing developers in the United States, Europe and Australia, it is still at an early stage in Malaysia. Even before sustainable development became the trend in Malaysia, there were some housing developers who took the bold step forward to build eco-friendly homes. In 2007, Ken Holding (one of private housing developers) constructed the country's first green homes, and these achieved the Green Mark Gold standard certification from the Singapore's Building and Construction Authority. Realizing that the country needed its own certification to suit local conditions, the Malaysian government, together with the Association of Architects Malaysia (PAM) and the Association of Consulting Engineers, Malaysia (ACEM) launched the Green Building Index (GBI) to help housing developers and building owners design and construct more sustainable buildings in 2009. Subsequently, Malaysia achieved a milestone toward carbon neutral development when Sime Darby Property launched its Sime Darby Idea House. It was the first time a private housing developer worked hand-in-hand with other solution providers to construct homes that not only comply with the GBI but also minimize their impact on the environment.

Malaysian housing developers are aware of the changing trends happening around the world but they generally think the Malaysian market may not be receptive to such homes. There are only just a few high-end green housing development projects. Most of these homes only cater to the more affluent house buyers who are well acquainted with green development. The greatest challenge in the housing development is that sufficient attention has not yet been given to the mass markets of housings. Housing developers generally think that they have a long way to go before they see the construction of such homes on a wider scale. Additionally, they are still weighing the costs with the benefits of building environmentally-sensitive homes as many are concerned that there is not enough demand for such homes. Despite the potential in the housing market for green homes, very little is known about the inhabiting intention of homebuyers in the Malaysian context. Therefore, this study aims to examine the factors of inhabiting intentions of homebuyers toward green homes and hopes to present valued information to housing developers.

## LITERATURE REVIEW

In order to gauge the willingness of homebuyers to inhabit eco-friendly homes, it is relevant to focus on the underlying mechanism of intent to purchase eco-friendly homes. Among the behavioral decision-making models used to explain intentions, the extended Fishbein-Ajzen model has been shown to provide an excellent framework for identifying predictors of intention. As noted by Ajzen & Fishbein (1980), behavioral intentions are the immediate antecedents to behavior which could lead to a specific outcome, and are therefore seen as the predictor of behavior. The strength of intention as a surrogate measure of future behavior was demonstrated in previous studies (Morwitz et al., 2007). Furthermore, Morwitz et al (2007) showed that purchase intention and actual purchase are positively correlated, particularly for durable goods. In this aspect, measuring intentions to inhabit green homes could be the best predictor in explaining an individual's home choice behavior. Determinants related to intentions to buy often help to explain why some homebuyers are more likely to live in eco-friendly homes as

compare to others. Knowing the fact that the Malaysian government actively promotes green homes, efficient promotion of green homes requires detailed knowledge of buying intentions parameters. Determinants may be significant to inhabiting intentions of eco-friendly homes ranging from psychosocial, housing and socio-demographic variables.

**Psychosocial Factors**

Of consideration throughout the intention literature is that the most common psychosocial variable of behavioral intentions is attitude toward behavior, which refers to the extent to which an individual has a favorable or unfavorable evaluation of the given behavior (Ajzen, 1991; Ajzen & Madden, 1986). Attitudes are a function of salient beliefs about the likelihood of performing a particular behavior. If individuals believe the performance of a specific behavior will lead to a positive outcome, then they will develop a favorable attitude toward the behavior (Ajzen & Fishbein, 1980). In the case of green product purchases, environmental attitudes do have an impact on purchase intentions toward environmentally sound products (Alwitt & Pitts, 1996). Squires et al (2001) further supported the point that individuals who hold environmental attitudes tend to purchase more green products than those without environmental attitudes. It is therefore reasonable to believe that homebuyers hold a positive attitude toward eco-friendly homes because they believe that these homes are designed and constructed by using an environmentally-responsible process that covers the entire life-cycle of a building, from sitting, design, construction, operation and maintenance to renovation and even demolition. Furthermore, these homes may not only reduce the overall impact of the built environment on human health and natural environment, it may also be able to enhance the surrounding and ensure a better quality of life by efficiently using energy, water and other renewable resources and reducing waste, pollution and environmental degradation.

An individual might have a favorable attitude toward buying eco-friendly homes. However, intent to inhabit may be influenced by the person's belief about social referents' perception and opinion related to green homes. As pointed by Ajzen (1991) and Ajzen & Madden (1986), the social pressure to perform or not to perform the behavior according to the perception of other people. The individual's belief about performing the behavior is influenced by social referents such as the individual's spouse, family, or friends agree or disagree with performing a given behavior (Ajzen, 1991). As Oliver and Bearden (1985) explained, behavioral intentions are based on the preferences of the individual's referents and also the individual's desires to act in accordance with these preferences. Thus, the intention of inhabiting eco-friendly homes may depend on the influence of social referents.

The next construct that is examined in this study is the degree of perceived behavioral control. Perceived behavior control refers to an individual's perception of the ease or difficulty of performing the given behavior. Perceived behavioral control is dependent on control beliefs which deal with the presence or absence of requisite resources and opportunities for performing a given behavior (Ajzen, 1991; Ajzen & Madden, 1986). When individuals believe that they have little control over performing the behavior owing

to a lack of requisite resources and opportunities, then their intentions to perform the behavior may not be strong even though they have favorable attitudes and social referents' support concerning performance of the behavior (Madden et al., 1992). The significant relationship between perceived behavior control and purchase intent suggests that if the behavior is not completely determined by the individual's will, then that person will need requisite resources and opportunities to carry over the behavior. The perception about how difficult it is to perform the given behavior is subject to price and availability of that particular product (Ajzen, 1991). In relation to green purchase behavior, price and availability have the potential to limit or even prevent individuals' green purchases. Magnusson et al (2001) and Smith and Paladina (2010) both argued that many individuals consider price to be an important determinant of purchase. For example, price is often perceived to be a major barrier to the purchase of environmentally sound products, such as organic produce (Lea & Worsley, 2005; Magnusson et al., 2001; Michaelidou & Hassan, 2010). Additionally, lack of availability is often cited as a barrier to the purchase of green products (Davies et al., 1995; Lea & Worsely, 2005). Studies have demonstrated that individuals will purchase more green products if these are more readily available (Lea & Worsley, 2005).

As discussed by Sparks and Shepherd (1992), Fekadu and Kraft (2001), Fielding et al (2008) and Nigbur (2010), perceived self-identity may enhance the prediction of behavioral intentions. The variable of perceived self-identity is to measure the role of identification with environmental consumerism. Perceived self-identity refers to the salient aspects of an individual's self-concept toward performing a given behavior (Rise, et al, 2010; Cook et al., 2002). Sparks and Shepherd (1992) stated that individuals' self-concept is defined in terms of the societal roles that they identify with. Individuals buy the products that are congruent with their self-image. When the particular product can fulfil their needs, the choice of that product will reflect their self-identity (Koklic et al., 2009; Oliver & Lee, 2010). In the case of green product purchases, the variable of perceived self-identify is related to how individuals consider themselves as environmentally conscious consumers. As defined by Grunert and Juhl (1995), environmentally concerned consumers are concerned with the production, distribution, use and disposal of products which result in external costs. In the present study, those who identified themselves as environmentally concerned and environmentally conscious consumers were found to have more intentions when compared with those who did not identify with these characteristics (Davies et al, 1995). The expression of perceived self-identity might embody moral and ethical concerns. As pointed by Schifferstein and Oude Ophuis (1998), environmentally sound products, particularly organic produce, is related to an ethical lifestyle sustained by moral beliefs. Previous research has found that organic products buyers are more likely to engage in environmentally friendly and ethical behaviors as compared to conventional products (Michaelidou & Hassan, 2000; William & Hammitt, 2000). Similarly, Honkanen et al (2006) and McEachern and McClean (2002) showed that consumers of organic, free-range, green or health products are motivated by ethical and environmental concerns. Environmentally conscious consumers are likely to have adopted an ethical lifestyle, manifested via a range of behaviors including consumption of environmentally friendly, ethical, fairly-

traded or locally produced products, and pro-environmental behaviors (Brom, 2000; Carrigan et al., 2004).

## Housing Characteristics

Although there are little specific studies in literature to examine the effect of housing characteristics, as defined by types of housing structure and gated-guarded housing, on green homes inhabiting intentions in the Malaysian context. The case seems to be that housing characteristics may lead to buying intentions of eco-friendly homes.

The physical structure of the house could be important in explaining the motivations of green home owning intentions (Tan, 2008). The common types of housing structure in Malaysia are terrace link, semi-detached, detached houses, and high rise apartment. Built-up areas of terrace, semi-detached and detached houses are generally larger than high-rise apartments. Although there are no specific studies in literature that examined the influence of types of housing structure on inhabiting intentions, households who live in semi-detached and detached are expected to influence buying intentions of green housing. More recently, the Malaysian government has taken another step further by requiring owners of semi-detached and detached residential units must put in place a sustainable living features system, such as a system for harvesting rainwater.

A gated-guarded housing community is a closed community where space is privatized and is characterized by security guards controlling an entrance or exit to provide access to one or more smaller residential streets, with the entire development surrounded by a perimeter wall. This community is fully self-sufficient by offering several advantages to its residents such as superior infrastructure, landscaped lung spaces and property management. Furthermore, common areas and amenities within gated-guarded community provide residents with day-to-day activity requirement. It is reasonable to believe that homeowners who live in gated-guarded communities are more likely to own eco-friendly homes. The most prominent underlying reasons why homeowners now want gated-guarded homes are probably because these homes carry the symbol of upper class, wealth and luxury (Tan, 2011b). A house is no longer just a house. It is now described as a lifestyle or space to reflect the homeowner's personality, self-image, and character. Homebuyers want to own quality homes because of the status symbol that goes along with their properties. As a result, the propensity of inhabiting eco-friendly homes is likely higher as this type of dwelling unit could reflect their social status.

## Socio-Demographic Determinants

Many researchers found varying assortment of socio-demographic determinants to be significant to the home owning decision (Fisher & Jaffe, 2003; Tan, 2012). All housing studies found that the decision to homeownership is associated with household income, education, the age of the head of household, marital status and gender. Age, education background and income are components of the life cycle concept. For instance, the increase in the age, level of education and the increase in household income suggest that homeownership rates should have risen (Laakso & Loikkanen, 1995). Additionally,

owner-occupied housing is often of better quality and more expensive than rented housing. As a result, the preference for homeownership is more prevalent among married couples than singles. Married households have significant and positive impacts on the homeownership rate. On the other hand, the decline in the proportion of households headed by women would tend to have decreased the overall homeownership rates. The males are expected to influence the likelihood of homeownership based on the assumption that males have higher disposable income (Coulson, 1999)

There are well established literatures to study socio-demographic determinants relating to the propensity of owing a house. However, to date, less empirical works has been conducted to investigate socio-demographic determinants relating to the intention of inhabiting eco-friendly homes. This paper endeavors to address this literature gap as much of the previous research designed to assess the effects of demographic variables has focused on homeownership preferences. Previous research showed that psychosocial variables toward environmental sound products vary between population subgroups (Michaelidou & Hassan, 2010; Wier et al., 2008). Therefore, it is reasonable to believe that homebuyers' social-demographic variables ought to be taken into consideration in predicting the intention to reside in eco-friendly homes. Hence, in this study, it may be important to investigate the effect of socio-demographic variables on the intention to live in eco-friendly homes. These include gender, age, marital status, educational attainment, household income and whether or not the respondent is a homeowner.

## METHODOLOGY

### The Respondent

The respondents who are eligible to participate in the survey are homebuyers in Johor Bahru, Malaysia. This area is selected in this study because it is the second largest urban area in Malaysia (Rizzo & Glasson, 2011). In this study, the list of respondents was obtained from one of the leading real estate agencies located in Johor Bahru, Johor. The list comprised a total of 2,000 appointment records from January 1, 2008 to December 31, 2010 in Johor Bahru. To collect the survey data, the survey forms were sent to respondents in the list through mail survey or e-mail to determine their intentions to acquire eco-friendly homes. Of 2,000 distributed survey forms, only 250 forms were used for this study.

### Methods

A series of statistical techniques were performed to measure homebuyers' intentions to inhabit eco-friendly homes. First, exploratory factor analysis (EFA) and reliability analysis were used to measure constructs with multiple indicator variables as well as the internal consistency of variables in the study. Confirmatory factor analysis (CFA) was then conducted to assign variables to manifest a construct by determining reliability and validity of the items used. All the items which has been identified as having the

same underlying pattern were grouped together to construct the composite values. In this case the composite indices of psychosocial factors and inhabiting intentions were calculated. Housing and socio-demographic determinants used in this study were measured in a dichotomous code. Finally, regression analysis was performed to estimate the coefficients of psychosocial together with housing and households' socio-demographic determinants on the intention of inhabiting eco-friendly homes.

**Exploratory Factor Analysis (EFA)**

The measures of psychosocial variables were adapted and modified from measures contained in Sparks and Shepherd (1992), Fitzmaurice (2005), Fielding et al (2008) and De Canniere et al (2009) using 7-point scale (1=strongly disagree to 7= strongly agree). Attitudes toward environmentally sensitive homes were measured using eight questions by asking households how they feel about eco-friendly homes (alpha = 0.943). Six social influence questions were asked to ascertain how significant the role of others in relationship to purchasing eco-friendly homes was (alpha = 0.923). Perceived behavior control was measured using five items asking households how confident and easy they felt about their ability to purchase green and sustainable homes (alpha = 0.832). Six questions of perceived self-identify was developed to measure the identification of environmental consumerism (alpha = 0.913). Eight intention questions (alpha = 0.926) were modified from Fielding et al (2008) and Khalil et al (2008).

**Housing and Socio-Demographic Variables Used in this Study**

As indicated earlier, green homes inhabiting intentions may tend to vary by socio-economic status of homebuyers and housing characteristics. Table 1 showed a summary of demographic and housing variables used in the study.

*Table 1: Definition of Housing and Socio-Demographic Variables*

| Variables | Descriptive |
|---|---|
| Home | The respondent is home owner |
| Males | The respondent is male |
| Age < 30 | The age of the respondent is less than 30 (ref group) |
| Age 30 – 45 | The age of the respondent is between 30 and 45 |
| Age > 45 | The age of the respondent is above 45 |
| Primary | The education attainment of the respondent is primary (ref group) |
| Secondary | The education attainment is secondary |
| Tertiary | The education attainment is tertiary |
| Married | The respondent is married |
| < RM 3000 | The monthly income is less than RM 3000 (ref group) |
| RM 3000 – RM 8000 | The monthly income is between RM 3000 and RM 8000 |
| > RM 8000 | The monthly income is more than RM 8000 |
| G & G | The respondent lives in gated-guarded community |
| Apartment | The respondent lives in apartment |

| Terrace | The respondent lives in terrace house |
| Detached | The respondent lives in detached house |
| Semi-detached | The respondent lives in semi-detached house (ref group) |

## Regression Model

In explaining the relationship between the willingness to purchase eco-friendly homes and determinant, the research questions is to assess whether psychosocial, housing and demographic determinants show signs of statistically significant relationship with the likelihood of inhabiting eco-friendly homes in a developing country.

A functional relationship in this study can be represented by:

$$PI_i = \beta_0 + \beta_{ea} EA_i + \beta_{sp} SP_i + \beta_{pbc} PBC_i + \beta_{psi} PSI_i + \beta_h H_i + \beta_d D_i + \varepsilon_i$$

where $\beta_{ea}$ is the coefficient vector for the environmental attributes (EA), while $\beta_{sp}$, $\beta_{pbc}$ and $\beta_{psi}$ are social influences (SP), perceived behavioral control (PBC) and perceived self-identity (PSI) coefficient vectors, respectively, reflecting the psychosocial effects on the intention of inhabiting eco-friendly homes. $\beta_h$ and $\beta_d$ refer to the coefficient vectors of housing (H) and socio-demographic descriptors of respondents (D). $\varepsilon$ is the stochastic disturbance vector.

## RESULTS AND DISCUSSION

## Confirmatory Factor Analysis (CFA)

In order to fully assess the reliability and validity of the item used, confirmatory factor analysis was performed using AMOS. Following Fornell and Larcker (1981), construct reliability (CR) and convergent validity (VE) were tested. As shown in Table 2, the CR and VE for each construct were above 0.7 and 0.5 respectively, suggesting sufficient reliability and validity of the measurement used. Referring to the results from VE, discriminant validity could be measured. Following Fornell and Larcker (1981), the average variance expected (AVE) of the selected two constructs must be more than the square of the correlations between these two constructs. In this study, all AVEs were more than the respective square of correlations. Therefore, the constructs proposed had discriminant validity, indicating that all constructs were distinctive but correlated with one another. Furthermore, the goodness-of-fit indices suggested that the measurement model provided a good model fit according to the usual conventions (normed $\chi^2 = 1.877$, CFI = 0.967, NFI = 0.932, GFI = 0.915, RMSEA = 0.059). There was a clear implication that the latent variables of respective hypothetical concepts were converged in their respective factors. The indicators were then confirmed to manifest a specific construct, where the factor loadings were the highest. Indicators were then omitted from further analysis if they did not show a unique manifestation of a single factor. As a result, 3 indicators of attitude construct, 3 indicators of social referents construct, 2 indicators of perceived behaviour control construct, 4 indicators of self-identity construct, and 5 items of intention constructs were dropped from further analysis respectively. As indicated

earlier, the results from CFA were used to create various composite indices, representing various aspects of psychosocial determinants and inhabiting intentions. For example, the composite index of environmental attitude construct was the average of 5 items, namely B4, B5, B6, B7 and B8. These composite indices together with housing and socio-demographic determinants were used to perform regression analysis.

**Table 2: Psychosocial Variables after Confirmatory Factor Analysis**

| | Construct | L | VE | CR |
|---|---|---|---|---|
| | **Environmental Attitudes (EA)** | | **0.729** | **0.931** |
| B4 | Eco-friendly homes are valuable because these homes are developed and constructed using an environmentally friendly process | 0.825 | | |
| B5 | Eco-friendly homes are sensible because these homes may not have a negative impact on the environment | 0.822 | | |
| B6 | Eco-friendly homes that meet Green Building Index (GBI) standards are favourable | 0.861 | | |
| B7 | Sustainable living features of eco-friendly homes are useful | 0.901 | | |
| B8 | Eco-friendly homes are beneficial because these homes may enhance our quality of life without sacrificing the internal comfort of the occupants | 0.857 | | |
| | **Social Referents (SP)** | | **0.762** | **0.905** |
| C1 | Most members of my family would expect me to own eco-friendly home | 0.822 | | |
| C2 | I intend to follow the advice of my friends that I should own eco-friendly home | 0.901 | | |
| C3 | My friends would recommend that I own eco-friendly home | 0.893 | | |
| | **Perceived Behaviour Control (PBC)** | | **0.591** | **0.813** |
| D2 | I have a great deal of control in terms of resources and opportunities over whether I can own eco-friendly home | 0.768 | | |
| D3 | It is very easy to own eco-friendly home | 0.761 | | |
| D5 | I felt a great deal of confidence about my ability to own eco-friendly home | 0.778 | | |
| | **Perceived Self-Identity (PSI)** | | **0.711** | **0.881** |
| E1 | I think I will engage in environmentally friendly and ethical behaviors owing to moral concerns | 0.819 | | |
| E2 | Engaging in environmental activities is an important part of who I am | 0.884 | | |
| E3 | I think of myself as someone who is very concerned with green issues | 0.826 | | |
| | **Purchase Intention (PI)** | | **0.728** | **0.889** |
| F2 | I am planning to reside in eco-friendly home in future | 0.821 | | |
| F4 | I will try to acquire eco-friendly home in future | 0.880 | | |
| F5 | I will make an effort to own eco-friendly home in future | 0.858 | | |

**Regression Analysis**

As shown in Table 3, two regression equations were presented. The first one was solely based on the effect of psychosocial factors on the intention of inhabiting eco-friendly homes without taking housing and socio-demographic characteristics into consideration, whereas the second equation include housing and socio-demographic determinants as control variables. The results revealed that the explanatory power of the second equation merely increased by 6.7 percent of the variance in intention (Adjusted R-square) as compare to the first one, indicating psychosocial factors influenced more strongly than housing and socio-demographic determinants. In the following analysis, only the results in the second equation were discussed in details.

As expected, environmental attitude toward eco-friendly homes was a statistically significant predictor of intention of inhabiting eco-friendly homes at the 0.01 level, while holding all other variables constant. These results revealed that homebuyers who have more favorable attitudes toward green and sustainable homes have a 21.7 percent higher probability of inhabiting green homes in future, when control for housing and demographic variables. This finding also reinforced the proposition that homebuyers' favorable attitudes toward green housing attributes such as improving air and water quality, protecting biodiversity and the ecosystem, conserving natural resources and reducing energy use with green energy solutions, are likely to intend to live in green homes. In line with the work of Alwitt and Pitts (1996), this finding has supported the attitude-intention relationship, showing that environmental attitudes do have an impact on consumer green buying intentions. Squires et al (2001) also reinforced this that consumers who hold favorable environmental attitudes purchase more environmentally sound products than those without favorable attitudes.

However, this study did not support the relationship between social pressure from others and intentions, holding other things constant. This finding contradicts the previous findings of Ajzen (2002) and Kim and Karpova (2009), which identified social referents' influence as a key predictor for behavioral intentions. Social referents' influence was not a significant predictor of behavioral intentions, suggesting the family and friends' opinions may not have greater impact on the prediction of intention to reside in green homes. In this study, the willingness to live in green and sustainable homes may not be encouraged even if potential buyers perceive that their family and friends support the behavior. This finding is similar to the study of Raisbeck and Wardlaw (2009). They showed that other people's opinions are not a major motivating factor to encourage home builders to build a sustainable home in Australia.

In line with the findings of Fekadu and Kraft (2001), Fielding et al (2008), Nigbur (2010) and Rise et al (2010), individuals are more likely to enact behaviors that they have full control of the behavior. In the case of eco-friendly homes, if homebuyers think they possess resources and opportunities, they are approximately 15.5% more likely to have a higher degree of intent even though they may not think about owning green home. Like most things, efforts toward sustainable development come at a cost. In some areas, the additional cost may be low enough to be manageable, but in other areas, it may

seem exceedingly high and in the end, some of it has to be passed on to homebuyers. As a result, housing builders of eco-friendly homes should be hard-pressed to keep costs down and ensure sustainability in the procurement of raw materials and construction process at the same time.

In this study, individuals who identified themselves as environmentally concerned and environmentally conscious consumers were found to have 19.9 percent more intentions compared to those who did not identify with these characteristics. As shown in Table 4, perceived self-identity influenced inhabiting intentions more strongly than the other 3 psychosocial variables, suggesting homebuyers' environmental concerns have an impact on behavioral intentions toward green and sustainable homes. Previous research showed that consumers of green products were motivated by environmental concerns (Honkanen et al., 2006) and were more likely to engage in a variety of environmentally friendly and ethical behaviors (Williams & Hammitt, 2000; Michaelidou & Hassan, 2010).

As shown in Table 3, the influences of socio-demographic variables were limited. Of family life cycle variables, only monthly household income and households with tertiary education background were statistically significant in this study. The abundant studies that have employed the homeownership models tend to indicate that income appears to be a significant determinant to explain the changes in homeownership. In this study, the monthly income of the household head had significant and positive coefficients and impacts on the propensity of buying eco-friendly homes, all other factors being constant. The result showed that respondents who earned between RM 3, 000 and RM 8, 000, and above RM 8, 000 are 1.53 ($e^{0.425}$) times and 1.52 ($e^{0.419}$) times more likely to reside in eco-friendly homes, respectively. Household income signals the respondent's ability to purchase eco-friendly homes, which reinforce the economic aspect of consumption of green products. In addition to household income, the influence of education attainment of the respondent was an important indicator of buying intentions of eco-friendly homes. Respondents with tertiary education had a stronger intention to purchase eco-friendly homes as many studies confirmed the belief that more highly educated consumers might be more likely to pay for green products. In the present study, the likelihood of buying eco-friendly homes did not differ for the change in tenure status, all other things being equal. Contrary to the finding of Robinson & Smith (2002), marital status and older households were not significant to add to the prediction of intention of environmentally sound product. With regard to male household, it is interesting to notice that the changes in the probability of inhabiting eco-friendly homes are not affected by gender. As pointed by Byrne et al (1992), females might be more likely to purchase green products, such as organic food.

The estimation also showed that holding all the other factors constant, there was a positive relationship between the likelihood of inhabiting eco-friendly homes and households who live in gated-guarded housing scheme, indicating that homebuyers who live in the gated community are 1.45 times ($e^{0.373}$) more likely to to have a higher degree of purchase intent. As noted earlier, purchasing good quality properties is status consumption. Status consumption is the motivational process by which individuals strive

to improve their social standing through conspicuous consumption of products that confer or symbolize status for both the individual and surrounding others (Eastman et al., 1997). In this case, possession of eco-friendly homes may symbolize status that goes along with this type of property, such as social class. Additionally, 1.43 times ($e^{0.360}$) higher willingness to inhabit was observed for owners of detached houses owing to the recent announcement by the government to install sustainable living features in the house.

**Table 3 Regression Results**

|  | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
|  | B | t | VIF | B | t | VIF |
| Constant | 0.186 | 0.515 |  | -0.202 | -0.465 |  |
| EA | 0.384 | 6.478* | 1.316 | 0.283 | 4.456* | 1.703 |
| SP | 0.026 | 0.465 | 1.393 | 0.045 | 0.835 | 1.448 |
| PBC | 0.235 | 4.406* | 1.207 | 0.208 | 3.996* | 1.292 |
| PSI | 0.294 | 5.057* | 1.181 | 0.262 | 4.591* | 1.284 |
| Males |  |  |  | 0.130 | 1.139 | 1.106 |
| Homeowner |  |  |  | 0.104 | 0.804 | 1.243 |
| Age 30 – 45 |  |  |  | 0.180 | 1.319 | 1.644 |
| Age > 45 |  |  |  | 0.176 | 1.114 | 1.603 |
| Married |  |  |  | 0.029 | 0.245 | 1.190 |
| Secondary |  |  |  | 0.079 | 0.486 | 2.030 |
| Tertiary |  |  |  | 0.378 | 2.462* | 2.100 |
| Income 3000 – 8000 |  |  |  | 0.425 | 2.432* | 2.655 |
| Income > 8000 |  |  |  | 0.419 | 2.269* | 2.534 |
| Terrace |  |  |  | 0.013 | 0.092 | 1.601 |
| Semi-detached |  |  |  | 0.022 | 0.135 | 1.528 |
| Detached |  |  |  | 0.360 | 2.141* | 1.568 |
| Gated-Guarded |  |  |  | 0.373 | 3.300* | 1.098 |
| R square | 0.411 |  |  | 0.505 |  |  |
| Adjusted R square | 0.402 |  |  | 0.469 |  |  |
| Std error estimate | 0.88879 |  |  | 0.83719 |  |  |
| F | 42.788 |  |  | 13.943 |  |  |

*$p < 0.05$; Dependent variable: Inhabiting Intentions of Eco-Friendly Homes (PI)

## CONCLUSIONS AND RECOMMENDATIONS

Green homes are not just about the physical house being green. The concept of green homes requires a fundamental shift in attitudes and change in our habits. As shown in the results, a favorable attitude toward eco-friendly homes is a significant predictor of green homes buying intentions. Attitudes put people into a particular of mind liking or

disliking things, and of moving toward or away from them. The more positive or favorable attitude toward green homes, the more likely the person will inhabit these homes.

The results also showed that house buyers are more likely to purchase eco-friendly homes when they have resources and opportunities. In order to increase the accessibility of green and sustainable homes in the market, the government should provide subsidies in some green products and technologies so that the cost of building green housing will be reduced and this, in turn will reduce the price of green and sustainable homes. Furthermore, incentives such as tax exemptions on interests paid on mortgages should be given to house buyers who purchase green and sustainable homes. Malaysia still faces hurdles because some housing developers have concerns that going green is expensive.  It is a common misconception that green design is expensive design. It is very expensive only if developers ignore the climatic and environmental factors which require greater consideration of artificial lighting, cooling and high performance facades. In response to high green development costs, developers should put efforts into fine-tuning the basic design or passive design to reduce reliance on high-technology products since eco-friendly homes do not always require the high-tech gadgetry. For example, passive design reduces heat gain by incorporating high roofs, thinner rooms for better cross-ventilation, low-emission glass, and larger eaves to prevent excessive exposure to sun and rain. Additionally, a house that has the green features of insulated walls, good noise insulation blocks and aerated bricks can help prolong and extend the life of sustainable homes.

Perceived self-identity is another significant determinant of behavioral intentions of purchasing green and sustainable homes. It is advisable for housing developers to use a promotion concept that is related to the expression of self-identity among house buyers. These actions not only build a positive attitude toward green and sustainable homes, but also create the need to reflect their identities by owing them. The government and housing developers need to get house buyers to think about and feel good about their purchases in the hope that green homes will be so healthy and exciting that every house buyer will not want to purchase any other types of housing, Additionally, homeowners may want to own eco-friendly properties that reflect their social status owing to the condition and overall attraction of these properties, particularly homeowners of detached and gated-guarded dwellings.

Answering the green and sustainable call requires a collaborative effort from the different parties (Tan, 2011a). Housing builders should contribute to the efforts by creating awareness through information and education. They should take the lead to raise awareness about the attributes of green and sustainable homes. It is important to raise awareness among the uninformed by increasing the visibility of green homes, and this in turn would then push house buyers to go green.

Although there are many initiatives and programs to promote greater green awareness and practices locally, there is still a need for more practical solutions to be adopted among house builders. The government should look into promoting green practices by

providing guidelines, frameworks and clear policies. Additionally, certain green requirements to be incorporated into the housing development projects should be made mandatory by law and other building legislation.

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